European Network of
Transmission System Operators
for Electricity

NETWORK CODE ON "REQUIREMENTS FOR GENERATORS"

-

EVALUATION OF COMMENTS

26.06.2012

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Disclaimer

This document lists ENTSO-E's assessment of comments provided in the formal web-based consultation on the draft Network Code on "Requirements for Grid Connection applicable to all Generators" (NC RfG) in the period of 24 Jan. – 20 Mar. 2012. Rather than providing responses per individual comment received, an assessment of all input received is done on a clustered basis, e.g. per topic or paragraph, in order to give a coherent view on ENTSO-E's approach towards the final NC RfG.

The Article numbering in this document refers to the Article numbering of the draft code published on 24 Jan. 2012. Where reference is made to the final NC RfG, in case of updated numbering, this is explicitly indicated.

ENTSO-E's assessment of comments is given in two levels. First, for each Article the main issues are summarized and addressed. This is followed by a list of minor issues, mostly slight variations on the main issues, requests for clarifications and editorials. This distinction is based on ENTSO-E's judgment, irrespective of the organization(s) providing the comment nor the number of times it was provided.

In order to provide a clear oversight of comments and responses, the issues mentioned in this document may have been summarized with respect to the original comments provided. For a full overview of all comments provided in the web-based consultation, in their original formulation, please refer to https://www.entsoe.eu/consultations/

This document is not legally binding. It only aims at clarifying the content of the final network code for requirements for grid connection applicable to all generators, based on feedback provided during the formal consultation period. This document is not supplementing the final network code, nor can it be used as a substitute to it.

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RESPONDENTS

The following table lists all respondents who provided comments in the web based consultation. For a full overview of all comments, please refer to https://www.entsoe.eu/resources/consultations/

The respondents are listed in alphabetical order, based on the name of the organization indicated.

Name	*Respondent Organization*
Dr. Britta Buchholz	ABB AG
Miguelangel Sarabia Lopez	ACCIONA
Yves-André Bagnoud	Alpiq Suisse SA
Lara Ferreira	APREN
Geissler Waldemar	Areva
-	Asociacion Empresarial Eolica
Brendan Murphy	Association of Electricity Producers
Antonio Livrieri	Assoelettrica
Florian Maringer	Austrian Wind Energy Association
Karl Diethelm	Axpo AG EGL AG Calenia Energia S.p.A Rizziconi Energia S.p.A. Officine Idroelettriche di Blenio SA Officine Idroelettriche delle Maggia SA Kraftwerke Hinterrhein AG AG Kraftwerk Wägital AG Kraftwerke Linth-Limmern AG Kraftwerke Sarganserland AG Kraftwerke Ilanz AG Kraftwerke Vorderrhein AG Albula-Landwasser Kraftwerke AG Officine Idroelettriche di Mesolcina SA Kraftwerke Mattmark AG Force Motrice Mauvoisin SA Kraftwerk Eglisau-Glattfelden AG Elektrizitätwerke Rheinau AG Kraftwerk Rupperswil-Auenstein AG Kraftwerke Ryburg-Schwörstadt AG
Jaume Alcover	Baxi
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Mike Small	Baxigroup

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Dr. Michael Wunnerlich	BDEW
Christoph Thoma	BDH
Pilar Barrera	BEWAG Netz GmbH
Louis-F. Stahl	BHKW-Forum e.V.
Martin Westrick	BKW FMB Energie AG Gommer Kraftwerke AG Onyx Energie Mittelland AG Electricité de la Lienne SA EWR Energie AG Simmentaler Kraftwerke AG Sol-E Suisse AG Société des Forces Electriques de La Goule SA EW Grindelwald AG Kraftwerke Kander Alp AG Bielersee Kraftwerke AG Kraftwerke Sanetsch AG Kraftwerke Milibach AG
Florian Steinmueller	Bosch KWK Systeme GmbH
Liliane Gasse	Bosch Power Tec
Andre Bott	Bosch Solar Energy AG
Wolfgang Friede	Bosch Thermotechnik GmbH
Wulf Binde	Bundesverband Kraft-Wärme-Kopplung e.V. (B.KWK)
-	Bundesverband Solarwirtschaft
Gert De Block	CEDEC
Jens Erdmann	CENELEC TC 8X
-	Centralschweizerische Kraftwerke AG
James Barrett	Centrica
Antonio Ardito	CESI S.p.A.
Gunnar Kaestle	Clausthal University of Technology
Philippe Courtes	Cofely GDF Suez
Marco Riffelmann	Comuna Metall
Allan Norsk Jensen	Danish Energy Association
Hongfei Ma	DEIF
Diana Craciun	DERlab e.V.
M. Poeller	DIGSILENT GmbH
Jakob Birck Müller	DONG Energy
Siegfried Wanzek	E.On
Martin Frydenlund	EC Power A/S
Josselin Boursier	EdF
John Costa	EdF Energy UK

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Rubén Gutiérrez Otero	EDP Renovaveis
Irina Nikolova	EFET
Dana Popp	EHI - Association of the European Heating Industry
Mike Kay	Electricity North West
Eberhard Fohry	EnBW
Jonathan Härer	EnBW
Javier Meco Geriz	Endesa
Riccardo Lama	Enel Distribuzione
Hans Olav Ween	Energy Norway
Siegfried Wanzek	EON AG
Paul Newton	EON UK
Manoel Rekinger	EPIA
Grainne O'Shea	ESB
Ton Geraerds	Essent Energie b.v.
Jonas Persson	EUR
Pavla Mandatova	EURELECTRIC (DSO)
Giuseppe Lorubio	Eurelectric WG Thermal / VGB Powertech
Paul Zepf	EUROMOT
Florian Boeger	EUTurbines
Paul Wilczek	EWEA
Eric Van Assche	FEBEG
Julian Langstädtler	FGH-MA
Jens Rauch	FGW e.V.
Reijo Manninen	Finnish Energy Industries
Thoralf Bohn	FNN
Hermann Laukamp	Fraunhofer-Institut für Solare Energie Systeme ISE
Stefan Reichert	Fraunhofer-Institut für Solare Energie Systeme ISE
Jose Miguel Miranda	Gamesa Innovation & Technology
David Spillett	GB Distribution Code Review Panel
Marcel Cailliau	GDF Suez
Jose Gomez	GE Energy Gas Engines
Stephan Wachtel	GE Wind Energy
Stephanie Ropenus	German Wind Energy Association (BWE)
Chris Yates	HHIC
Jens Paetzold	Hochschule Ruhr West
Laura Rol	Iberdrola
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Jochen Moeller	M.O.E. Moeller Operating Engineering GmbH
Johan Bergerlind	Mälarenergi Elnät AB
Eckard Quitmann	Enercon
Dave Clark	Microgen Engine Corporation
Marcus Mücke	MTU Onsite Energy GmbH
Assiet Aren	MWM
Alan Creighton	Northern Power Grid
John Glavin	Nuclear Power
T. Mueller	OESTERREICHS E-Wirtschaft Erzeugung
Gert Pascoli	Österreichs E-Wirtschaft
-	Polish Power Transmission and Distribution Association
Bengt-Arne Walldén	Pulp and paper industry
Joe Duddy	Renewable Energy Systems Ltd.
Zoltan Zavody	RenewableUK
Georges Marquart	REPOWER
Inga Skrypalle	REpower Systems SE
Joachim Zey	Robert Bosch GmbH
Britta Johnig	RWE AG
Daniel Gronert	RWE Deutschland
Agnieszka Maciejko	RWE Stoen Operator Sp. z o.o.
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Dietmar Weisenberger	SenerTec GmbH Schweinfurt
Mauro Grecchi	SenerTec Italy
Frank Martin	Siemens Wind Power
Lina Palm	SKGS
Bernhard Ernst	SMA Solar Technology
Norman Granson	SOKRATHERM GmbH
Garth Graham	SSE Generation Ltd
Sten-Olov Gradin	SSG Standard Solution Group
Mattias Wondollek	Svenskvindenergi
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Beat Moser	Swisselectric
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WHERE-AS

Many comments, attributed to no specific Article, gave general comments or referred to cover letters with no link to a specific clause of the draft code published for consultation. No specific responses are given on these comments in this document. Some comments, attributed to no specific Article, referred to the where-as section of the draft code. It is noted that this section is only descriptive in nature and not legally binding.

Issue	**Responsibility of TSO for frequency control and system stability**
Section	Whereas 2
Proposal	Addition with "TSOs have therefore the right to set requirements for their networks and all frequency related issues in the European wide connected electrical system."
Evaluation	Agree
Justification	Additional reference to Article 2 of Directive 2009/72/EC in recital (2) was added to have additionally the better description of the role of a TSO

Issue	**DSO's should have the right to set requirements in respect to voltage stability but not for frequency**
Section	Whereas 2
Proposal	Addition with "DSOs have no right to set requirements for frequency related issues in the Europe wide connected electrical system."
Evaluation	Disagree
Justification	The rights of a DSO are inherent in Article 25 of Directive 2009/72/EC.

Issue	**Aside the network safety also the safety of generators, persons and environment are important**
Section	Whereas 5
Proposal	Additions to state the responsibility of generators for their security and contributing to system stability
Evaluation	Disagree
Justification	Secure system operation already includes generator security; this includes nuclear safety for nuclear generators. Environment is included in recital (1) as "with due regard to the environment"

Issue	**A common understanding takes into account the interests of the network as well as those of the generating units.**
Section	Whereas
Proposal	Additions to give more importance to the common understanding for taking into account the interests of the generators as well as these of the network
Evaluation	Disagree
Justification	Focus is already on cooperation of generators with Network Operators, not only TSO's.

Issue	**Optimization of the complete system only takes place if both systems (network and generators) are balanced**
Section	Whereas 4

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Proposal	Addition of “and it should be taken into consideration, that the security of each system (network or generation) is interdependent on the other.”
Evaluation	Agree
Justification	Clarification of the interdependencies introduced.

Issue	**Cost efficiency, market based allocation of ancillary services**
Section	Whereas 4 and Whereas in the end
Proposal	Additions that ancillary services should take place under market-based rules and allocation
Evaluation	Disagree
Justification	Cost effectiveness is already included in the terms "Effective competition" and "the efficient functioning of the internal" market as well.

Issue	**The principle of subsidiarity should be given less weight than non-discrimination etc.**
Section	Whereas 5
Proposal	Addition of “Such principles shall prevail over the subsidiarity principle”
Evaluation	Disagree
Justification	The global subsidiarity principle does not affect the other principles mentioned in recital (5).

Issue	**Too wide definition of „cross-border”**
Section	Whereas 6
Proposal	Limitation of the definition
Evaluation	Disagree
Justification	The existing wording follows Regulation (EC) 714/2009 and gives guidance for a common understanding within this Network Code.

Issue	**System security can only be ensured by TSO and DSO together**
Section	Whereas 6
Proposal	Naming also DSO’s together with TSO’s
Evaluation	Partially agree
Justification	In Whereas (4) already is mentioned, that system security is only possible by close cooperation of Power Generating Facilities and Network Operators (TSO and DSO).

Comment	***assessment***	***Response***
The increasing role of the DSO's should be better described.	agree	Additional reference to Article 2 and 25 of Directive 2009/72/EC in whereas (3) was added.
The cooperation between generators and system operators should not necessarily follow the confidentiality principle. Suggest just torefer to art. 4(3) (generic clause).	disagree	Confidentiality is very important for the cooperation between Network operators and generators. This means not, that a generator or a network operator can keep private information needed for the cooperation.

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The NC can only require a generator to "provide" something when an agreement has been made (and the costs are covered).	disagree	Without meeting the technical requirements, the generator will not be connected to the grid. This requirement is a condition for the network operator to conclude the grid connection contract with the Power Generating Facility.
The TSOs should have better possibilities to decide on transmission related matters	disagree	TSO has the possibilities stated in Directives to decide on transmission related matters.
The reference to "standardization" shall be deleted as the standards does not fulfil the legal requirements of a NC (our of scope)	agree	… and to achieving cost efficiencies through **harmonization of requirements** shall be regarded ….

ARTICLE 1 – SUBJECT MATTER

Comments attributed to Article 1 covered mainly general statements and/or cover letters.

Issue	**Obligations for TSOs**
Section	Article 1
Proposal	Inclusion of responsibilities to system operators for system security
Evaluation	Partially agree
Justification	In the context of this Network Code the responsibility of Network Operators to make appropriate use of PGF capabilities is added.

ARTICLE 2 – DEFINITIONS (GLOSSARY)

Issue	**Clarification on definitions of Generating Unit – Power Park Module – Power Generating Facility**
Section	Article 2
Proposal received	Definitions need to be clarified to avoid confusion on when requirements are applicable to the unit and when to the PPM. The definition needs to be improved on the following topics • What is an „indivisible set of units“? • Is a DFIG a PPM or a synchronous generator? • No definition exists of generator or alternator.
Evaluation	Agree
Justification	At the moment most national codes use a different terminology on what a unit, a plant, a generator or a module is. In addition some codes set requirements at the level of the Generating Unit, some at the level of the Power Generating Facility. Misinterpretations are likely to happen and should be avoided. For this reason the term Generating Unit is replaced by ***Power Generating Module*** which is either a • *Synchronous Power Generating Module, or*

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	• *a Power Park Module.* *a **Synchronous Power Generating Module** is an indivisible set of installations which can generate electrical energy. It is either a* • *a single synchronous unit generating power within a Power Generating Facility directly connected to a transmission, distribution or closed distribution Network, or* • *an ensemble of synchronous units generating power within a Power Generating Facility directly connected to a transmission, distribution or closed distribution Network with a common Connection Point, or* • *an ensemble of synchronous units generating power within a Power Generating Facility directly connected to a transmission, distribution or closed distribution Network that cannot be operated independently from each other (e. g. units generating in a combined-cycle gas turbine facility), or* • *a single synchronous storage device operating in electricity generation mode directly connected to a transmission, distribution or closed distribution Network, or* • *an ensemble of synchronous storage devices operating in electricity generation mode directly connected to a transmission, distribution or closed distribution Network with a common Connection Point.* ***Power Park Module (PPM)** - any unit or ensemble of units generating electricity, which* • *is connected to the Network non-synchronously or through power electronics, and* • *has a single Connection Point to a transmission, distribution or closed distribution Network.* The definition of PPM is adapted to clarify that DFIGs are considered as PPMs. A definition of ***Alternator*** is added as „*a device that converts mechanical energy into electrical energy by means of a rotating magnetic field*“. Typical schemes to clarify the concept of a Power Generating Module versus Power Park Module, are introduced in the FAQ document. This FAQ also covers the concept of privately owned lines and aims at clarifying the sometimes noted ‚legal gap‘ of responsibility between the connection point and the generator itself. In the case of doubt, clarification on responsibility or the connection point are part of the connection agreement (as referred to in the definition of Connection Point).

Issue	**„Frequency“ new definition**
Section	Article 2 – Definitions (Glossary)
Proposal	Definition needs to be added in order to cope to requirements regarding response to frequency events. *Frequency - of an electrical signal in a Network is the number of cycles per time unit at a specific location in the Network. The Frequency shall be obtained based on measured signals using a time filter. Regarding the measurement of the fundamental frequency (50Hz) the time filter should be 100ms. The Relevant Network Operator in coordination with the Relevant TSO shall have the right to adopt a decision pursuant to Article 4(3) defining a different filter time constant.*
Evaluation	Partially agreed – new definition added
Justification	The following definition is added to the glossary (in line with the ENTSO-E Glossary / UCTE operational handbook)

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	Frequency - is the Frequency of the electrical power system that can be measured in all network areas of the synchronous system under the assumption of a coherent value for the system in the time frame of seconds (with minor differences between different measurement locations only); its nominal value is 50 Hz.

Issue	**„Momentary Power“ new definition**
Section	Article 2 – Definitions (Glossary)
Proposal	„Momentary Power“ definition needs to be added
Evaluation	Disagree
Justification	No new definition is not added since there is not any requirement related to Momentary Power. This notion is referred to by ‚Active Power output‘, e.g. in requirements on FSM or LFSM.

Issue	**„Power Generating Facility Operator“ new definition**
Section	Article 2 – Definitions (Glossary)
Proposal	„Power Generating Facility Operator“ definition needs to be added
Evaluation	Disagree
Justification	The reference to Power Generating Facility Operator was made twice in the code in Articles 8 and 54. The reference is replaced by Power Generating Facility Owner. In the implementation of this network code is up to the owner whether the requirement is delegated to the operator.

Issue	**„Maximum Capacity“ definition**
Section	Article 2 – Definitions (Glossary)
Proposal	The definition needs to be improved on the following topics: • Add the definition of P_{max} , since it was missing. • Consider that Maximum Capacity is related to normal weather conditions
Evaluation	Partially agreed
Justification	The definition is modified as follows by considering ambient/operational conditions to be covered by the Connection Agreement.: **Maximum Capacity** - the maximum continuous Active Power which a Power Generating Module can feed into the Network as defined in the Connection Agreement or as agreed between the Relevant Network Operator and the Power Generating Facility Owner. It is also referred to in this Network Code as P_{max}.

Issue	**1 pu definition**
Section	Article 2 – Definitions (Glossary
Proposal	Proposals for revising the 1pu definition: - To be set at national level pursuant to Art 4(3) - Take 380kV as reference for 400kV grids - Provide a table of pu references for lower voltage levels
Evaluation	Disagree

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Justification	In the context of this code, the setting of the nominal system voltage is not a decision to be taken, nor is it relevant to provide a complete overview of all presently applicable voltage levels. The use of 400kV as reference in 380kV is part of ongoing harmonization/integration of the European electricity system.

Issue	**„Black Start Capability“ Definition**
Section	Article 2 – Definitions (Glossary)
Proposal	In the Black Start Capability, it should be permitted to use a main energy source (e.g. gas) which is external to the Power Generating Facility. The main issue is that the Power Generating Facility starts without resorting to the power grid.
Evaluation	Partially agree
Justification	The definition was improved. It is specified that the Black Start Capability is the capability of recovery of a Power Generating facility from a total without any energy supply which is external to the Power Generating Facility. An external gas supply is not considered a reliable supply in case of a black out or other severe grid incident. On site energy supplies are allowed.

Issue	**„Block Loading“ Definition**
Section	Article 2 – Definitions (Glossary)
Proposal	A revised definition is proposed to specify that blocks of load, instead of generating power are aimed at.
Evaluation	Partially agreed
Justification	The notion is agreed on. Rather than revising the definition, it is removed as it is not used anymore in the code.

Issue	**„Cost-Benefit Analysis“ Definition**
Section	Article 2 – Definitions (Glossary)
Proposal	A precise definition of Cost-Benefit Analysis is required in the context of Retro-active application and derogation procedures.
Evaluation	Agree
Justification	The following definition is added: ***Cost-Benefit Analysis*** *– is a process by which the Relevant Network Operator weighs the expected costs of alternative actions aiming at the same objective against the expected benefits in order to determine the alternative with the highest net socio-economic benefit. If applicable, the alternatives include network-based and market-based actions.*

Issue	**„Connection Point“ Definition**
Section	Article 2 – Definitions (Glossary)
Proposal	The definition of Connection Point is an unclear definition, therefore a high risk of inadequate definitions for requirements to be proven at the Connection Point is possible (‚legal gap‘). Several proposals for Connection Point are provided: • the point defined by the Relevant DSO or TSO at which the Power Generating Facility is connected to his Network; • the location at which the Power Generation Facility is connected to a Network as

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	defined in the Connection Agreement; • the point at which the Power Generating Facility connects to a Network operated by a TSO or DSO. If a Power Generating Facility is embedded in a private network, such as an industrial network, the Connection Point(s) shall be defined by the Relevant Network Operator; • the point at which the Generating Unit is connected to a Network operated by a TSO or DSO; • the location at which the Power Generation Facility is connected to a Network as defined in the Connection Agreement; • is the location at which the Generating Unit is connected to a public or private network as may be defined in an agreement between the Generating Facility Owner and the Relevant Network Owner or as defined in a decision by the Relevant Network Operator puruant to Article 4(3); • is the location at which the Power Generating Facility is connected to a public network.
Evaluation	Partially agree
Justification	The Connection Point Definition is improved by clearly referring to 1) the Connection Agreement 2) the interface, not a geographical location, and 3) the possible network connections, including Closed Distribution Networks (which does not cover all possible private lines): ***Connection Point*** *- is the interface at which the Power Generating Module is connected to a transmission, distribution or closed -distribution network according to Article 28 of Directive 2009/72/CE as defined in the Connection Agreement.* Further clarification is given in a dedicated FAQs where specific possible case are illustrated and described.

Issue	**„Offshore Connection Point“ Definition**
Section	Article 2 – Definitions (Glossary)
Proposal	A new definition for Offshore Connection Point is proposed **Offshore Connection Point** - is the location at which the Generating Unit is connected to a public or private network Offshore. The ownership boundary of an Offshore Connection Point is subject to agreement between the Generator and the Network Owner, according to the requirements of the Member State and pursuant to Article 4 (3). An offshore connection point requires a separate definition due to some arrangements in force in some member states.
Evaluation	Agree
Justification	Article 18.2 states: „The Offshore Connection Point of an Offshore Power Park Module shall be defined by a decision of the Relevant Network Operator pursuant to Article 4(3).“ For the avoidance of doubt a definition is added as „*a Connection Point located offshore*.“

Issue	**„Pump Storage“ Definition**
Section	Article 2 – Definitions (Glossary)
Proposal	A definition of Pump Storage needs to be added
Evaluation	Agree

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Justification	The following definition is added: ***Pump-Storage*** *– is a hydro unit in which water can be raised by means of pumps and stored, to be used later for the generation of electrical energy*

Issue	**„Manufacturer's Data and Performance Type Certificate (MD&PTC)" Definition**
Section	Article 2 – Definitions (Glossary)
Proposal	More clarification is required on the operational notification process for small mass-market generation.
Evaluation	Agree
Justification	The MD&PTC is renamed as Equipment Certificate and redefined as *„a document issued by an Authorised Certifier for equipment used in Power Generating Modules confirming performance in respect of the requirements of this Network Code. In relation to those parameters, for which this Network Code defines ranges rather than definite values, the Equipment Certificate shall define the extent of its validity. This will identify its validity at a national or other level at which a specific value is selected from the range allowed at a European level. The Equipment Certificate can additionally include models confirmed against test results for the purpose of replacing specific parts of the compliance process for Type B, C and D Power Generating Modules. The Equipment Certificate will have a unique number allowing simple reference to it in the Installation Document."* Other relevant definitions are introduced which are referred to in the operational notifcation articles: • Authorised Certifier • Installation Document • Power Generating Module Document • Statement of Compliance

Issue	**„Minimum Regulating Level" Definition**
Section	Article 2 – Definitions (Glossary)
Proposal	The Minimum Regulating Level should be defined by the Power Generating Facility Owner.
Evaluation	Partially agreed
Justification	Knowledge of the PGF Owner is needed for setting this level. The definition is improved as follows: ***Minimum Regulating Level*** *- is the minimum Active Power as defined in the Connection Agreement or as agreed between the Relevant Network Operator and the Power Generating Facility Owner, that the Power Generating Module can regulate down to and can provide Active Power control.* Note that in the context of reactive power requirements a different term ("Minimum Stable Operating Level") has been introduced which refers to stable operation for unlimited time.

Issue	**„Network and Network Operator" Definition**
Section	Article 2 – Definitions (Glossary)
Proposal	The definition of Network Operator should be made more strict to clarify it only applies to a TSO or DSO.
Evaluation	Disagree

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Justification	The definition is revised to clarify that the definition of Network Operator applies also to the operator of a Closed Distribution System, defined in line with Art. 28 of Directive 2009/72/EC

Issue	**„New Generating Unit / Existing Generating Unit“ definition**
Section	Article 2 – Definitions (Glossary)
Proposal	A Generating Unit is to be considered a New Generating Unit if no final binding contract for the main plant is provided at the date the code applies (instead of when in enters into force) to allow for a sufficient transition period for the industry to adapt
Evaluation	Partially agree
Justification	For many requirements a national implementation of specific parameters, conditions, agreements, etc... (referred to as Art 4(3)) is needed after the code enters into force. It is acknowledged that the design/engineering phase of a new project requires this information. A transition period of two years after the entry into force is introduced in the definition of New Power Generating Module, as well as in the related clauses in Art 3 **New Power Generating Module** – a Power Generating Module for which • with regard to the provisions of the initial version of this Network code, a final and binding contract of purchase of the main plant has been signed after the day, which is two years after the day of the entry into force of this Network Code, or, • with regard to the provisions of the initial version of this Network code, no confirmation is provided by the Power Generating Facility Owner, with a delay not exceeding thirty months as from the day of entry into force of this Network Code, that a final and binding contract of purchase of the main plant exists prior to the day, which is two years after the day of the entry into force of this Network Code, or, • with regard to the provisions of any subsequent amendment to this Network Code and/or after any change of thresholds pursuant to the re-assessment procedure of Article 3(6), a final and binding contract of purchase of the main plant has been signed after the day, which is two years after the entry into force of any subsequent amendment to this Network Code and/or after the entry into force of any change of thresholds pursuant to the re-assessment procedure of Article 3(6).

Issue	**„Onshore Grid Interconnection Point“ definition**
Section	Article 2 – Definitions (Glossary)
Proposal	There is not any reason to relate the Onshore Grid Interconnection to one class of generator (i.e. Power Park Module). The Responsible Network Operator should be replaced by Relevant Network Operator.
Evaluation	Agree
Justification	The definitions of Offshore Connection Point, Offshore Grid Connection System, Offshore Power Park Module, Onshore Grid Interconnection Point have been improved.

Issue	**„Secured Fault“ definition**
Section	Article 2 – Definitions (Glossary)
Proposal	The following definition is proposed: **Secured Fault** - a Secured Fault is defined as a fault, which is successfully cleared in accordance with the requirements for network protection with state-of-the-art equipment to minimise fault ride through requirements for Power Generating Units as published by ENTSO-E.

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	In order to prevent poor quality of grid protection resulting in extreme Fault Ride Through requirements, ENTSO-E shall publish requirements for network protection with state-of-the-art equipment to minimise fault ride through requirements for Power Generating Units. A secured Fault shall be successfully cleared within these requirements.
Evaluation	Disagree
Justification	The Network protection scheme is defined by the Network Operator in order to guarantee the overall security of supply and safety of the Network itself. Minimization of FRT requirements is not the sole objective of the protection scheme. Moreover, Art. 4(1) already states „The requirements established in this Network Code and their applications are based on the principle of non-discrimination and transparency as well as the principle of optimisation between the highest overall efficiency and lowest total cost for all involved parties.“ Therefore, the „Secured Fault“ definition is not revised.

Issue	**„Short-Circuit Ratio“ definition**
Section	Article 2 – Definitions (Glossary)
Proposal	A proposal is made to delete the definition, since it is an internal parameter of a generator, in accordance with the relevant IEC standard, and it is not usually measurable at the connection point. It should not be used to specify required functional performance at the connection point.
Evaluation	Agree
Justification	The definition as well as the related type B compliance test have been deleted as there is no clear link with a specific requirement in the final network code.

Issue	**„Transient Stability“ definition**
Section	Article 2 – Definitions (Glossary)
Proposal	Proposal to delete the definition, since it is not used in The Network Code .
Evaluation	Agree
Justification	The Transient Stability Definition is deleted.

Issue	**„Active Power“ and „Apparent Power„ definitions**
Section	Article 2 – Definitions (Glossary)
Proposal	Specify that Active and Apparent Power need to be considered at fundamental Frequency.
Evaluation	Agree
Justification	Fundamental frequency is included in the definitions of Active Power, Apparant Power, Current, Reactive Power, Voltage

Issue	**„Compliance Monitoring“ definition**
Section	Article 2 – Definitions (Glossary)
Proposal	Specify that Compliance Monitoring is related to the specification and requirement included in the Network Code
Evaluation	Agree
Justification	The definition is modified accordingly

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Issue	**„Compliance Testing“ Definition**
Section	Article 2 – Definitions (Glossary)
Proposal	A proposal is made to improve the definition since several requirements apply to Generating Units and not for the whole Power Generation Facility.
Evaluation	Agree
Justification	The definition is modified accordingly.

Issue	**„Connection Agreement“ definition**
Section	Article 2 – Definitions (Glossary)
Proposal	Replace Power Generating Facility with Power Generating Facility Owner due to the fact that Network Operator and Power Generating Facility Owner are contractual partners, while the Power Generating Facility is not legal person.
Evaluation	Agree
Justification	The definition is modified accordingly.

Issue	**„Control Area“ definition**
Section	Article 2 – Definitions (Glossary)
Proposal	Proposal to revise the definition as follows: **Control area** : A control area is a coherent part of an interconnected electricity transmission system (usually coincident with the territory of a company, a country or a geographical area, physically demarcated by the position of points for measurement of the interchanged power and energy to the remaining interconnected network), operated by a single TSO, with physical loads and controllable generation units connected within the control area
Evaluation	Disagree
Justification	The detail of the proposed definition does not give added value to the requirements in the Network Code

Issue	**„Droop“ definition**
Section	Article 2 – Definitions (Glossary)
Proposal	A proposal is made to improve the definition, relating the droop with the steady state of change of Frequency to the steady state change in power output, since the steady state change of speed refers only to synchronous generators. Moreover respondents propose to add a new definifion for Quasi-Droop, in order to allow a cluster of generators the possibility to adjust power output in a probabilistic manner according to a droop curve (eg. In LFSM-O)
Evaluation	Partially agree
Justification	The definition of Droop is improved by deleting the relation to the speed of a machine: ***Droop*** *- is the ratio of the steady state change of Frequency (referred to nominal Frequency) to the steady state change in power output (referred to Maximum Capacity).* No formulas are introduced in the code. The definition of **Quasi-Droop** is not added. A stochastic LFSM-O requirement which may be relevant in the context of retrofitting, is not considered a forward looking requirement for new units to be designed by industry.

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Issue	**„Energisation Operational Notification (EON)“ Definition**
Section	Article 2 – Definitions (Glossary)
Proposal	Add the possibility of a temporary EON, which may be issued in case of necessity to perform field compliance tests (ION etc).
Evaluation	Disagree
Justification	The possibility of energizing the internal network by using the grid connection in order to perform field compliance tests is not excluded by the current EON definition. Therefore, temporary EON is not added in the definition. In addition is to be noted that the whole Operational Notification procedure has been streamlined because of which there is no seperate EON phase for type A-B-C Modules.

Issue	**„Excitation System“ and „Excitation“ Definition**
Section	Article 2 – Definitions (Glossary)
Proposal	Specify in the definition that the Excitation System is used only in synchronous generator.
Evaluation	Agree
Justification	The Exitation System definition is revised by clarifying it applies only to synchronous electrical machines. As a defined term it is only referred to in a requirement for type D Synchronous Power Generating Modules on voltage stability. The definition of „Exciter“ is deleted due to simplification of the related requirements.

Issue	**„Interim Compliance Statement“ Definition**
Section	Article 2 – Definitions (Glossary)
Proposal	Proposal to delete the definition
Evaluation	Agree
Justification	The definition and its only reference in the Network Code (Article 26.3.a) are deleted.

Issue	**„Island Operation“ Definition**
Section	Article 2 – Definitions (Glossary)
Proposal	Stakeholders propose to modify the definition as follows: **Island Operation** - independent operation of a whole or a part of a Network that is isolated after its disconnection from the interconnected system, having at least one Generating Unit stable supplying power to this Network and controlling the frequency and voltage, due to the following reasons: A) A whole Network can be isolated from the interconnected system, not only a part B) Not all Generating Units equipped with a speed control can generate electricity in an isolated network and Generating Units without any speed control and safely supply power to an isolated Network. Therefore the qualifiying characteristics shall be changed C) Operating a Generating Unit does not necessarily mean that the plant generates electrical power
Evaluation	Agree
Justification	The Island Operation definition was updated accordingly by replacing the „ability to control speed“ by „supplying power to this Network and controlling the Frequency and voltage“

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Issue	**„Limited Active Power Control Mode“ Definition**
Section	Article 2 – Definitions (Glossary)
Proposal	Add a new definition, since a requirement is reported in Article 39.2
Evaluation	Partially agree
Justification	Article 39.2 was updated in order to require Compliance test for Type C Power Park Modules accordingly to the requirement set in Article 9.2.a. The term „Limited Active Power Control Mode“ is as such not needed as a defined term.

Issue	**„Ancillary Services“ Definition**
Section	Article 2 – Definitions (Glossary)
Proposal	Proposal to add a definition in line with ACER’s FWGL
Evaluation	Disagree
Justification	The Framework Guidelines covers several Network Codes, therefore it is not necessary to add the definition just because it is included in the FWGL. Moreover, as reported in FAQ12, the Network Code does not define any requirements specifically for Ancillary Services.

Issue	**„PSS“ Definition**
Section	Article 2 – Definitions (Glossary)
Proposal	Propose to modify the definition as follows: **Power System Stabilizer (PSS)** - is an additional functionality of the AVR in **rotating machinery** with the purpose of damping power oscillations. The definition is not applicable to all kind of generators. For example for PPM it is not possible
Evaluation	Agree
Justification	The definition was update as follows: ***Power System Stabilizer (PSS)*** *- is an additional functionality of the AVR of a Synchronous Power Generating Module with the purpose of damping power oscillations*

Issue	**Relevant Network Operator / DSO / CDSO / TSO**
Section	Article 2 – Definitions (Glossary)
Proposal	Clarification is asked for in several comments: - The definition should refer to the Facility rather then the Unit; - The RNO definition is to be restricted to TSO and DSO.
Evaluation	Disagree
Justification	The operator of a closed distribution system can as well be a RNO. This is also in line with the definitions of Network and Network Operator. The definition refers to the Unit (Module), not the Facility, as this is also referred to in the Connection Agreement and is a relevant reference in the context of this Network Code.

Issue	**„Significant Generating Unit“ Definition**
Section	Article 2 – Definitions (Glossary)
Proposal	Some general comments are made on the application of this term in the code. Other comments

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	ask to delete the reference to the criteria in Art 3(6)
Evaluation	Disagree
Justification	The link to Art 3(6) is considered essential as it specifies the graded approach introduced in this Network Code for Significant Users. The definition is not black/white. A user is to be considered significant or not in the context of a specific requirement, which results in four types of Modules for which a more or less incremental set of requirements applies from A to D.

Issue	**„Slope“ Definition**
Section	Article 2 – Definitions (Glossary)
Proposal	Proposals are made to add the formula for Slope, for the avoidance of doubts
Evaluation	Partially agree
Justification	No formulas are included in the code. The definition for Slope is clarified as follows: ***Slope*** *- is the ratio of the change in Voltage, based on nominal Voltage, to a change in Reactive Power infeed from zero to maximum Reactive Power, based on maximum Reactive Power.*

Issue	**„Speed Control“ Definition**
Section	Article 2 – Definitions (Glossary)
Proposal	Stakeholder propose to specify in the definition that the Speed Control is a capability of synchronous generators only.
Evaluation	Agree
Justification	The definition is deleted, since it was not used in the Network Code anymore. The concept is covered by a more generalized definition of Frequency Control: *the capability of a Power Generating Module to control speed by adjusting the Active Power Output in order to maintain stable system Frequency (also acceptable as speed control for Synchronous Power Generating Modules)..*

Issue	**„Steady State Stability“ Definition**
Section	Article 2 – Definitions (Glossary)
Proposal	To be specified that it refers to Synchronous Power Generating Modules only
Evaluation	Disagree
Justification	As the term is no longer used in the code, the definition has been removed.

Issue	**„Synthetic Inertia“ definition**
Section	Article 2 – Definitions (Glossary)
Proposal	Definition needs clarification
Evaluation	Agree
Justification	The definition is revised to make clear it is a capability of a Power Generating Module, not the Facility and is only relevant for a PPM.

Issue	**„U - Q/Pmax profile“ definition**
Section	Article 2 – Definitions (Glossary)
Proposal	The definition is to refer to the Connection Point, not the HV side of a step-up transformer.

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Evaluation	Agree
Justification	The definition is revised. Additional compensation for specific connection schemes may still be required as prescribed in the relevant articles on reactive power capabilities.

Issue	**Proposals for new definitions**
Section	Article 2 – Definitions (Glossary)
Proposal	Various suggestions have been made for new definitions, for various reasons: Active Power Range, Crossborder Issue, AVR, Instruction, Internal Network, European Standard.
Evaluation	Disagree
Justification	These suggestions have not been agreed on as these bring no added value to the requirements prescribed in the code, or if the notion of relevance is already given in the relevant requirement without the need for a defined term.

ARTICLE 3 – SCOPE

Issue	**Scope comments**
Section	Article 3.1
Proposal	Various suggestions have been made to specify the general scope outline „The requirements set forth by this Network Code shall apply to New Generating Units unless otherwise provided in this Network Code“ by referring to a.o. market procedures, CBAs, environmental constraints, safety issues, etc...
Evaluation	Partially agree
Justification	A clarification has been made that the requirements in this code shall apply „to New Power Generating Modules which are significant according to the provisions of this Network Code unless otherwise provided in this Network Code.“ No exemptions for specific technologies have been introduced in this code, maintaining a technology-neutral approach. Possible exemptions have been introduced on site-specific use of the generation in Art 3(6)g-h for CHP units with rigidly couples steam production and critical loads with sensitive production processes. Other specific situations, such as that of emergency generators, technical constraints on aeroderivative gas turbines, usage of heat demand, etc... are referred to the derogation procedure if needed. No specific environmental/safety constraints have been listed as these are assumed to always apply. Moreover, listing a boundary conditions creates a risk for those which have not been mentioned explicitly. Also it has to be noted that this code covers connection requirements which are dealt with in a design phase, not operational conditions.

Issue	**Application to Existing Power Generating Modules**
Section	Article 3.2
Proposal	Various comments are given on the application of requirements to Existing Users of wich the prominent ones are: - A possibility to reassess the application to Existing Users regularly, but not more often

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	than once every three years, is considered to be too short, taking into account maintenance and modification cycles. - The need for CBAs and non-discrimination across Europe are stressed, urging for transparancy by ENTSO-E and indicating the role of ACER.
Evaluation	Partially agree
Justification	A clear transparent process on retro-active application of requirements has been put forward (with some revisions) in Art 32. The timeframe of three years is in line with ACER's framework guidelines on reassessment of the significance test. The introduction of a minimum time period is to give a minimum assurance to PGF owners. For clarification it is stressed that the three year time period only counts after an earlier proposal has been made to the NRA which is the last stage of the process described in Article 32. In case retro-active application is pursued, still the whole process as described in Art 32, including a filtering stage, CBA and consultartion, needs to be performed, all aiming at considering only those case where a crystal clear socio-economic benefit is seen and approved by the NRA.

Issue	**Application of the network code to Power Generating Modules that are under construction or not yet connected**
Section	Article 3(4)
Proposal	Comments were raised on the consequences of ongoing tenders and design periods of generators. Also confidentiality of final and binding contracts is indicated as a crucial item in the verification process of Art 3(4).
Evaluation	Partially agree
Justification	A two year period is introduced after the entry into force of the code by which a generator can still be considered an existing user if a final and binding contract is signed within this period. Confirmation needs to be provided within a 30 month period after entry into force (i.e. an additional 6 month period after these two years for the delivery of documents). This two year period gives headroom for national law to adapt to the European Regulation and for national choices of requirements/parameters to be set, e.g. in all references to Art 4(3). The requirement is relaxed as that not all final and binding contracts are needed, but a substantial proof needs to be available. Also no reference is made to the terms under which a contract can be terminated, as this is in some cases covered by national law. It is clarified that the NRA will be the auditor in this case. Confidentiality issues are covered by Art 5.

Issue	**Categorization of Significant Generating Units**
Section	Article 3(6)
Proposal	Generating Unit should be changed to Power Generating Facility.
Evaluation	Disagree
Justification	The definitions of Generating Unit (now Power Generating Module), as well as that of Synchronous Power Generating Module and Power Park Module have been revised to give more clarification. Whereas some present national grid codes prescribe requirements at the facility level, this grid connection network code clearly focuses on the module as the core element for which compliance at the connection point has to be demonstrated, in order to assure that basic capabilities are available in operational conditions and market procurement. In

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	this respect see also the published paper entitled “NC RfG in view of the future European electricity system and the Third Package network codes”

Issue	**Disclaimer on the dependency of power plants operation on several factors**
Section	Article 3.6 – Scope. Power Generating Modules categorization
Proposal	Add new paragraph: h): The Relevant Network Operator and the Power Generating Facility Owner shall specify in the Connection Agreement (or alternatively in the Final Operational Notification) specific conditions and particular operating modes, when the Generating Unit has a right not to fulfil the requirements of the Network Code.
Evaluation	Partially agree
Justification	It is accepted that various, possibly technology-specific, circumstances may limit the delivery of services enabled by the requirements of this Network Code. However, these circumstances shall not result in general limitations, but often need to be assessed on a case-by-case basis. In the revision of the draft code the following points are noted: • The option of derogations is implemented in this Network Code to deal with case-specific issues when proper justification can be provided, as well as for classes of units (e.g. a specific technology). • Operational constraints of CHP units with Active Power output rigidly coupled with steam production are taken into account in the exemption of Art 3(6)g for requirements related to continuous controllability of output. • Operational constraints for industrial loads with sensitive production processes are taken into account in the right on islanding prescribed in Art 3(6)h in agreement with the Relevant Network Operator and the Relevant TSO. • Some connection requirements clearly refer to ambient/operational conditions for the avoidance of doubt, e.g. in LFSM, maximum active power output reduction at underfrequency, or the delivery of reactive power in case of maintenance/failure.

Issue	**Change of the Table 1 Maximum Active Power and Voltage thresholds**
Section	Article 3(6)
Proposal	From the perspective of manufacturers, the classification should be undertaken with no allocation to voltage levels. Besides, it is proposed to specify the range of each type giving no flexibility to the Member States for decision. E.g.: Type A: 3.68 kW – 1 MW; Type B: 1 MW – 50 MW; Type C: 50 – 75 MW; Type D: > 75 MW ; Other proposals included raising the voltage threshold of 110kV for type D to 170 kV. Some proposed to include a voltage threshold for type C requirements as well at 45kV. Some proposed to raise the Type D threshold to 250MW
Evaluation	Disagree
Justification	The significance test of users has to include voltage as prescribed by the FWGL. In addition a final decision on significance is to be taken at national level. The categorisation of Generating Units is based on assumptions of the future developments of the generation portfolio and the needs for secure system operation. A graded approach on significance by introducing different categories reflects the different levels of impact of generation units on cross-border network issues and shall be considered as significance criteria. It is accepted that various, possibly technology-specific, circumstances may limit the

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	applicability of requirements of this Network Code. However these circumstances shall not result in general limitations, but often need to be assessed on a case-by-case basis. The option of derogations is implemented in this Network Code to deal with these issues. Derogations can be applied for by Power Generating Facility Owners for individual units, as well as by Network Operators for classes of units. Current low market penetration of new technologies cannot be accepted as a reason for exemption from the provisions of the Network Code. It has recently been demonstrated that political decisions and market incentives may result in rapid increases of certain generation technologies. Hence, it is of importance, that relevant requirements are met already at an early stage. Maximum Capacity is acknowledged as the main driver to determine significance of the user with regard to cross-border impact. As such a threshold at 45kV in order to exempt units connected at a lower voltage from certain basis requirements is not accepted. Type D requirements do focus on capabilities (e.g. PSS to damp power oscillations) relevant for the EHV network. The threshold of 110kV is seen as the European average threshold for the "cross-border network". A threshold of 250MW is considered too high in the context of the changing generation portfolio to more dispersed generation. Also it has to be stressed that the classification is done at the Module level, not the Facility level which is common in some present grid codes. Further info on the need for requirements at low Maximum Active Power levels is provided in FAQ 7.

Issue	**Lack of harmonization in requirements**
Section	Article 3(6)
Proposal	A revised process for categorization of users is proposed: The opening of the network code formulated in the present draft - e.g. article 3 (6b, 6c) - into an option for system operators, which results in individual regulations on the level of specific systems operators and relevant operators of generating plants, is contrary to the mission to find a solution for cross-border network issues, which fundamentally call for a broader context. This regulation principle in the network code does not result as such in harmonisation of the requirements at European level, which is necessary for supply security from the perspective of the manufacturer.
Evaluation	Disagree
Justification	Please check FAQ 1: harmonization of connection requirement is not an objective of this NC in itself. Within the same synchronous area, there are very different systems (in terms of network, generation portfolio, load characteristics) which may require different thresholds.

Issue	**Pump-storage Power Generating Modules**
Section	Article 3(6)f
Proposal	Pump-storage variable speed Generating Units shall fulfil requirements applicable to Synchronous Generating Units taking into consideration the specific technology used. Proposals and questions were raised whether storage should be covered by the Demand Connection Code as well.
Evaluation	Agree
Justification	It is clarified that synchronous compensation operation shall not be limited in time by technical

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	design of the Power Generating Modules. It is not agreed that synchronous compensation capabilities should be market based. Like all other capabilities for reactive power provision in this network code, it is a mandatory technical feature, without prejudice over the manner in which the delivery of the service is to be procured. The definition of Synchronous Power Generating Module clarifies that synchronously coupled storage in generation mode is covered by this Network Code. Art 3(6)f states in addition that pump-storage has to fullfil the requirements of this code in both generating and pumping mode. It is noted again that this relates to whether a module can operate in both modes. If a seperate pumping module exists in the facility, this has to comply with the Demand Connection Code.

Art.	***Comment***	***Assessment***	***Response***
3.3	Existing Generating Units not covered by the NC	agree	Art 3.3 is to refer to Existing Generating Modules instead of Existing Generating Facilities
3.3	Existing Generating Units not covered by the NC, shall be bound by national law even if this is repealed. This creates a legal risk.	disagree	The code intends that in case national law is repealed, it takes existing units, not covered by the NC into account still. As European Regulation supersedes national law, there is no gap; it is however expected that amendments in national law still take this provision into account.
3.5	Classification based on voltage and MW capacity	agree	Accepted to reword MW Capacity as Maximum Capacity.
3.6	Missing significance test to decide the cross-border impact of the unit	disagree	A definition of "Significant Power Generating Module" is given in the glossary. A description of functionalities is given in Art 3(6). The comment does not provide a more detailed proposal.
3.6	A security criteria hierarchy is needed in a new article 3(7)	disagree	Security criteria cannot be ranked as proposed. For example, network security may affect other security criteria mentioned in the proposal and cannot be considered independently and with a lower priority. Considerations of electrical protection due to internal faults and the relation with the network code provisions are given for type B modules in Art 9(5)b.
3.6	Connection point. Different PPM owners connected to same LV side of the transformer	disagree	The Connection point is determined by the interface of a Generating Unit and a transmission, distribution and closed-distribution network. It is out of the scope of this Network Code to determine, whether this interface is on the HV or LV side of a transformer. Clarification on the definition of PGM/PPM with an example of different PPMs at residential level is provided in the FAQ document
3.6	Significant units	disagree	Article 3(6)a-d already describes well the significance and provides corresponding criteria. Wording is considered appropriate.

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3.6	Thresholds regular re-assessment period	disagree	Within the same synchronous area, there are power systems operated by different TSOs with different characteristics e.g. in network and portfolio. Therefore, different thresholds for different countries should not be prevented. Thresholds will be defined by each relevant TSO pursuant to Article 4(3), hence a fully transparent process will apply. A minimum time frame of re-assessment of three years is chosen in line with transition period of the code itself.
3.6	Justification missing on voltage threshold (110 kV)	disagree	Voltage, as one of the parameters for classification of units (as prescribed by the FWGL), is adequate since generation units connected above 110 kV level have a larger impact on the cross border system security. The specific level of 110kV is taken as an average European level starting as of which Type D requirements, such as PSS, have a clear relevance and cross-border impact.
3.6.a	NC-RfG should only regulate facilities that have a direct impact on cross-border system performance. Removal of type A	disagree	Please check FAQ 7 for further clarification on this topic
3.6.a	type A: 460 W (230 V* 2A) or more per phase or 1380 W as results in three phase systems	disagree	Type A level has been lifted to 0.8 kW in order to still include 1-kW-units (units on which reasonable market prospects aspect by political choices) with a sufficient margin.
3.6.a	A Synchronous Generating Unit or Power Park Module is of Type A if its Maximum Capacity is 400 W or more. Modification is needed to have an identical approach for a generating unit at an industrial site and a unit directly connected to the grid	partially agree	Industrial networks topic have specific considerations as prescribed in Art 3(6)h
3.6.a	Editorial comment: change order of paragraphs	agree	Accepted
3.6.b	Request that only offline parameter settings may be done by the Relevant Network Operator	partially agree	Not prescribed by the requirements itself. Details for offline/online change are to be dealt with at national level.
3.6.b	Power Generating Facility Owners shall be involved in the process of determination of the categorization (threshold and the voltage levels).	partially agree	The proposal is made by the TSO from the perspective of system security. Involvement of the PGF owner is formalized by the national framework as referred to in Art 4(3), including an involvement of the NRA.
3.6.b	Re-assesment period to be changed from 3 to 5 years	disagree	The power system conditions and its generation/load portfolio may change rapidly, a.o. due to political decision and incentivation. Three years is considered an appropriate re-assessment time period, in line with the transition period of the initial network code itself. In case of re-assessment of a threshold, the code clarifies that units that are new compared to the initial code, but existing compared to the amendment, do not automatically have to comply with requirements of a higher category; the same process for retro-active application

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			applies here.
3.6.b	Editorial comment: change order of paragraphs	agree	accepted
3.6.b	Request from some DSOs for defining all settings for type B requirements by DSO and the possibility to set additional requirements.	partially agree	The network code makes a deliberate choice in each requirement whether the specification is set by a) the Relevant Network Operator, b) The RNO in coordination with the Relevant TSO, or c) the Relevant TSO, taking into account impact on protection schemes and settings of the distribution network.
3.6.b	Proposal of Maximum capacity threshold (for the Baltics)	partially agree	Thresholds of type B and C have been increased for the Baltics to have a more coherent approach with other synchronous areas, taking into account specific system conditions.
3.6.b	justification of type B thresholds	disagree	Arguments are given against the type B thresholds, based on present generation portfolios. Mentioned costs have no clear reference.
3.6.c	Balancing services definition missing		This term has been replaced by "ancillary services" which is more general. The term is not defined, as it has no specific requirement related to it, but is used in the context of enabling stable system operation ("ensure stable operation of the interconnected Network, allowing the use of ancillary services from generation Europe wide")
3.6.c	Editorial comment: change order of paragraphs		Accepted
3.6.d	Editorial comment: change order of paragraphs		Accepted
3.6.d	FRT requirements for PPMs are too strong		The FRT requirement applies at the grid connection point of a PPM, not at the connection point of a wind turbine inside a PPM.
3.6.d	Clarifications on the interpretation of Table 1	agree	Art 3(6)a-d have been reformulated to avoid confusion.
3.6.d	There should be an obligation on the part of the Relevant Network Operator to formally notify all users (within three years of the Network Code coming into effect) what, in the reasonable opinion of the Relevant Network Operator, there type rating is	disagree	The code does not apply to existing users, unless a the whole procedure for retro-active application has been gone through. For new users, the owner is expected to know the applicable law and codes, as in all cases.

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3.6.e	Remove "unless modified by a decision of the Relevant Network Operator pursuant to Article 4(3)" in Art 3(6)e to avoid discrimination	agree	Non-discrimination is ensured by following procedures according to article 4(3).
3.6.e	The following text should be included as a new paragraph in Article 3(6)(E): "For nuclear power plants, nuclear safety considerations shall always override this Network Code in case of conflict between nuclear safety considerations and this Network Code."	disagree	The NC applies to new power plants. The link between nuclear safety and the requirements of this connection code are explained in more detail in FAQ
3.6.f	equal treatment of pump and turbine mode is not possible.	disagree	The requirement refers to Modules that are able to operate in both modes, not if pumping and generation is done with separate Modules.
3.6.f	The cross reference to Article 15(2) (Voltage stability of Type B Power Park Module) does not make any sense	disagree	Doubly fed pump-storage units must provide fast acting reactive current injection as specified in 15(2)(a). Due to their nature they cannot achieve the reactive current injection of a synchronous unit
3.6.f	National laws for protecting the environment and technical issues lead towards limited possibilities of managing the water reservoir. Synchronous compensation operation for unlimited time can only be granted if a (de-)coupling device is installed between generator and turbine. This only makes sense in case of agreed ancillary services.	agree	Clarified that the technical design shall not limit unlimited time operation.
3.6.f	Definition of Synchronous Compensation Operation is missing The cross reference to Article 15(2) (Voltage stability of Type B Power Park Module) does not make any sense	agree	Definition of "Synchronous Compensation Operation" introduced.
3.6.f	Request adding this at the end of the paragraph: " feeding the required reactive current no later than 60 milliseconds after the fault inception into the network (control response time). "	disagree	Prescriptions of fast reactive current injection are considered clear.
3.6.g	Request to say this "For avoidance of doubt Pmax definition applies" instead of "active power output"	agree	Accepted
3.6.g	Delete subparagraph g) because it should be in the definitions (article 2)	agree	It has been replaced the term "active power output" in case this is the problem with this subparagraph.
3.6.g	In general there are other obligations that need to be fulfilled so as heat. But generating facilities also have to stay within the limits described in their environmental permits. Are these permits leading or is the code leading? Producers do not want to violate their permits because they can be penalized.	partially agree	A specific consideration for CHPs in which steam production is rigidly coupled with power output, is introduced. The design of the new power plants must be done to fulfil the environmental requirements and this code at the same time, this does specify conditions for operation. If environmental constraints are considered to restrict the design as well,

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			argumentation has to be analysed in the derogation procedure.
3.6.g	Does this refer to sent out electricity (into the transmission / distribution network) or cc the power generator at the terminals? There are CHP plants located within private networks and only export a small amount of active power into the TSO/DSO owned system.	disagree	Requirements are to be complied with at the connection point, regardless of the power delivered into the TSO/DSO grid

ARTICLE 4 – REGULATORY ASPECTS

Note: Article 4(4) of the draft code published on 24 Jan. 2011 is now replaced by a new Article 5 in the final Network Code.

Issue	**Impact assessment is missing**
Section	Art. 4(1)
Proposal	Add the requirement of an impact assessment
Evaluation	Disagree
Justification	The Initial Impact Assessment is performed by ACER, whereas ENTSO-E provides a series of supporting documents which contain a justification of various requirements included in this Network Code where appropriate.

Issue	**In the balance between non-discrimination, transparency and the other objectives, it is unclear how the requirements are balanced against one another**
Section	Art. 4(2)
Proposal	None
Evaluation	Disagree
Justification	Many of the requirements have been common practise for decades. They shall contribute to ensure system security from a system engineering approach, taking into consideration both the network and the generators. Technical specifics of interface technologies are taken into account where reasonable. Finding a correct balance implies for example that some requirements are exhaustively defined for all regions (frequency ranges), while some are non-exhaustive so that local conditions can be taken into consideration (FRT). In the latter case, transparency, non-discrimination and other (local) objectives are still endured in the provisions of Art 4(3).

Issue	**Market based instruments should be preferred over grid connection requirements (to ensure economic efficiency)**
Section	Art. 4(1)
Proposal	Addition that market based systems should be used in most cases instead of grid requirements
Evaluation	Disagree
Justification	For justification on this topic, see the ENTSO-E paper entitled “NC RfG in view of the future European electricity system and the Third Package network codes”

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Issue	**DSO's shall have the same right as TSO's to take into account regional differences**
Section	Art. 4(2)
Proposal	Add DSO at the end to ensure, that also DSO can take into account regional differences.
Evaluation	Agree
Justification	TSOs, DSOs and CDSOs shall have the right to take into account these differences when defining requirements, in compliance with the provisions of this Network Code and their national law.

Issue	**The TSO's should not be limited to take into account only "marginal" differences**
Section	Art. 4(2)
Proposal	Deleting the word "marginal"
Evaluation	Agree
Justification	All differences should be taken into account, without prejudice on their extent.

Issue	**Public consultation in case of unilateral decision by a system operator (transparency and stakeholder involvement)**
Section	Art. 4(3)
Proposal	Addition in the sense, that any unilateral decision of a relevant system operator should be followed by a public consultation
Evaluation	Disagree
Justification	The national legal framework will establish the detailed procedures while respecting the implementation of Art 37(6)(a) and (7) and (10) of Directive 72/2009, referring to the involvement of NRAs. This procedure may consist of a public consultation.

Issue	**Standardisation throughout Europe preferred, based on a concern of too many individual requirements**
Section	Art. 4(3)
Proposal	Addition, that any decision and or agreement with reference to this article should also be performed respecting national, European and international technical standards.
Evaluation	Disagree
Justification	The requirements will be decided at the national level but (1) within the range provided in the NC and (2) following the procedure established in Art. 4 (3). This considerably decreases the level of legal uncertainty for generators and manufacturers. It is up to the national level to decide on alignment with voluntary international standards where deemed appropriate.

Issue	**Cost allocation**
Section	Art. 4(4)
Proposal	Addition that the costs which have to be borne by other parties shall, in compliance with Article 4 (2) be borne by the real originator of the costs and that in the cost-benefit analysis, the costs and benefits will be compared for each party.
Evaluation	Disagree
Justification	This paragraph only provides a basis for tariff calculation of a regulated Network operator. Cost Benefit Analyses in the retro-active application and derogation procedure analyse the socio-economic net benefit. The eventual allocation for non-regulated parties is out of the scope of

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	this Network Code.

Issue	**Cost recovery clause**
Section	Art. 4(4)
Proposal	Deletion of this clause as it may not be ENTSO-E's task to decide who bears the costs related to the obligations imposed by this NC RfG. Such a regulation should be handled by the Regulatory authorities.
Evaluation	Disagree
Justification	This paragraph does not stipulate that all costs related to the obligations referred to in this Network Code are borne by the network operators. This paragraph only stipulates, that the costs that are borne by the Network operator and are assessed reasonable and proportionate when implementing the network code, shall be taken in account for tariff calculation and shall be approved by the NRA. To guarantee transparency, the Network Operator shall do best endeavours to provide relevant information when requested by the NRA.

Issue	**Investments of generators to meet system requirements set by TSO**
Section	Art. 4(4)
Proposal	Addition that the costs arising from changes to generators, required by TSO should also be taken into account in the calculation of tariffs and be borne by the regulated network operator.
Evaluation	Disagree
Justification	A distinction is made between regulated and non-regulated market actors. The clause on recovery of costs applies to regulated Network Operators in line with the relevant regulatory mechanism. The code does not prevent decisions to be taken at national level for cost recovery of non-regulated actors.

4.1	The requirements are too high (and thus too expensive). Costs should be reduced by accepting more locally set requirements	disagree	Most of the requirements are not exhaustively prescribed by this Network Code but call for further specifications and details to be defined at National level. This approach allows for taking into consideration regional characteristics and prevents from specifying too stringent requirements, which would cover worst-case situations all over Europe.
4.1	"overall efficiency" is not explained or justified by a CBA and is not transparent/needs ACER validation	disagree	Principle of optimisation between highest overall efficiency and lowest total cost for all involved parties is a basis for the requirements. The optimum can be considered as not to be the highest overall efficiency nor the lowest total cost for itself but overall the optimum for the involved parties.
4.1	The total costs (both to system and generators) should be taken into account, and should be dealt with in greater detail	agree	Relevant principle in the context of Cost Benefit Analyses to be performed for retro-active application and derogation procedures.

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4.1	The principles of non-discrimination etc stated in art. 4.1 should also apply for decisions to be made at national and/or TSO level	partially agree	Directive 2009/72/EC already stipulates the principle of non-discriminatory, transparency etc. These principles shall be established by national legislation and must be respected in any cases, also if it is not explicitly mentioned in this NC.
4.2	The NC lacks a process to identify and define the “real originator of the costs” (incl ACER role).	disagree	The real originator is understood to be entity where the costs occur. Any other interpretation will cause confusion and will not come to a clear result, because of the interdependencies between performance of the network and the generating units.
4.2	Existing generators should either be compensated (by the beneficiaries/TSOs) for retrofitting costs or given exemptions if retrofitting is not justified by CBA	disagree	Cost and benefits shall be determined on a socio-economic level according to ACER's FWGL. This requires no analysis of a shift of costs between a Power Generating Facility Owner and a Network Operator. This will be paid by society in any case, either by energy price or by system usage tariffs. Please refer also to FAQ 12.
4.2	Objective differences between technologies should be handled by NRA after public consultation (outside scope of NC)	disagree	At the end of Art. 4 (2) it is mentioned, that TSO and DSO have the right to take into account the differences also in compliance with the national law. This means, that the national law says if the NRA shall be involved or not. Normally there should be a regulation, that a decision of TSO or DSO can be appealed to the NRA or another court.
4.2	TSOs and DSOs shall process connection applications irrespective of location/region	partially agree	Principle is acknowledged, but is out of scope of this network code. The application process may be covered in greater detail in a future network code on connection procedures.
4.2	The TSOs and DSOs shall not include more onerous requirements (note that is based on an earlier version of the draft code)	disagree	Such a clause would be in contradiction with Article 6, which allows for more stringent requirements on national level. Article 6 is explicitly requested by ACER's FWGL.
4.2	The criteria relating to the "real originator of the costs" is misleading because in effect it creates exceptions to the principles of efficiency, transparency and non-discrimination	disagree	A balancing between the principles has to be made, not in every case each principle can be taken into account in the same way.
4.3	The article is unclear and needs to be reformulated	disagree	This paragraph gives guidance which framework has to be respected for agreements between Network operators and power generating facilities. Note that the Article has been revised to bring alignment with the implementation of Art 37 of Directive 2009/72/EC
4.3	The inclusion of the principle of proportionality will lead to too many discussions	disagree	Principle of proportionality is a basic principle of EU legislation and its application is required by Directive 72/2009, Regulation 714/2009 and ACER's FWGL

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4.3	The NRA shall test if the decisions made by TSOs are in fact relating to cross border issues	disagree	As the secure operation of the national grid is a condition for secure operation within a synchronous area, decisions made according to Art. 4 (3) are in a wider sense always cross-border issues.
4.3	Could lead to competition distortion	disagree	Even if TSOs continue to follow guidelines per synchronous area, the final approval by a NRA is per definition at the national level without a requirement on a common decision across Member States.
4.3	Art. 4.3 should apply to the whole NC	disagree	This Article applies only to requirements for which additional choices (within the range provided in the NC and following a described procedure) must be made at the national level.

ARTICLE 5 – CONFIDENTIALITY OBLIGATIONS

Note: Article 6 in the final Network Code due to insertion of a seperate Article 5 on ‚Recovery of Costs'.

Issue	**Clarification on definitions of safety and security data**
Section	Article 5
Proposal received	Data safety and security rules should be further specified. Add a sentence with reference to a standard for data safety
Evaluation	Disagree
Justification	Article 5 (Confidentiality Obligations) is a general commitment by receivers of all types of information to preserve its confidentiality and to use it only for the purpose it has been provided for. Therefore, there is no need to specify the precise means to safeguard this.

Issue	**Precision regarding disclosure of inforrmation required by law**
Section	Article 5
Proposal received	The generator has the right to know what data is to be disclosed, when and to whom. Add: Prior to disclosure, the TSO will justify the disclosure and will inform the owner of the data.
Evaluation	Agree
Justification	It is only fair that the owner of information that is disclosed in accordance with legal requirements must be informed of the said disclosure. It is also fair to admit that Relevant Network Operator, Relevant TSO, Relevant DSO or Relevant CDSO may not be in the position to inform the owner oft he information prior to diclosure. Therefore, article 5.2 has been amended by: „Such disclosure shall be reported to the owner of such information and data." Also a new clause has been added stating „In case of disclosure for other purposes than those described in Article 6(1) and/or (2), a Relevant Network Operator, a Relevant TSO, Relevant DSO or a Relevant CDSO shall seek the consent of the owner of such information and data. This consent cannot be unreasonably withheld."

Issue	**Insertion of certification bodies as recipients of confidential information**

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Section	Article 5
Proposal received	Include Certification Bodies in the obligations of confidentiality when Power Generating Facility Owners or Relevant Network Operators use Certification Bodies to show the compliance with the requirements of the Network Code
Evaluation	Disagree
Justification	The relationships between certifications bodies on the one hand and Generating Facility Owners or Relevant Network Operators on the other hand is not adressed in this code. Needless to say that when Facility Owners and Relevant Network Operators need to disclose confidential information to third parties, they will have to do it in accordance with article 5 and sign a proper confidentiality agreement when needed.

ARTICLE 6 – RELATIONSHIP WITH NATIONAL LAW PROVISIONS

Note: Article 7 in the final Network Code

Issue	**More stringent requirements is only allowed under certain conditions or in certain situations, see proposals**
Section	Art. 6
Proposal	Various proposals on adding conditions to Art 6: • More stringent requirements but only when justified by a full Cost Benefit Analysis and taking into account environmental issues; • More stringent requirements- MS should not be in the position to impose further requirements if they are not related to cross-border issues; • More stringent requirements- each more stringent requirement to be decided at the level of MS should be reviewed by ENTSO-E and ACER; • More stringent requirements- regions with the same grid needs should ask for the same extra requirements; • More stringent requirements- risk of additional costs related to the need to comply with more stringent requirements; • More stringent requirements rules should not apply to Type A; • Ambiguity around expression "compatibility with the principles set forth in this Network Code" = to be replaced by "within the operating limits than those set out herein"
Evaluation	Disagree
Justification	No additional conditions are added. Article 6 of NC RfG refers to a general principle of EU law : the NC will be EU legislation prevailing over national legislation and does not prevent the adoption of more stringent requirements at the national level. Therefore one can argue that it is common practice, allowed under general principles of EU law, that Member States shall have the right to maintain or introduce more detailed or more stringent measures. Besides that, for all measures that do not affect cross-border trade, Article 8 § 7 of Regulation (EC) 714/2009 gives the Member States the explicit right to establish national network codes. The Framework Guidelines for this Network Code specify that this Network Code shall define appropriate minimum standards and requirements applicable to all significant grid users (paragraph 2.1). Paragraph 1.2 of the Framework Guideline also states that "Where there are benefits, and if compatible with the provisions in the European network code(s), national codes, standards and regulations which are more detailed or more stringent than the respective European network

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	code(s) should retain their applicability." This gives the Member States the possibility to establish more detailed and more stringent measures. Besides that there are sufficient checks and balances added to article 6. The measures must be compatible with the principles set forth in the Network Code. Therefore, for example the principle of non-discrimination and transparency to which Article 4 refers to have to be taken into account.

Issue	**Relationship between Article 6 and Article 4**
Section	Art. 6
Proposal	Reference on the principles in article 4 is needed for alignment between states and TSO's. With reference to the comments for article 4; if not generally adopted throughout in the code the principles of article 4 shall apply.
Evaluation	Disagree
Justification	In paragraph 1.2 of the Framework Guideline there is clearly stated that under certain conditions the measures can be more detailed or more stringent. A reference between article 6 and article 4 is not needed for alignment between states and TSOs. As set forth in article 6, a Member State can only maintain or introduce measures that contain more detailed or more stringent provision than set forth in the Network Code, if the measures are compatible with the principles set forth in the Network Code. Therefore the principles of non-discrimination to which Article 4 refers to have been taken into account.

ARTICLE 7 – GENERAL REQUIREMENTS FOR TYPE A POWER GENERATING UNITS

Note: Article 8 in the final Network Code

Issue	**Some technologies (e.g. linear stirling engines) will not be compliant.**
Section	Art. 7
Proposal	Small units (e.g. stirling engines) will not be able to comply with type A requirements. Exempt this technology from these requirements.
Evaluation	Disagree
Justification	It is acknowledged that various, possibly technology-specific, circumstances may limit a reasonable applicability of requirements of this Network Code. However these circumstances shall not result in general limitations, but often need to be assessed on a case-by-case basis. The option of derogations is implemented in this Network Code to deal with these issues. Derogations can be applied for by Power Generating Facility Owners for individual units, as well as by Network Operators (e.g. triggered by manufacturers) for classes of units. Specific temporary derogations may be considered. Current low market penetration of new technologies cannot be accepted as a reason for

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	exemption from the provisions of the Network Code ex ante. It has recently been demonstrated that political decisions and market incentives may result in rapid increases of certain generation technologies. Hence, it is of high importance, that relevant requirements are met already at an early stage.

Issue	**Frequency range**
Section	Art 7
Proposal	Please reduce or justify the frequency range values and time periods
Evaluation	Disagree
Justification	Frequency range requirements defined in the Network Code are in line with the existing standard IEC 60034 on rotating electrical machines, which prescribes an unlimited time period of operation in the range of 49-51 Hz and limited operation in case of wider ranges within 47.5-51.5 Hz. An exception is GB (with even wider ranges) which has completed a national process including all stakeholders and the conclusion, which was a reduced requirement, has recently been approved by the National Regulator. Details are accessible at http://www.nationalgrid.com/uk/Electricity/Codes/gridcode/consultationpapers/2010/ (section D/10). Moreover the frequency range and time of operation are already implemented in some countries and result in minor change in many others. The time for operation at low and high frequency is in some case longer than what is currently done, but this is justified by the need to cope with an increasing share of distributed generation in case of severe system events. The focus for wide ranges and its related time periods is not for normal operation. The system restoration in case of a big event (system split...), will take a longer time due to the huge amount of (smaller) power generating modules that will be involved in such a process and in which case a second black-out should be avoided. More information on the link with IEC 60034 can be accessed in FAQ … Further details on the relation with present grid codes can be accessed in … For more discussion with stakeholders on the topic, please refer to minutes of meetings with Eurelectric WG Thermal / VGB / EUTurbines on 21 December 2011, and both RfG User Group meetings, where compliance with IEC 60034 was acknowledged and confirmed feasible by manufacturers. https://www.entsoe.eu/resources/network-codes/requirements-for-generators/

Issue	**Combined requirement for voltage and frequency ranges**
Section	Art. 7
Proposal	Add a table for combined requirements for voltage and frequency ranges in one diagram.
Evaluation	Partially agree
Justification	Combined interpretation of frequency and voltage ranges is elaborated in FAQ 20. As soon as one value of either voltage or frequency exceeds one of the criteria defined in this code (in magnitude of deviation and time period), units are not required to be capable to remain connected.

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Issue	**Limited Frequency Sensitive Mode**
Section	Art. 7
Proposal	Various proposals are received : 1) Please justify this requirement; 2) LFSM-O Active Power Frequency response should be limited to take into account minimum power generating level; 3) Allow specific Frequency ranges and LFSM parameters for generating units connected to DSO's network; 4) Wider Frequency ranges and/or LFSM should be offered in ancillary services, not required by TSO; 5) LFSM-O Active Power Frequency response should have a coordinated droop among TSOs of a same synchronous area. The initial delay shall be technology dependent.
Evaluation	Partially Agree
Justification	In addition to this justification another one will be provided by the Ad-hoc team. 1) LFSM-O is a requirement relevant for system security to cope with severe system events. The FSM mode aims at continuously maintaining the frequency at its nominal value of 50Hz when the system is operating in normal condition. But when a large event occurs on the system, the FSM may not be enough to maintain the frequency close to 50Hz, in this case all unit shall participate to frequency reduction to mitigate further frequency excursions. If it is not stopped, the increasing frequency would eventually lead to a complete generation disconnection with possible further adverse system impact. Moreover, this requirement has a relatively low cost for systems as it does not require any energy reserve (compared to some implementations of FSM) 2) The code has been improved to take into account the minimum generating power level. The following sentence has been added: “The Power Generating Module shall be capable of either continuing operation at Minimum Regulating Level when reaching it or further decreasing Active Power output in this case, as defined by the Relevant TSO while respecting the provisions of Article 4(3).” With Minimum Regulating Levell being “minimum Active Power as defined in the Connection Agreement or as agreed between the Relevant Network Operator and the Power Generating Facility Owner, that the Power Generating Module can regulate down to and can provide Active Power control.” 3) Narrow frequency range for DSO connected units would create a risk of the "50.2Hz photovoltaic issue" in Germany. More sophisticated loss of mains protection schemes based on state of the art technologies are required instead. LFSM-O needs to be specified by the TSO to avoid risks of mass disconnection. Note, in other requirements where decisions on protection settings are attributed to the RNO, Art 4(4) still applies “Any decision by a Network Operator other than the Relevant TSO and any agreement between a Network Operator other than the Relevant TSO and a Power Generating Facility Owner shall be exercised in compliance with and respecting the Relevant TSO’s responsibility to ensure system security according to national legislation. Further details to ensure this principle may be specified either by national legislation or by agreements between the Relevant TSO and the Network Operators in its Control Area, as the case may be.” 4) This code specifies withstand capabilities and technical requirements. The procurement of ancillary services, e.g. market based, contractually agreed, in operation/access codes, … is out of the scope of this code. Further justification on the link between mandatory capabilities and procurement of services is provided in the ENTSO-E paper entitled “NC RfG in view of the future European electricity system and the Third Package network codes” 5) The actual setting of the parameters shall be coordinated on a synchronous area level, taking into account local specificities. However, this aspect it out of the scope of the code. The technical capability covers the range of the Droop a PGM needs to be

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	able to provide, the actual setting will be made by the Relevant TSO. Technology dependent initial delay of frequency response is already covered by the term "... as fast as technically feasible ...". Concerning settings of LFSM parameters, this document only describes requirement for connection, in actual operation of a network, the need is the global response.

Issue	**Remote switching off of type A unit**
Section	Art. 7
Proposal	Remove I/O-Port for switching off Type A units. This shall not be triggered by the RNO because it can have adverse impact on the owner's business model.
Evaluation	Disagree
Justification	This requirement can be implemented at relatively low cost on type A and B modules (it is not required for type C and D). Note, that this requirement covers only the capability of the PGM, no prescriptions or constraints are set on the communication path between PGM and Network Operator ("The Relevant Network Operator shall have the right to define while respecting the provisions of Article 4(3) the requirements for further equipment to make this facility operable remotely."). The capability will provide substantial benefit to managing dispersed generation during and associated network constraints with cross-border impact or severse system events in case of high aggregated Active Power output of dispersed units. Moreover some flexibility is given to this requirement by requiring the TSO to take a decision pursuant to art 4(3), this would allow to take into account national or technology based specificity, and/or to use relevant standards. The conditions for the precise use of this capability are out of the scope of this code. The only functional capability prescribed is that Active Power Output needs to be reduced within less than 5 seconds following an Instruction by the RNO. Disconnection from the network can be necessary in case of disturbed system situations. The problem mentioned, (market issues or technical problem for specific technologies) can be dealt with in contracts with customers or by class derogation.

Issue	**Power infeed in case of frequency deviation**
Section	Art. 7
Proposal	Clarification is requested on the power infeed in case frequency deviation
Evaluation	Agree
Justification	A subparagraph (d) has been added stating "The Power Generating Module shall be capable of maintaining constant output at its target Active Power value regardless of changes in Frequency, unless output shall follow the defined changes in output in the context of Article 8(1) (c), (e) or Article 10(2) (b), and Article 10(2) (c) where applicable."

7.1	Please provide voltage ranges also for A and B Types	disagree	This requirement is not deemed relevant for type A and B in the context of this network code. It is considered a local problem for small units, not a cross-border issue.

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7.1	Add details about quality of measurement of frequency (time filtering)	partially agree	A wide variety of means exists to measure frequency. The revised definition of Frequency clarifies that the fundamental component is considered. Further details on measurements/accuracy are to be dealt with in the compliance procedure.
7.1	Typing mistake : replace type A " units " by Type A "Generating Units"	agree	Accepted, but the terminology has been revised too.
7.1	Clarification that requirements shall apply to Generating Units, rather than to Power Generating Facilities	agree	The wording and definitions of the code have been improved to clarify this point.
7.1	Generating Units not generating power being connected to a Network regarding the provision of auxiliary power supply shall fulfil the requirement set out in the NC for demand connection	disagree	It is not feasible to apply different requirements to a Power Generating Facility depending on its status of operation. It is obvious that all installations in a Power Generating Facility have to be designed in way that enables the fulfilment of the requirements of this Network Code.
7.1.a	Tripping due to safety reasons shall be allowed	agree	Current wording prohibits tripping to frequency deviations only. For other loss of mains protections, such ROCOF, the code specifies "This rate-of-change-of-Frequency-type of loss of mains protection will be defined by the Relevant Network Operator in coordination with the Relevant TSO." No prescription is set on protection settings for internal faults in type A PGMs. As of type B a general clause on electrical protection schemes and settings is applicable.
7.1.a	Add "and economically" to the sentence "Wider frequency ranges or longer minimum time could be agreed if technically feasible."	agree	"If wider Frequency ranges or longer minimum times for operation are economically and technically feasible, the consent of the Power Generating Facility Owner shall not be unreasonably withheld".
7.1.a	Frequency ranges for Baltic should be aligned with those of the Nordics.	agree	Ranges are changed accordingly to 30 minutes for the widest ranges. The option of longer time periods while respecting the provisions of Art 4(3) is added.
7.1	Define frequency requirements for existing units	disagree	The code does not apply to Existing Generating Units unless retroactive application has been proposed and justified by the TSO, challenged in a consultation and approved by the NRA. Wide frequency ranges for new units aim at ensuring a stable recovery by as many units as possible in case of a severe system event. See the justification of the frequency range requirement for further details.
7.1.a	Frequency requirements should be different for embedded generation in an industrial facility(the production quality can't be met with this wide requirements for generation)	agree	Art 3(6)h is introduced to allow islanding in industrial facilities with embedded generation in order to preserve sensitive production processes in critical loads.

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7.1.a	Add standards requirement in the terms and settings for automatic disconnection	disagree	If not set by national regulation or defined by the TSO pursuant to Article 4(3), these terms and settings shall be agreed between the PGF owner and the RNO, so this avoids the problem mentioned. There is no need to add standards in this requirement to avoid individual requirements.
7.1.a	Time period for operation in the different frequency range(table2) should be the same within a synchronous area	disagree	Harmonisation is already provided by guaranteed minimum time periods. If a single TSO (or even all TSOs in a synchronous area) requires a longer time period, e.g. due to changing system conditions, the provisions of Art 4(3) will stipulate how this is possible without requiring an amendment of the European code.
7.1.a	Define only one set of frequency ranges and time periods for all synchronous areas as a minimum and wider ranges at regional level	disagree	As specific needs of each synchronous area are already known, it is more transparent to have the different frequency ranges and time periods already set in the European code. Delegating it to national level to set common values at synchronous level would make the procedure more complex and possible less transparent.
7.1.a	Extend the frequency range up to 52.5 Hz in CE for a short period (regarding disturbance of 4th Nov 2006)	disagree	Other solutions to avoid such a disturbance are already in the code: 30 minutes operation between 51 Hz and 51.5 Hz combined with the capability of LFSM-O.
7.1.b	Change the Rate of change of Frequency (ROCOF) requirement on frequency measurement	agree	The ROCOF requirement is reduced to a principle requirement as no single Hz/s or measurement period can be reasonably defined as common values for an entire synchronous area. The specification is delegated to the national level.
7.1.b	Please specify a time period to stay connected for Rate of change of Frequency requirement	disagree	Note that the ROCOF a requirement needs to be seen in combination with the frequency ranges of Table 2 as well. As soon as the frequency is out of the specified frequency/time ranges, the PGM is not required to remain connected anymore.
7.1.b	Clarification of the ROCOF paragraph. Change "loss of mains protection" to "protection agreed with the RNO in coordination with the relevant TSO	partially agree	This rate-of-change-of-Frequency-type of loss of mains protection will be defined by the Relevant Network Operator in coordination with the Relevant TSO.
7.1.c	LFSM-O Active Power Frequency response - delete "stable operation between speed and power control"	agree	Requirement is revised in order to make this applicable to all technologies.

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7.1.c	LFSM-O Figure 1 : Power reference on which the reduction is based: Pmomentary instead of Pmax	partially agree	This has been partially taken into account. For control of synchronous generators a reference to the actual power output is deemed complex. For PPM the Relevant TSO can choose between Pmax or Pmomentary as a reference for power reduction, while respecting the provisions of Art. 4(3). For PPMs some grid codes do indeed refer to Pmomentary. It is acknowledged that from a system perspective a similar aggregated response is reached.
7.1.c	LFSM-O merge the 2 sub paragraph 1 and 2	agree	Wording revised accordingly
7.1.c	LFSM-O reduction of the initial delay to be shortened from 2s to 1s, to avoid hitting the 51.5 Hz limit too fast.	disagree	The need is already taken into account by stating "as fast as technically possible". The focus lies on the need for proper justification if longer than 2s.
7.1.c	LFSM-O : add a definition of Pmax and change "droop" to "speed droop"	partially agree	Improvement of the droop definition in Article 2 and changes of Power reference for LFSM in art. 7.1.c are included.
7.1.c	LFSM-O parameters settings should be proposed by the PGF owner or based on existing standards and agreed by TSO	disagree	This requirement is based on system security needs and is to be defined by the Relevant TSO. To take into account technical or case specificities, conditions at Minimum Regulating Level are set while respecting the provisions of Art 4(3)
7.1.c	LFSM-O : add values on figure 1	disagree	The range of value for droop and threshold are already provided in the above paragraph
7.1.c	LFSM-O is not relevant for type A from the perspective of cross-border impact.	disagree	Based on potential aggregated impact, taking into account future generation portfolios, LFSM-O is considered to be a basic requirement to ensure stable system operation. See also justifications on type classification and frequency ranges.
7.1.c	LFSM-O link between the settings and the operational code	agree	The principle is acknowledged. No specific link can be written in this code, as the operational codes follow at a later stage. The interdependence is also acknowledged in the ENTSO-E paper "NC RfG in view of the future European electricity system and the Third Package network codes"

ARTICLE 8 – GENERAL REQUIREMENTS FOR TYPE B POWER GENERATING UNITS

Note: Article 9 in the final Network Code

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Issue	**Validity of Article 8 – General Requirements for Type B Units**
Section	Art.8
Proposal received	Delete Article 8. ENTSO-E has not shown that the proposed standard is the appropriate minimum standard as referred to in ACER's FWGL, section 2.1.The draft network code deviates significantly from the requirements for such generators in existing codes and ENTSO-E has not provided a cost-benefit analysis for this requirement.
Evaluation	Disagree
Justification	ENTSO-E position is that the code does not deviate significantly from existing standards and requirements. Some of the requirements may not exist in all grid codes with respect to smaller units of type B. Argumentation for this shift to smaller units is provided in the ENTSO-E paper "NC RfG in view of the future European electricity system and the Third Package network codes"

Issue	**Controllability of active power for Type B Units**
Section	Art.8
Proposal received	Comments on the risk due to sudden steps, rights of TSO/DSO to control units, size of the 20% steps (either too large or too small)
Evaluation	Agree
Justification	The requirement is relaxed with a focus on the principle that the Module needs to be remotely controllable to decrease Active Power Output: "In order to be able to control Active Power output, the Power Generating Module shall be equipped with a interface (input port) in order to be able to reduce Active Power output as instructed by the Relevant Network Operator and/or the Relevant TSO"

Issue	**System Restoration Type B Units – Reconnection after an incidental disconnection due to a Network disturbance**
Section	Article 8.3
Proposal received	The requirement should be more generic, including the role of the DSO. Distinction should be made between small- and large-scale incidents.
Evaluation	Agree
Justification	The role of the Relevant Network Operator is acknowledged. Still, from the perspective of system restoration, conditions defined by the Relevant TSO are needed. The Relevant Network Operator is included by the revised phrasing of "automatic reconnection systems shall be subject to prior authorization by the Relevant Network Operator subject to reconnection conditions specified by the Relevant TSO". The aforementioned conditions can give more details on how to distinguish between small and large scale incidents.

8.1	Connection voltage point for Type B and Type C Units should include 110kV	disagree	See justifications regarding comments on Art 3(6)

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8.1	Requirements should apply to Facilities at the connection point not Units.	disagree	See justifications regarding comments on Art 3(6). The rationale for the thresholds is based on Module level. In addition this code covers capabilities, not delivery of services. In case of maintenance, closure of units, etc… the basic capabilities still need to be present.
8.2.a	Cost recovery for equipment of remote control	disagree	Cost recovery for non-Regulated actors is out of scope for this NC. See argumentation on Art 4(4) for more details.
8.2.a	Standardization of remote control equipment	partially agree	This code prescribes the basic functional capabilities for remote control equipment. Further specifications are to be defined by the RNO while respecting the provisions of Art 4(3). This code does not give a restriction to a specific standard, nor does it impede a given standard (existing or to be developed).
8.2.a	Editorial	agree	The term Units are also replaced by Modules.
8.4	General Management and Information exchange requirements for Type B Units. Article 4(3) should be referenced.	agree	Links to Art 4(3) are inserted where appropriate
8.4	Information exchange delays for Type B Units.	agree	Time stamping time stamping "as defined by the Relevant Network Operator and/or the Relevant TSO while respecting the provisions of Article 4(3)" is explicitly mentioned for clarification.
8.4.a	Definition of "Disturbances to the system" is missing	agree	Paragraph is reworded in terms of "relevant for transmission system stability and to enable emergency actions"
8.4.a	To ensure that the NC requirements do not override requirements on safety/protection, requirements on control schemes, protection schemes and settings are also relevant for Type B units. Now these come into play at type C.	agree	Requirement on electrical protection schemes and settings, as well as on priority ranking of protection and control, are shifted from type C to type B requirements.
8.4.a	Definition of Damping is missing	partially agree	The requirement has been revised in a more general term without the use of the term damping.
8.4.a	Control schemes and settings for Type B units are considered the sole responsibility of the RNO by some; others consider it the responsibility of the PGF owner	partially agree	Responsibility is allocated to the RNO. However an amendment is made as to "The protection schemes and settings for internal electrical faults shall be designed not to jeopardize the performance of a Power Generating Module according to this Network Code requirements otherwise."

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8.4.b	More details on Information Data Exchange are requested (the minimum refresh rate, data resolution and the accuracy of the data and the operation scheme in case of loss of communication.)	disagree	A specific list of information to be exchanged is not considered relevant from a cross-border perspective. Details are left to subsidiarity: "The Relevant Network Operator in coordination with the Relevant TSO shall define while respecting the provisions of Article 4(3) the contents of information exchanges and the precise list and time of data to be facilitated."
8.4.b	Standardization of Information Exchange Protocols	partially agree	This code prescribes the basic principles for information exchange. Further specifications are to be defined by the RNO while respecting the provisions of Art 4(3). This code does not give a restriction to a specific standard, nor does it impede a given standard (existing or to be developed). The benefits of standardized communication protocols, or at least compatibility in exchange protocols, for data exchange between PGFs and the Relevant Network Operator are acknowledged, but details of the protocols used is not within the scope of the NC.
8.4.b	PGF Data collection cannot be done according to a standard defined by the RNO	disagree	The code only stipulates the principle of information exchange without prescribing or excluding specific protocols.
8.4.b	PGF metering should be included in the code	disagree	Metering and payment of energy is out of the scope. The Relevant Network Operator will specify the class of metering equipment in line with national practices, but not in the context of this code.
8.4.b	editorial: Power Facility Owner instead of Power Facility	agree	The wording has been changed into Power Facility Owner

ARTICLE 9 – GENERAL REQUIREMENTS FOR TYPE C POWER GENERATING UNITS

Note: Article 10 in the final Network Code

Issue	**Participation of CHP, Hydro Power Plants, HVDC connections and NPP in LFSM-U.**
Section	Article 9.2.c
Proposal received	Due to technical feasibility and physical/safety related reasons the requirements for LFSM-U shall not be applied for NPP and Hydro Power Plants. Plants which are bound by special legislation like nuclear permissions and/ or water management obligations have no license for frequency control and therefore are not or cannot be designed to fulfill that requirement. Nuclear Power Plants shall be excluded on the grounds of safety and technical ability. River hydro power plants shall be excluded on the grounds of economic viability. Altering power output due to frequency changes leads directly to a production loss as water will flow over the

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	weir. How should the Limited Frequency Sensitive Mode - Underfrequency (LFSM-U) work in cogeneration plants at which the power output is defined through the demand of heat and not electrical power? Should they blast the heat (produced for example by natural gas) to the atmosphere? This is not only a waste of prime energy but it will also mean a bigger investment in system engineering because of the necessary emergency cooling system.
Evaluation	Partially agree
Justification	In principle all the PGMs of type C and D have to be capable to participate in LFSM-U, but the technology and operational limitations are more precisely emphasized: "The actual delivery of Active Power Frequency Response in LFSM-U mode depends on the operating and ambient conditions of the Power Generating Module when this response is triggered, in particular limitations on operation near Maximum Capacity at low frequencies according to Article 8(1) (e) and available primary energy sources." Section 9.2.c. has been improved to focus on these limitations. The actual delivery of Active Power Frequency Response in LFSM-U mode can depend on the operating conditions of the Power Generating Module when this response is triggered, in particular limitations on operation near Maximum Capacity at low frequencies and available primary energy sources. Furthermore, the technical restrictions for CHP in industrial site where steam production rigidly coupled to active power output have been taken into account and a general clause for CHP has been added to the NC in Art. 3(6)g. According to the this new clause, CHPs type A,B, C can be excluded from part of the NC requirements, focusing on continuous operation and controllability, if a set predefined conditions will be met. CHPs with direct heat production do not follow this exemption due to the possibility of buffering. In case valid arguments exist for exemption, the derogation process can be followed. All prescriptions related to the delivery of ancillary services are out of scope of this NC.

Issue	**Participation of PPMs (RES) in LFSM-U and FSM, especially in case of underfrequency.**
Section	Article 9.2.c and 9.2.d
Proposal received	It must be said that Power Park Modules which inherently generate at their Maximum Capacity cannot operate in Underfrequency Mode. Non-programmable plants can raise their production in underfrequency regime only if they do not fully exploit their primary source. Since this is a no sense, we wish that this specific requirement is applied only to programmable units. Providing of Active Power Frequency Response will cause enormous costs for PPMs because there are serious technical difficulties to fulfil this, from an economical Point of view this is not possible to fulfil and would lead to an inefficient operation. In context of FSM, this requirement is not applicable for most renewable energies like photovoltaics and wind turbines. It would require storage technology for smoothing and/or short term yield estimation. The power increase during FSM for variable primary energy source generators (e.g. wind and solar) should be based on the available power as proposed (Pav). The amount of possible reduction should only be limited by the minimum operating level. Wind and solar plants are required to only ever start production once their available power exceeds some value between 2 and 10% of installed capacity and they would be required to remain in hot standby (turning rotor) in order to respond to frequency in the required time (30s). This would mean that an non-proportionate amount of wind is wasted, jeopardizing the EU's renewable energy targets. In this context for PPMs all the range of Active Power should be based on available or actual Active Power, not the Maximum Capacity (reference to the P actual/available not Maximum

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	Capacity).
Evaluation	Partially agree
Justification	In principle all the PGMs Type C and D have to be able to participate in LFSM-U, but the technology and operational limitations will be more emphasized, see previous Issue and response. ENTSO-E wants to clarify that the capability requirement of LFSM-U mode that only Generating Units running below Maximum Capacity (from operational point of view below available 'normal' active power) shall provide this active Active Power Frequency Response. It is expected that the only the headroom power (i.e. power between real (scheduled) output power and Maximum Capacity/available active power) can be activated under LFSM-U. This capability will be assessed in compliance testing. Whether this service is procured on a market basis or requested from all units with a need for headroom to provide additional active power output in case of underfrequency depends on national regulations, operational code, market rules, contractual arrangements or other.

Issue	**Participation of Hydro Power Plants (in particular Kaplan) and NPP in FSM.**
Section	Article 9.2.d
Proposal received	Some NPP´s and HPP have no license for frequency control. e.g. Nuclear power and run of river hydro generating units) and therefore are not designed for that forbidden purpose. The operation in FSM (Frequency Sensitive Mode) for PWR is requires continuous Control Rod moving. The Control Rod system is a safety system and cannot be used for this type of purpose. Also in BWR, where active power control is done by regulating the speed of RCP (Reactor Circulating Pumps), the FSM leads to uneconomical use of NPP. NPP do not have to operate in FSM without deadband. Due to hydraulic restrictions operation in Frequency Sensitive Mode is not possible for some Run of River Hydro Power Plants. The operation of double regulated Kaplan machines in FSM increases the number of relevant load cycles with serious fatigue impact on regulation components. Existing facilities are not designed for fast changes in active power.
Evaluation	Disagree
Justification	In principle all the PGU Type C and D have to be able to participate in FSM, but the technology and operational limitations are more clearly emphasized. It is stressed that these requirements focus on new units. Existing units may have been designed under different market/system conditions. Given the power system challenges ahead, this is no argument for exempting new units. If valid arguments exist to exempt a unit, the derogation process can be applied.

Issue	**Combination of choice of parameters for FSM**
Section	Article 9.2.d
Proposal	A general comment for all network code requirements is that single requirements could be fulfilled but the combination of a set of requirements may be difficult or impossible to meet. Comments given cover the following points, with sometimes opposing views: 1. The active power range (10 %) is too wide and should be limited because it is not common existing value. 2. It is important to point out that the extreme value of 10% is completely unnecessary in almost all of Europe, which means that PPM would be overinvesting for nothing. Our

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	proposal of 1.5% should be enough in most of the European regions 3. There is no need to limit the active power range to 10% of the maximum capacity if no locally-derived grid-induced reason exists (It would only limit the supply of FSM and raise the costs). 4. The range of droop 2 - 20% is too wide. It's not a common value. 5. Combinations of ranges within this table are unachievable. For example, 10% active power in 4 seconds, with 0 seconds delay. Such combinations shall be explicitly excluded. 6. Additionally the initial delay of maximum 2 second may be too restrictive for specific PPM configuration. The proposed range of 2-10 seconds allows adapting the necessity of the grid to the PPM specific capacities on a case by case basis. 7. A two second response time is currently state of the art, as no grid code asks for a lower initial delay. Discrimination of technologies without natural inertia applies, as it is not technically known if shorter times are technical possible. 8. Power stations shall be capable of activating 2 to 10 % of their unit capacity within 30s as maximum. We underline that this requirement for steam turbine sets can only be met if performance and efficiency factors are foregone, thus leading to an increase in CO2 emissions.
Evaluation	Partially agree
Justification	Variation of parameters at TSO level is allowed within the ranges. It is acknowledged that not all technologies may be able meet a combination of extreme values then this combination. For this reason the code is amended by "The combination of choice of the parameters according to table 5 shall take into account possible technology dependent limitations." The ranges of parameters for PPMs are wide because this requirement applies for small systems (e.g. Ireland) as well large systems (Continental Europe). The TSO is responsible for system stability Then the parameters for FSM including the Active Power range will be specified by the TSO, taking into account size of the system, the existing portfolio of generation, incl. technology constraints and common rules existing within synchronous zones if applicable. The distinction between technologies with and without inherent inertia is more clearly emphasized. Shorter activation times than 2 seconds for technologies without inherent inertia will be defined while respecting the provisions of Art. 4(3). For other technologies it is clarified in the text that the 2 seconds is a maximum admissible initial delay for technologies with inherent inertia, not the maximum value for a parameter choice by the TSO.

Issue	**Torsional stress requirement**
Section	Article 9.4.b
Proposal	Proposals made cover the following: 1. to delete this requirements because of: - Significantly deviating from present practices and as such not in line with FWGL (CBA needed), or; - safety reason, or; - not in line with existing standards under which shafts are design for a full synchronization fault. 2. To change the requirements: instead of routine part of normal operation, 50% steps should be consider as "exceptional cases"; 3. To remove the requirement to the chapter on Synchronous Power Generating Units because it is relevant only to synchronous generating units.

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	Technical justification to delete are in particular: 1. This leads to extreme reduction of the lifetime of the turbine, generator, bus duct and other power plant equipment. Health and safety of power plant personnel is extremely endangered by this requirement. 2. For new builds an oversized plant is needed in order to meet these requirements, this will have a negative effect on the fuel efficiency and the investment levels. 3. Human safety, protection of environment and protection of equipment will always allow all protective measures (including automatic disconnection from the Network) to prevent and / or minimize any damage. Limited due to technical feasibility and physical reasons
Evaluation	Disagree
Justification	The requirement has been deleted in order to capture this as a national issue. This decision does not suggest that ENTSO-E indicates that the capability defined in the consultation version is not required.

Issue	**Technical capabilities for Black Start**
Section	Article 9 (5) a
Proposal received	Black Start Capability of a PGF is the result of a bilateral agreement. Costs due to the implementation of Black Start Capability and/or costs for testing the Black Start Capability have to be recovered and shall be borne by the party who asks for this implementation. According to the ACER Framework Guidelines on Electricity Grid Connections §2.1.3, this service cannot be unilaterally imposed but needs a contractually agreed basis. This provision applies also for house load and island operation.
Evaluation	Partially agree
Justification	The draft code of 24 Jan. 2012 did emphasize black start capability is non mandatory. To focus on the essence of how to set this optional requirement, the clause has been revised to focus on the right of the Relevant TSO to obtain quotes from Power Generating Facility Owners. The actual arrangement conditions for compensation are not prescribed/impeded by this code.

Issue	**Consideration of availability of fuel, water or other primary resources for Black Start Capability**
Section	Article 9 (5) a
Proposal received	Besides the range of needed power, the availability of the corresponding amount of energy such as water in the upper reservoir or fuel is needed. The Relevant Network Operator and the Power Generating Facility Operator shall organize the amount and storage issues contractually. Otherwise the relevant amount of energy could not be available. In case of a gas fired power plant, gas supply from the gas grid will be necessary. This article would exclude gas fired plants for Black Start. Wind and solar based PPMs have no inherent Black start capabilities. Technically unfeasible to resynchronize wind PPMs with the grid reference without auxiliary generation.
Evaluation	Disagree
Justification	Gas-fired units are not excluded, because fuel can be stored on site. External supply to the PGF site from the public grid is considered a non-reliable source for the goal of this requirement. Black start capability from wind / solar is technically excluded ex ante. Again, based on the eventual quote and the specific procurement of the service (not specified in this code), the techno-economic arguments will be taken into considerations. The same counts for Island operation.

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Issue	**Island operation / Ancillary Service**
Section	Article 9(5)b
Proposal received	If the maximum reduction of the actual load is not sufficient to leave the power surplus in the grid, frequency will raise and a disconnection due to overfrequency is mandatory. In that case the Generating Unit cannot be forced to stay on the Grid, because human safety, environment and equipment would be seriously endangered. According to ACER Framework Guidelines on Electricity Connections §1.3 this is an ancillary service and has to be contractually agreed.
Evaluation	Agree
Justification	Disconnection due to overfrequency is deleted, as it is not a requirement in itself, but an envisaged goal. The prescriptions on loading reduction of the PGM remain.

Issue	**Island operation / Identification of Island**
Section	Article 9 (5) b
Proposal received	Many comments for clarification were given on the transition from interconnected system operation to Island operation.
Evaluation	Agree
Justification	Clarification is given by amending with „The detection method shall be agreed between the generating unit and the TSO.” In addition the code clarifies that for detection of Island operation the PGF cannot solely rely on the Network Operator’s switchgear signals. It may be used as additional information.

Issue	**Island Operation - clarification on Speed and Level of Load reduction**
Section	Article 9 (5) b
Proposal received	Difference between normal FSM and FSM in Island operation?
Evaluation	Partially agree
Justification	FSM in normal operation is a market product that may not be in service for a specific PGM at a given time; FSM in islanding operation is a "last resort measure", justifying a more onerous requirement. The phrase "This load reduction shall prevent the disconnection of the Generating Unit from the island due to overfrequency." is deleted as strictly speaking the obligation is unreasonably strong.

Issue	**Quick re-synchronization capability / Switchgear Position Signals**
Section	Article 9 (5) c
Proposal received	The minimum time is limited by technical restrictions. The well-functioning existing rules should be sufficient. By deciding the minimum operating time, the Power Generating Unit Owners opinion should be taken into account as well as the Consideration of Safety Rules, too (external auxiliary connections are not available. This is imposed by nuclear safety rules). This requirement has also a commercial character due to the fact that operation of the Power Plant in houseload causes costs.
Evaluation	Agree
Justification	Subparagraphs (2), (3) and (4) are revised, to clarify the use of switchgear position signals (of the PGF and the Network Operator), the technical characteristics of the prime mover and to remove confusion on the mentioned automatic behavior

Issue	**Re-synchronization after tripping onto auxiliary supply**

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Section	Article 9 (5) d
Proposal received	Over specified, no need for this requirement, it's neither a cross border issue nor relevant for harmonization. Besides, Synchronization can also be done between generator and step-up transformer.
Evaluation	Agree
Justification	Art 9(5)(d) is deleted.

Issue	**Protection Schemes and Settings**
Section	Article 9 (6) b
Proposal received	• The RNO shall define the settings necessary to protect the Network taking into account the characteristics of the PGF. The priority for the definition of protection settings within the generator protection system must be the protection of the generating unit and its staff. • This updated clause should also apply to Type B units as coordination of protection settings will be necessary to prevent widespread tripping for system frequency or voltage events. • Is the list supposed to be a recommendation or requirement? a) If a requirement, then replace ""can"" with "must"" b) If a recommendation, then replace "It is recommended that the following protection functions are implemented"
Evaluation	Partly agree
Justification	• The coordination of the protection settings between PGF owner and RNO is necessary for the system security. The network protection is in the responsibility of the RNO. The PGF owner/operator is responsible for Generator protection. A ranking between generator and network protection is not the aim of the paragraph. However, as the code sets a design requirement a general prescription is added stating "The protection schemes and settings for internal electrical faults shall be designed not to jeopardize the performance of a Power Generating Module according to this Network Code requirements otherwise." • The requirement is shifted from Type C to Type B units in the final version of the NC acknowledging the concerns raised.. • Subparagraph 9 (6) b (3) shall be understood as a "can" requirement. Therefore it is very open for adding or leaving protection functionalities. Inter-area oscillations and power swings are no protection functions.

Issue	**Issues regarding health, personnel safety**
Section	Article 9 (6) c
Proposal received	With regard to priority ranking of protection and control, the Power Generating Facility shall organize their protections and control devices in compliance with the following priority ranking, organized in decreasing order of importance: - **Nuclear Safety** - **Safety to persons** - Generating Unit protection - Network system protection - Synthetic Inertia, if applicable - Power Restriction - Power gradient constraint - Frequency control (Active Power adjustment).
Evaluation	Partly agree
Justification	The importance of nuclear safety and health and safety prescriptions for personnel are acknowledged. This connection code prescribes that both need to be considered in the design phase, not requesting a priority ranking with these. Further explanation is given in FAQ …

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Issue	**Loss of Stability**
Section	Article 9 (6) d
Proposal received	Loss of stability of a generating unit can result in severe damage both electrically and mechanically to a Generating Unit. The criteria established by decision of the Relevant Network Operator will necessarily prioritize overall system stability and may inadvertently result in less than satisfactory protection for the Generating Unit. This would be in contradiction with Clauses 9.6.b.2 and 9.6.c.
Evaluation	Agree
Justification	Subparagraph 9 (6) d is deleted. The remaining prescriptions of electrical protection are shifted from type C to type B.

Issue	**Proportionality of Requirement "Instrumentation"**
Section	Article 9 (6) e
Proposal received	• This equipment can be installed and operated by the Relevant Network Operator at the Grid Connection Point. TSO as well as PGF Owner shall have the freedom to measure all desired values on grid connection point on their own responsibility and costs. Settings, triggering criteria etc. are irrelevant to the PGF. This criterion is e.g. something for the Network Code on System Operation and has nothing to do with this Network Code. • Dynamic system behavior monitoring is in the scope of the TSO and should be implemented on a higher system level.
Evaluation	Disagree
Justification	Due to growing dispersed generation more capability for measuring and monitoring is needed for smaller units too in order to assess the system behavior. The contribution of every unit of Type C is of importance in this context; therefore, these units are required to be equipped with instrumentation devices.

Issue	**Regulation of Technical Specifications like Sampling rate, triggering / Access to Information of Fault Recording**
Section	Article 9 (6) e
Proposal received	It should be avoided that a regulation of technical specifications (e.g. sampling rates) will finally define the producer of a device. Demands on sampling rates and so on can only refer to state of the art and availability on an industrial basis (not research and development). For electrical protection trigger and sampling rates depend on the device and the settings of protection functions. In all cases, ownership boundaries and rights of the generation owner must be respected and taken into consideration. Relevant operator must not take decisions unilaterally, which affects the Power Generating Facility.
Evaluation	Disagree
Justification	The PGF owner is involved in agreement with the RNO and coordination with the Relevant TSO to define the settings of the instrumentation. Access to information is to be in line with the Article on Confidentiality.

Issue	**Simulation and Protection Models / Set of Sub models**
Section	Article 9 (6) f
Proposal received	• Each Network Operator in coordination with the Relevant TSO shall decide which models are necessary. --> Remove point. • Depth of simulation including prime mover is too high. Each Network Operator in

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	coordination with the relevant TSO shall decide which models are necessary. • ENTSOE should justify the need for protection models. From EDF's point of view, observing the incoming signals through the adequate protections is enough.
Evaluation	Disagree
Justification	• The complete set of mentioned sub-models are basic elements for compliance simulations, grid connection studies, grid development plans and operational issues. • The protection behavior influences significantly the overall behavior of the GU; there is a general need of protection models. Note this is pursuant to an agreement between RNO and PGF owner.

Issue	**Simulation and Protection Models / Standardization and Confidentiality**
Section	Article 9 (6)f
Proposal received	Models are used by the Relevant TSOs to carry out computer simulations of Generating Unit behavior. There is no standardization of computer software modeling programs across the TSOs in Europe and many such programs are in use. To provide validated, detailed models in each software program would be very expensive for new units and for existing units, especially older units, technically impossible. Equally, the Relevant TSO will not want to receive models in uncommon formats requiring time and effort to be translated into the software program in use. There exists international standards and formats (i.e. Laplace representation) for Generating Unit models. It must be required, that where the Relevant TSO requests models of the Generating Unit, it is requested in those standardized formats rather than in proprietary and numerous software packages.
Evaluation	Disagree
Justification	The standardization of simulation models of PGM and protection models is not in the scope of this NC and not task of the Network Operators; It is a joint work to be done by standardization bodies, e.g. IEEE. This network code states the basic functional requirements of which types are needed and how these will be described in further detail. It is acknowledged that the compatibility of different software tools is not ideal at moment, there is still a lot of work to be done in this field, e.g. to develop an exchange format for dynamic models and to develop "black box" or "generic" models in order to ensure confidentiality.

Issue	**Simulation Models / Comparison with Generator Recordings**
Section	Article 9 (6) f
Proposal received	To avoid unnecessary costs and discrimination, recordings of the response of the Generating Unit should only be required where it is demonstrated by the Relevant TSO and agreed by the PGF that there is a significant unexpected behavior from a Generating Unit. Please consider that models are an approximation of real life performance. The dynamic response of a Generating Unit is driven by the behavior of the wider Network as well as the response of its own control systems. It is probable that due to the approximations inherent in the models of all Network elements including PGFs, some discrepancy will always exist in the response of the PGF in an idealized computer simulation and the response of the PGF when part of the dynamic response to a system disturbance.
Evaluation	Disagree
Justification	Event recordings are the only possibility to compare real Generating unit behavior with the simulation model output; therefore there is a need to deliver the recordings to the Network operator. No alternative is proposed, but the disclaimer is noted.

Issue	**Simulation Models / general comments**
Section	Article 9(6)f

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Proposal received	• A Generating Unit cannot provide such data, but a Power Generating Facility Owner can provide this for a Power Generating Facility resp. its Units. • Detailed Block diagram and structure representation forces manufacturers of generators to reveal sensitive know-how and compromises competitive developments of technology and the inherent right to protect this. The proposed version removes the requirement to provide block diagrams to protect intellectual property. • As requirements are defined per generating facility also models need to be required from the PGF not from single GUs. • Model data can only be required for functionalities that are implemented. Additionally please clarify if the Relevant Network Operator expects a model of the Power Generating Facility at the Connection Point, or if model(s) are expected from the individual Generating Unit(s).
Evaluation	Partly agree
Justification	• Taking into account the comments given the subparagraphs 9 (6) F (1) & (2) were revised. • For compliance simulations the PGF owner shall provide both a model of the single GU and an equivalent of the PGM. Note however, that requirements are set for PGMs, but at the connection point. • For confidentiality clauses, please refer to Art. 6. • The equivalent of the PGM can be used for grid development studies, for synchronous PGFs an equivalent model is not usual and needed for grid development studies. • Sub-models shall be provided depending on the existence of the mentioned components, alternator and speed controller are not necessary for a PV plant. The text is clarified in this respect.

Issue	**TSO Data for Simulation Models**
Section	Article 9(6)f
Proposal received	• The following text should be added "A network model that can be used in simulation studies shall be delivered from the Relevant Network Operator on request of the Generating Unit." • Here a network model should be possible to be delivered from the Relevant Network Operator that can be used in the studies.
Evaluation	Partly agree
Justification	A new subparagraph was introduced in the NC, requiring the RNO to provide the basic Network information for simulation models: “The Relevant Network Operator shall deliver to the Power Generating Facility Owner an estimate of the minimum and maximum short circuit capacity at the connection point, expressed in MVA, as an equivalent of the Network.” This information is also relevant with respect to compliance simulations, performed by the PGF owner.

Issue	**Devices for System Operation and/or Security**
Section	Article 9(6)g

Proposal received	• Clarification of responsibilities of allocation of costs needs to include.
	• "The Relevant Network Owner or Relevant TSO has the responsibility to develop the Network in order to preserve system operation or security. The PGF Owner must consider the safe operation and protection of the PGF foremost. The lines of responsibility for the system and ownership of system assets should not be confused.
	• It is necessary to provide protection to the PGF that this clause cannot be enforced where
	  ○ There exists the potential for damage to or loss of production from the PGF as a result of the installation or activation of the additional devices.
	  ○ The additional devices can be installed on the Network rather than on the

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	site of the PGF.
Evaluation	Disagree
Justification	• Cost allocations are out of the scope of this network code. • Potential damage of the Generating Unit and placement of the devices is subject to further the assessment by the PGF owner. • When considering an additional device to be necessary, the RNO is always obliged to justify the requirement. In addition the code states that the PGF owner and RNO have to agree on an appropriate solution, which acknowledges the case-specific details and the in-depth knowledge of the PGF owner on his installation that is essential to come to this appropriate solution.

Issue	**Rates of Change of Active Power**
Section	Article 9 (6) h
Proposal received	• Not acceptable unless it is understood that the mentioned minimum rate is a capability. The unit must be able to ramp at or above that minimum rate if required, but does not have to ramp at that rate at all times. For ramping actions initiated by the energy management center of the PGF Owner in order to re-assign output in a portfolio of units, a minimum ramping requirement should not be enforced. The slower they ramp, the better the balance in the network can be maintained. • Minimum and maximum limits on rates (ramping limits) of change of active power output are already defined in this code. Using prime mover technology can only be used if a CBA turns out that it is profitable to invest. Specifying rates of change of generating unit output should be specified, via the manufacturer, by the Generating Company, not by the TSO. • Such a definition, if challenged by the facility owner, shall be subject to a cost-based analysis and include the impact on all plant items (boiler, balance of plant). Such limits shall be non-discriminatory. • The gradients of load variation are the responsibility of manufacturers and producers. The definition of the limit values must be in accordance with all stakeholders. • The members of ENTSO-E will no doubt have carried out modeling of their control areas into the long term future and should be able to state the approximate required ramping limits for each synchronous area. These ramping limits should be published in both the Network Code for Requirements for Grid Connection and the subsequent Network Code for System Operation.
Evaluation	Disagree
Justification	• The requirement is needed for both minimum and maximum rates of change of active power. A limitation of maximum rates is needed in control areas with high wind penetration, in particular if a storm front comes up. • The requirement does not refer to FSM, it refers to system balancing. • Cost based analysis is included in the consideration of specifics of the prime mover technology. • The specific rate of change of active power strongly depends on prime mover technology. Because of non-discrimination no agreement with specific PGF owners will apply. • The harmonization of rates of change of active power is not the subject of this connection code and does not consider the specifics of the prime mover technology as acknowledged in this clause and by other comments provided.

Issue	**Earthing of Step-Up-Transformer**
Section	Article 9 (6) i

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Proposal received	• Delete because it is no cross-border network issue. This amendment is justified by the general remarks for the scope. • It is not possible to change the earthing arrangement of the neutral point of a generator step up transformer from solidly earthed, for example, to isolate unless the transformer was manufactured with this requirement specified. The capability cannot be retrofitted to existing equipment. It would be necessary to replace the transformer. Thus for existing units, the earthing requirements shall be in accordance with the specification at the time of purchase of the transformer. It is clear also that the TSO should only specify the earthing arrangements on the Network side of the generator step-up transformer. The earthing arrangements within the PGF are the responsibility of the PGF Owner.
Evaluation	Disagree
Justification	• The neutral point earthing refers to fault behaviour of the high voltage network which is a cross border issue. • The earthing of the internal network of the PGF does not influence the public network. • As for all requirements in the code, this requirement envisages new units. An application for an existing Generating unit is subject to an extended procedure including quantitative CBA to justify this.

Issue	**Harmonics and Power Quality**
Section	Article 9 (6) j
Proposal received	Harmonics are not recorded for synchronous Generators. There is no regular reason to monitor the harmonics. The monitoring of the harmonics is only justified for the PPM.
Evaluation	Agree
Justification	The monitoring of harmonics as a general requirement for PGM has been deleted as it is considered a local issue. Power/Voltage Quality are removed from the scope of the NC as it is considered a local issue.

Issue	**Spare Components**
Section	Article 9 (6) k
Proposal received	It is impossible for the bulk business to coordinate the exchange of every spare component which does not comply to the NC with the TSO. This means a high administrative effort and cost. This clause appears to give the Relevant Network Operator and Relevant TSO the right to deny replacement of an existing item of plant with its spare component. Such decisions don't come quickly and could apply to plant without redundancy. Who will pay for the lost production whilst this decision is made and a replacement system is sourced?
Evaluation	Disagree
Justification	This option is meant as the exception for the rule and therefore not a "bulk" business. An agreement on spare components is needed; otherwise this would be a "carte blanche" for pertaining non-compliance with this code, even in case of significant modernization/replacement.

Issue	**Modernization and Replacement of Equipment**
Section	Article 9 (6) k
Proposal received	• In case components (hardware or software) will change with identical components or with components identical in construction or identical in function which was already approved by the network operator and fulfilling the requirements not additional agreement is necessary. It is the responsibility of the Generator to fulfill the agreed requirements, as long as that is guaranteed there should be no issue. Generator should inform TSO only in the case that the new equipment will downgrade the

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	requirements. • The requirements are not defined at all. Precise clarification of criteria's is needed. The proposed text applies to all changes and all spare parts, so each substitution should to be approved. This is not feasible and reasonable. • New equipment/retro-fits/replants, as far as is practicable, shall be in line with the new code requirements. However, existing equipment not in the facility owner's project scope shall not be required to be replaced for the sole purpose of meeting new requirements. As the national law takes precedence here, it is not clear what is being achieved by this paragraph within the context of a common European standard. An overall statement, referring to the application of the national law for any items not explicitly referred to in the code would be a simpler approach.
Evaluation	Disagree
Justification	• The PGF owner is obliged to inform the RNO because a change of components may influence the electrical behavior and parameters of the PGF. A downgrade of requirements will be regarded as a request for derogation. • The PGF owner shall ensure that the Generating Unit (with new components) shall comply with the requirements; because a change of components may influence the electrical behavior and parameters of the PGF. A deletion of the two last sentences would open up downgrading of this code's requirements. • The requirement is not meant as general lifetime derogation; by installing new components either the requirement shall be fulfilled or a new derogation shall be applied for.

9.1	U/f/P/t Figure is needed to see how U and f requirements are to be combined	disagree	The requested information is included in Tables 2, 6.1 and 6.2. See also FAQ 20 for explanation on how to combine f and U requirements for Type D units. In addition, for Type C units voltage specifications are to be determined on national level, not in this code. The objective of the Network Code is not to develop a comprehensive design manual, but focuses only on requirements relevant from a cross-border perspective.
9.1	Active Power controllability for Type C units - The Type A requirement with a logic interface should not be excluded for Type C units.	disagree	Exclusion of Article 7(1)d shall remain. Active Power controllability is different for Type A, Type B and Type C units as reflected in this Article.
9.2.a.1	Active Power controllability for Type C Units - remote control may not always be acceptable	disagree	The NC sets technical capabilities. When and how to use the capabilities is out of scope of the NC. Remuneration of ancillary services is not within the scope of the NC. Internal restrictions of the PGFs must be considered during operation. Wording of the requirement is clarified to focus on the capability, the availability of the prime mover and on the way Instructions can be set.

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9.2.a.2	Clarification needed on the deviation between scheduled and actual value of steady state load	agree	Wording is revised so that technical limitations are considered and that the capability needs to be present. Not all comments give clear proposals. Wording is changed for Scheduled value to Setpoint of Active Power, actual Active Power, steady-state condition. However, technical capabilities are not potentially discriminating, only the use of them. Deviation between actual Active Power and the scheduled value should be defined by the Relevant Network Operator taking into account technology and system needs.
9.2.a.1	Clarification needed on remote control of active power for Type C Units	partially agree	- Procurement is out of scope of the NC. - The implementation period of a sent Setpoint value cannot be negotiated due to system security. - Regarding Remote Control: If automatic control for any reason is unavailable, manual backup should be available. - Although benefits of standardised equipment is acknowledged, this is not a cross-border issue and network operators' specific needs have to be taken into account. From the perspective of a functional description, this code will not restrict/impede/promote certain standards. - When setting the implementation period for a Setpoint, technology issues must be considered. The wording of the requirement is improved accordingly.
9.2.a.1	direct remote control	agree	The requirement is improved to clarify that remote control of Active Power directly by the Network Operator is not intended.
9.2.a.2	editorial	agree	Wording is revised accordingly.
9.2.a.2	Need for metering	disagree	Metering of energy is out of the scope of this NC
9.2.a.1	Implementation Costs	disagree	cost allocation or commercial arrangements are out of scope of this Network Code.
9.2.a.1	Remote Control Cyber security risks - restrictions from where remote control can be used, PGF control room, RNO control room, etc…?	agree	The requirement focuses on a capability which needs to be implemented in the PGM. Further communication or use of this capability is not in the scope of this Network Code. Wording is revised to clarify this.
9.2.a.2	editorial	agree	Wording is revised accordingly.
9.2.b	Providing inertia is physically not possible, needs a better description of the intended capability.	agree	The requirement is removed as general requirement for all type C PGMs.

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9.0	Scope of the Art. 9 requirements - application to generating unit or power generating facility	partially agree	In principle, requirements defined in this Network Code apply to the unit (now renamed Power Generating Module), unless explicitly specified.
9.2	Possibility to obtain of FSM-U (and FRC) response from other generating units. FSM-U and RFC are to be subject to an Ancillary Service Agreement	disagree	This grid connection code states basic mandatory/optional requirements in order to assure that basic capabilities are available in operational conditions and market procurement in the decades to come. In this respect see also the published paper entitled “NC RfG in view of the future European electricity system and the Third Package network codes”
9.2	Request for CBA for LFSM-U and FRC	disagree	Further justification is provided in other supporting documents to this network code. Note that requirements on Frequency Restoration Control are to be defined while respecting the provisions of Art 4(3), in which justification is to be given.
9.2.c.1	Operational constraints of PGFs to participate in (L)FSM-U, incl. availability of primary energy resources and PPM operating below available power, need to be considered.	partially agree	The article has been improved to identify the restrictions of technologies to participate in FSM. It is clarified that in LFSM-U mode only Generating Units running below Maximum Capacity/available active power deliver Active Power Frequency Response. It is expected that the only the spare power (i.e. power between real or schedule) output power and Maximum Capacity) can be activated under LFSM-U. Whether under normal operation this headroom needs to be available depends on operational codes, national codes, market mechanisms, contracts, etc...
9.2.c.1	Harmonization of LFSM settings within synchronous zones	partially agree	This requirements prescribes the range within a PGM is able to activate a LFSM-U response. The actual setting is an operational decision (coordinated within a synchronous area), and out of scope of this connection code. The wording has been improved to clarify this.
9.2.c.1	LFSM-U editorial - merging of two paragraphs	agree	Wording is revised accordingly.
9.2.c.1	Clarification needed on the reference active power for variable primary energy source generation operated under LFSM-U, on which theActive Power increase or reduction is based.	agree	The reference active power for LFSM-U has been more precisely specified. "The LFSM-U reference Active Power shall be the Active Power output at the moment of activation of LFSM-U and shall not be changed unless triggered by frequency restoration action."
9.2.c.1	Clarifications and editorial changes: relation between LFSM-under and LFSM-over	partially agree	Generation Modules in LFSM-U operation should also be capable of LFSM-O mode. Text has been reworded accordingly to avoid misunderstanding.

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9.2.c.1	Dynamic parameters for LFSM-U are not precise enough or are too strict.	disagree	A delay of 2 seconds for Active Power Frequency is considered enough for avoiding unintentional islanding. Recommendation in comments of 5 sec delay time is too long and not sufficient for disturbances in the system resulted with high rate of change of frequency. Dynamic parameters for Active Power Frequency Response as well as delivery time under LFSM-U will not be more precise defined as it relates to various technology and various operational conditions to be taken into account. It is not possible to define more precise requirements on European level without prejudice to technical feasibility.
9.2.c.1	proper operation of RoCoF protection in context of LFSM-U operation	disagree	LFSM-U requirements as defined in section 9.2.c cannot be moved to Type D. The rate of change of Active Power Response under LFSM-U has to be coordinated with RoCoF protection settings. According to priority ranking of protection defined in this Network Code, Generating Unit protection has the highest priority. See 'electrical protection schemes and settings' for type B PGMs.
9.2.c.1	Direct linkage between speed and power control in (L)FSM exists only for synchronous generators.	agree	Requirement is improved to focus on stable operation, without direct reference to relation between speed and power control.
9.2.c.1	Static parameters of LFSM-U have a too wide range of parameters. Choice of parameters within bilateral agreements expected. Reference point should be P availabe instead of P max, especially in the context of renewables.	partially agree	More detailed parameters (e.g. sensitivity, deadband) for LFSM-U can be defined on national level. Some basic LFSM-U settings cannot be subject to mutual agreements since they will have impact on the power system. The settings must reflect the system needs and will be defined by the TSO, taking into account technology restrictions. The responsibility for frequency response (incl. settings) lies with the TSO, not with the PGFs. It is agreed that the s2 gradient may be different at the ascent (LFSM-U) or descent (LFSM-O), Fig 1 and 2, as both can be adjusted individually in the range of 2 - 12%. The definition of droop will be improved to avoid misunderstanding. It is expected that the whole range of active power between real(scheduled) output power and Maximum Capacity can be activated under LFSM-U. Generating Units running below Maximum Capacity (or available power) shall be able to activate Active Power Frequency Response. The reference point of Pmax is maintained, in line with present practices for LFSM-U for conventional generation.

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9.2.d.1	Relation between LFSM and FSM is not clear.	agree	Wording has been revised. Type C Power Generation Modules in LFSM operation should also be capable of FSM mode. Both capabilities are superposed.
9.2.d.1	possibility to obtain of FSM response from other generating units under the Ancillary Service Agreement	disagree	This grid connection code states basic mandatory/optional requirements in order to assure that basic capabilities are available in operational conditions and market procurement in the decades to come. In this respect see also the published paper entitled “NC RfG in view of the future European electricity system and the Third Package network codes”
9.2.d.1	Limiters for FSM: active power range or Maximum Capacity/Minimum Regulating Level	agree	Limits are acknowledged by addressing "limitations on operation near Maximum Capacity at low frequencies according to Article 8(1) (e) and available primary energy sources."
9.2.d.1	Validity of FSM requirements for Type C / request for CBA according to FWGL	disagree	Further justification is provided in other supporting documents to this network code.
9.2.d.1	Description of FSM/LFSM figures and tables are not clear	partially agree	The figures and tables have been modified to improve clarity. Note that the frequency step which activates the full Active Power Frequency Response depends on the selected droop (as well Active Power range) and cannot be defined in the NC as one value.
9.2.d	Harmonization of the FSM settings within synchronous zones	agree	It is likely that the setting will be coordinated within a synchronous area, but this is an operational issue out of the scope of this Network Code.
9.2.d.4	More precise procedure of reselection of FSM droop and deadband by TSO expected including e.g an advance notice of 6 month	disagree	Droop and deadband settings are critical items for system security to be defined by the TSO in order to ensure system stability. As quick procedures may be needed, no reference is made to the procedure as referred to in Art 4(3). This still allows for other procedures to be set at national level.
9.2.d.7	Relation between frequency control and power control is unclear and does not suit to renewables.	partially agree	Wording has been revised to clarify. Availability of primary resources is reflected in the requirement. Eventual use of the service is not in scope of this code.
9.2.d.8	Capability to select the frequency target (49,99/50,01) nowadays is not justified on a wide European level.	agree	The capability has been removed.
9.2.e	The content of Frequency Restoration Control rules need to be specified for offshore HVDC connections.	partially agree	It is acknowledged that other details may be considered for DC connections. However, offshore DC connections have been removed from the scope of this code, to be taken up in a future dedicated HVDC connection code.

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9.2.e	More precise requirements for FRC are expected. Now the existing provision is too general.	disagree	No further clarification is needed. More precise and detailed data have to be specified by TSOs taking into account the existing rules within synchronous areas and national level, as well as the power system structure.
9.2.e	It is the responsibility of the PGF owner to maintain the power exchange flow with regards to the Frequency Restoration Control requirement.	disagree	Possibly a misunderstanding. Maintaining transmission system flows is a TSO action and responsibility but this process is realized by PGF. Within FRC TSO transmit the setpoint to the PGF to change the active power output. This setpoint is calculated on the basis of data (incl. power flow) available to TSOs. To participate in FRC, the PGF owner needs to receive the setpoint sent by TSO.
9.2.e	Lack of basic requirements as a framework for TSOs in context of FRC (maximum-minimum requirements)	disagree	FRC now sees a variety of now existing solutions throughout European systems. FRC is not standardized product. The aim of this Network Code is to oblige PGF owners to have a basic capability for FRC participation, not to specify a given technical implementation throughout Europe.
9.2.f	Capability of a PGF, able to act as load, to disconnect within unlimited time/frequency range as a management/ancillary service.	disagree	Like for all other frequency thresholds for Active Power response, the Relevant TSO shall define these based on the imminent impact on system security and the need to adjust them quickly without a lengthy procedure in case of change of system characteristics. Ancillary service arrangements are out of the scope of this network code.
9.2.g	Difficulties to calculate PPM available power required for monitoring PPM's participated in FSM	agree	Point is deleted, because it is very difficult, if not impossible to monitor in real-time available power (not only for Power Park Modules, but in general).
9.2.g	Right of TSO to make unilateral decision (without consent of PGF owner) to require additional signals for FSM monitoring.	disagree	Only the minimum required signals are defined by this Network Code, with specifications of additional signals to be taken while respecting the provisions of Art 4(3), which includes, as the case may be, involvement of the PGF owner.
9.2.g	Data transmission system for monitoring of FSM has to ensure cyber security risk (esp. for NPP) and more precise data for monitoring of FSM are expected	partially agree	Requirements cover data transmission from the PGF to the RNO only. IT-Security concerns are acknowledged and should be dealt with appropriately, but this is not in the scope of a generator connection code. In addition this requirement is considered to be not a significant change from already implemented data provisions. More precise data incl. accuracy, response time will be specified by each RNO, while respecting the provisions of Art 4(3).
9.2.g	Transmission of setpoint value for LFC does not address monitoring of FSM	agree	The requirement is deleted, because it is relevant for Secondary Control (as applied e. g. in the CE synchronous area), but Secondary Control itself is not a requirement of this Network Code.

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9.3.a	Compliance with IEC standards for voltage ranges at which the unit should be capable to disconnect. The thresholds for disconnection should be agreed with PGF owner.	partially agree	Requirement is improved by specifying the point of voltage measurement (grid connection point). IEC standards are not directly referred to, as is no standard throughout the code because of legal implications. The specification of voltages is amended by 'while respecting the provisions of Art 4(3)'. Note that in principle the settings of thresholds to disconnect are within the ranges at which the PGM should be able to operate.
9.4.a	PSS operation in context of stability requirements of PGU in case of power oscillations - Clarification is needed, especially to make it possible for the PSS to reduce the power. Stable operation should be required only above minimum regulating level.	partially agree	The text has been revised for clarification. However, this requirement is not against PSS action. Stable operation has to be ensured always, also below minimum operating level, especially during houseload operation.
9.4.a	Right of PGF owner to disconnect of PGU due to safety reasons in context of stability requirements of PGU due to power oscillations.	disagree	Ranking of electrical protection is given in a general type B requirement. Other safety issues need to be dealt with in parallel in the design phase.
9.4.c	Auto-reclosures requirement - depending on the quality of network protection equipment and automation, this may lead to extreme and destructing values in currents, etc.	agree	Auto-reclosures on radial connection lines are no longer required, focus is on meshed Networks. Auto-reclosures on network lines, if applicable, shall be withstood, however the respective protection schemes and settings shall be subjects to the provisions on agreements on such schemes.
9.4.a	Stability of GU in context of power oscillations is not clear.	agree	The text has been revised taking into consideration the raised technical aspects. Reference is made to "notwithstanding the provisions of Article 8(1) (e), as long as Voltage and Frequency remain within the admissible limits pursuant to this Network Code." in the requirement to remain connected and maintain active power output.
9.5	Cost allocation for System Restoration	disagree	Costs allocation or specifics on procurement of services are not in the scope of the NC.
9.5	Active power output range for frequency control under black start conditions	agree	Active power range will be specified as the range between Minimum Regulating Level and Maximum Capacity.
9.5	Active Power Response speed to follow BDEW value	partially agree	Even if there is no argumentation given why to follow this rule, the mentioned activation speeds are within the ranges of Table 5.
9.5	In-rush Current protection of Generating Units under black start conditions	agree	In-rush currents requirement is deleted from the voltage regulation requirement under Black Start. In-rush is added to the list of protection aspects for type B units.
9.5	Clarification on a predefined Network part for Energisation under Black Start	agree	Revised test resolves the issue.

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9.5	Voltage Limits for Black Start not clear	agree	Reference to paragraph 3 deleted as the specification for Type C units is done by the Relevant NO and for Type D units according to article 11(2)
9.5	Generator Capability for Regulating Voltage Dips needs to be within the generator's capability.	agree	This is covered by 'within the Frequency limits defined in Article 8(1) and Voltage limits defined by the Relevant Network Operator or defined by Article 11(2) where applicable.' in the preceding paragraph.
9.5	Responsibility for Black Start on RNO or Relevant TSO	disagree	Responsibilities are appropriately allocated as a TSO responsibility, respecting the voltage limits imposed by the RNO.
9.5	Synchronisation of Network Parts during System Restoration cannot be the responsibility of the PGF owner, as the breaker between Network parts is not in his control/responsibility.	agree	Wording clarified accordingly.
9.5	Monitoring of components during Black start require further specifications.	disagree	Comment contains too much detail for a European Network Code.
9.5	Synchronisation Procedure between Networks missing	partially agree	Comment accepted, but due to revision of the requirement this is resolved. Energisation details are covered in the compliance test.
9.5	Black Start Capabilities refers to Generating Unit and not to the connection point.	disagree	For black start situations the TSO needs to know the specific characteristics of the units used.
9.5	Ancillary Services are not specified.	disagree	This grid connection code states basic mandatory/optional requirements in order to assure that basic capabilities are available in operational conditions and market procurement in the decades to come. In this respect see also the published paper entitled “NC RfG in view of the future European electricity system and the Third Package network codes”
9.5	Switchgear Position Signals / Island Detection	partially agree	Switchgear position signals cannot be solely relied on. However, it is clarified that this refers to the Network Operator's switchgear.
9.5	Weather situation for Load Reduction down to 55% Maximum Capacity need to be considered.	agree	Maximum Capacity depends on environmental conditions, which can be considered in the Connection Agreement which specifies the Maximum Capacity. The commented requirement is not adapted.
9.5	Load Reduction down to 55% Maximum Capacity should be rephrased in terms of Active Power output	agree	"at least a Active Power output reduction to 55 % of its Maximum Capacity shall be possible."
9.5	Short Circuit Power of The Network for stable PPM Operation is needed.	disagree	A Network Operator cannot guarantee specific instantaneous short-circuit power levels.
9.5	Island Operation and Quick Re-Synchronisation / Exemption for NPP	disagree	Comment focuses on existing installations which are not the focus of this Network Code. For new units the requirement is deemed feasible and justified.

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9.5	Islanding within capabilities of Maximum Active Power output instead of the PQ- Capability Diagram	disagree	The requirement already states 'as much as inherently technically feasible'.
9.5	Island Operation by contractual arrangements and taking into account safety requirements.	partially agree	Safety concerns are to be dealt with in the design phase, as this is a connection agreement. No prejudice is made over contractual arrangements or the implementation by the provisions of Art 4(3).
9.5	Island Operation - The frequency depends on the overall behaviour of the connected plants. Only this overall behaviour is able to stabilize the frequency.	disagree	Output reduction to a level of 55% is necessary. Speed behaviour for load reduction is too detailed to be covered.
9.5	Island Operation detection - clarification on 'required behaviour'	agree	Wording revised.
9.5	System restoration / resynchronization capabilities not possible for PPMs	disagree	For Wind Energy Converters 15 min are not exceeded. As such, houseload operation for PPM does not apply.
9.6	Appropriate synchronization Frequencies are to be decided by the PGF owner.	disagree	Synchronization must be possible in extreme grid situations (e.g. system split) at "unusual" frequencies, within the ranges of Table 2. Note that the requirement has been shifted to type D PGMs.
9.6	Settings for Synchronization / more details required in coordinated settings across a synchronous area.	disagree	Too detailed in the context of this Network Code. In addition settings are to be agreed always with the PGF owner.
9.6	Settings for Synchronization / depending on the technology used, not all parameters may be possible, e.g. Voltage in case of permanent magnet generators.	disagree	Specifics for voltage are subject of the "written" agreement between RNO and the PGF Owner
9.6	Synchronization requirements are to be restricted to those participating in Island operation services.	disagree	Synchronization is a general requirement, covering all possible operational conditions, and it does not exclusively refer to island operation. Note that it has shifted to type D requirements.
9.6	Synchronization / Not in line with present practices where wind generators are often allowed to reconnect automatically.	partially agree	The requirement is shifted from Type C to Type D units.
9.6	Access to Measurement Equipment needs to be ensured for the PGF owner, e.g. instrument transformers at the high voltage side of the generator step-up transformer owned by the RNO	disagree	Access to the measurement equipment is not in the scope of this code.
9.6	Purpose of Electrical Protection - link with other NC requirements needed; should also be applicable as of type B units	agree	Wording revised; requirement shifted to type C PGMs.
9.6	Remove reference to Art 4(3) in electrical protection requirement and replace by general principles	partially agree	Principles of non-discrimination and proportionality are covered by Article 4 (3).

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9.6	Data exchange for protection should also include that each party provides the other one with its network topologies and both positive and zero sequence impedances of its network equipment in the vicinity of the interconnection.	disagree	Data for network topologies and parameters are not in the scope of this requirement or Network Code.
9.6	Priority Ranking of Protection and Control / Content	agree	Deletion of power gradient constraints; addition of capacity limit of the Connection Point.
9.6	Priority Ranking of Protection and Control / Differentiation of Frequency Control Modes	disagree	As the requirement is shifted to Type B this differentiation is not possible. LFSM-U, FSM do not apply for type B.
9.6	Definition of "Loss of Stability" is needed	disagree	Term has been removed altogether.
9.6	Confidentiality of Customer Data regarding Fault recording needs to be settled.	agree	This is covered by Art. 6 on Confidentiality obligations.
9.6	Installation of measuring device should be done by the RNO as the Connection Point is at the HV side mostly.	partially agree	Measurement at the connection point is ok, but it is common practice that the PGF owner installs the device.
9.6	Standardization of Protocols	partially agree	Benefits of standardization or proper exchange protocols are acknowledged. The NC describes only capabilities. Specification of protocols is up to standardization. No option is prescribed or impeded by the NC description.
9.6	Proportionality of Requirement "Instrumentation" regarding type size is questioned.	disagree	The comment describes a hypothetical example of a 1MW threshold for type C. Proportionality to users with respect to requirements is ensured in the setting of the thresholds.
9.6	TSO Data for Model validation - the Power Generating Facility Owner shall have the right to request from TSO recordings and information on events and transients in the network for being in position to compare the response of model and reality, and tune the models of the unit accordingly.	disagree	The request is reasonable but rather an operational issue and not a requirement for a generator. In reality a close collaboration will take place.
9.6	Simulation Models / request to delete the option of EMT - Simulations	disagree	As implied by 'where appropriate and justified' EMT- Simulations are the exception. Usually RMS-Simulations (50Hz component) will be performed.
9.6	Simulation Models / Costs	disagree	Cost allocation or reimbursement is out of the scope of this network code.
9.6	Proportionality of Requirement "Simulation Models"	disagree	Due to growing dispersed generation detailed models of Type C units are needed in order to assess the system behaviour. The contribution of every unit of Type C is of importance in this context.

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9.6	Limitations for Nuclear Power Plants	disagree	Prime mover technology includes reactor physics
9.6	Necessity of requirement "Rate of change of active power"	disagree	Statement is only a comment no proposal. This requirement is meant for unforeseen situations where fast action by the GU is needed in order to avoid an emergency situation.
9.6	Health and Safety Regarding Earthing	partially agree	Health and safety requirements are automatically covered by the specification of the RNO
9.6	Relation between Title 5 DEROGATION and § 9.6. k)		Spare components which do not comply with the code (9.6 k); in fact this is derogation according to Title 5 (Derogation)
9.6	Impact on the plant behaviour to be clarified	disagree	This is covered by "in case it is reasonable to foresee that these intended changes may be affected by the requirements of this Network Code"
9.6	Implementation of link to Article 4 (3) in headline	disagree	Article 4 (3) is always related to a single or a set of requirements and not to a headline of a paragraph.
9.6	Comment on decision of Network Operators		No link to a single requirement is seen.

ARTICLE 10 - GENERAL REQUIREMENTS FOR TYPE D POWER GENERATING UNITS

Note: Article 11 in the final Network Code

Issue	**Wide Voltage Ranges**
Section	Art. 10(2)a
Proposal received	• Continental Europe Voltage ranges restricted to 0.9-1.10 p.u. unlimited • Table 5.2: setting different voltage ranges for RES plants according to the capability of the generator. • The text shall be completed as "The values of Table 5.1. shall be followed as far as possible without installing On-load Tap Changer in Generator Step-up transformers". • To be added to Table 5.1: “The relevant TSO shall specify the number and duration of events for a given time frame, e.g. 1 year, based on his operational experience and predictions. The relevant TSO and nuclear power plant facility owner shall agree on time frames and upper and lower limits of voltage below 0.875 and over 1.05.”
Evaluation	Disagree
Justification	• Wide voltage ranges are not intended as means for normal system operation, but are crucial for system security in case of severe system events. More information is provided in FAQ 20 as well as in the other supporting documentation to this final Network Code. • The outer ranges are not representing normal operation, but refer to emergency

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	situations (islanding, sudden loss of line, …). Although acknowledged that voltage issues may be local and the voltage profile varies across a network topology, the prescribed voltage ranges in this requirement are relevant from a cross-border perspective to provide support in case of strong system perturbations. • This requirement focuses on new Generating Units. In case of retroactive application a full process needs to be followed as prescribe in Art. 33 of the final NC. As such, arguments on costly retrofitting are no valid argument against the overall requirement in this code.

Issue	**Lower Voltage Range between 0,8 and 0,85 p.u.**
Section	Article 10
Proposal received	We recommend deleting the lowest voltage level for Continental Europe: (0.80 < U < 0.85) and that the voltage level (0.85 < U < 0.90) should only long for a maximum of 30 minutes in tables 5.1 and 5.2.
Evaluation	Partly agree
Justification	Withstand capability for a voltage between 0.80 and 0.85 pu occurs only in rare cases, e.g. based on bilateral agreements. As such, this voltage range is removed from the general requirement for the synchronous areas of Continental Europe, as well as of the Baltics. In order to cover possible, justifiable exceptional cases, Art. 11(2)a.2 is added “While respecting the provisions of Article 4(3), wider Voltage ranges or longer minimum times for operation can be agreed between the Relevant Network Operator in coordination with the Relevant TSO and the Power Generating Facility Owner to ensure the best use of the technical capabilities of a Power Generating Module if needed to preserve or to restore system security. If wider Voltage ranges or longer minimum times for operation are economically and technically feasible, the consent of the Power Generating Facility Owner shall not be unreasonably withheld.” This is in line with a similar subclause for the frequency range requirement. The time period of the 0.85-0.90 pu voltage range is not restricted to 30minutes. The given requirement is in line with present practices. More information is provided in the supporting documentation.

Issue	**Compliance with EN 60038**
Section	Article 10
Proposal received	• Add: The voltage ranges of the grid voltage are according to EN 60038. Human safety, protection of environment or protection of equipment will always allow all protective measures (including automatic disconnection from the Network) to prevent any damage. • The voltage ranges must not contradict the voltage levels defined in the technical standard CENELEC EN 60038. In detail Maximum Voltage for Equipment is 123kV @ 110kV nominal voltage, 245kV @ 220kV, 420kV @ 380kV nominal voltage. • The voltage range is defined by the respective standards (IEC 61936-1 and IEC 60071-1). An overvoltage in continental Europe above 1.12pu for 110 kV violates the standard. (The standard has a maximum operational voltage of 123 kV or 1.12pu). An overvoltage on an overhead line usually will not damage the power line equipment. As a DSO using 110-kV-XLPE-cables it is not an option to run the system on 1.15 pu.
Evaluation	Partly Agree
Justification	The time period for the 1.118-1.15 p.u. range below 300kV is adjusted to 20 minutes. • The voltage ranges of tables 5.1. & 5.2 reflect reality in system operation. The ranges are in line with present transmission grid codes. • Cigré report "WG 33.10, Temporary Overvoltages: Withstand Characteristics of Extra High Voltage Equipment, Electra No.179 August 1998, pp. 39-45" shows a maximum

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	overvoltage to 1.15 p.u. for a period of 20 minutes based on test results. • Further argumentation is provided in supporting documentation.

Issue	**Considering of Overfluxing and Conditions for Disconnection**
Section	Article 10
Proposal received	• In case of a deviation of the Network voltage at the Connection Point from its nominal value with a rate of change smaller than 5%/min, any automatic disconnection from the Network of a Generating Unit, with a Connection Point at 110 kV or above, shall be prohibited due to the deviation within the voltage ranges, expressed by the voltage at the Connection Point related to nominal voltage (per unit), and within the time periods specified by tables 5.1 and 5.2 only if the frequency stays between +/-1% of nominal frequency. • ENTSO-E must define a U/f/P/t-figure for all voltages applicable. Alternatively, ENTSO-E should specify how National Codes shall specify U/f/P/t-figures and what information shall be included. The U/f-ratio (incl. duration) shall be specified (figure and text).
Evaluation	Disagree
Justification	• Protection against overfluxing is already covered in the protection schemes requirement as a “can” option (see Article 9 (6) b (3) • Terms and Settings for automatic disconnection from the network have to be agreed between PGF owner and RNO. The “non” steady state conditions for Fault Ride Through are covered by articles 10 (3) a and 8 (3) a. • Combination of U and f requirements are covered by FAQ …

Issue	**Coherence of Voltage Ranges and UQ-Diagram**
Section	Article 10
Proposal received	The voltage ranges have to be coherent with P/Q profile of fig. 6
Evaluation	Disagree
Justification	The inner envelope of the UQ-Diagram can flexibly be shifted. Therefore no fixed relation between Tables 5.1 & 5.2 and UQ-Diagram exists.

10.1	Nordic NPP to be excluded from type C houseload requirement with alternative proposal 'Nuclear power plants in Synchronous Area Nordic shall be designed for automatic disconnection from the external grid and entering houseload operation in case of a black-out in the external grid. The protection equipment and the control systems shall be set to enable this.'	disagree	Proposed is already in line with in article 9 (5) c 2.
10.1	Remote I/O interface exemption (type A requirement) to be removed from Art 10(1)	disagree	Other options are more suited for large units.
10.2	0.95 to 1.05 for unlimited operation	disagree	Wider range is needed to cope with severe system events. See also FAQ 20 and other supporting documentation of this Network Code.

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10.2	Add recommendation on On-Load-Tap Changers: "To minimize adverse effects on the generator from operation outside the nominal parameters (e.g. reduction in life of the generator) additional countermeasures can be taken. To meet the voltage range as required by the code and to increase the permissible range of generating unit operation without negative effect on grid voltage on-load tap changers can be used"	disagree	Clarifications are provided in supporting documentation (see FAQs and others). Recommendations are not prescribed in a Network Code.
10.2	Clarify which Table is required for 300 kV voltage level.	agree	Wording revised. Note that the Article numbering and table order have changed as well. The captions are clear with respect to 300kV now.
10.2	Combine the two Tables for Voltage Ranges	disagree	The two different tables reflect the situation in operation nowadays.
10.2	Refer to "Connection Point at the voltage limit or above,"	disagree	110kV reflects the nominal voltage.
10.2	No voltage Ranges defined for PGMs connected below 110kV.	agree	Observation is acknowledged. Voltage withstand capabilities below 110kV are deemed not relevant in the context of this code and are to be set by the RNO.
10.2	Editorial in Article title (Facility/Unit)	disagree	Requirements apply to the Power Generating Module (earlier indicated as Unit) at the connection point.
10.2	Exemption for generators in sensitive production processes (e.g. pulp industry)	partially agree	See newly introduced Art 3(6)g

ARTICLE 11 – REQUIREMENTS FOR TYPE B SYNCHRONOUS GENERATING UNITS

Note: Article 12 in the final Network Code

Issue	**Reactive Power capability requirements for Type B synchronous power generating modules**
Section	Article 11.2.a
Proposal received	Limit the power factor between 0.950 underexcitated and 0.925 overexcitated
Evaluation	Disagree
Justification	The Network Code gives the right to define to this capability to the Relevant Network Operator pursuant to the principles of Art 4(3).

Issue	**Fault-Ride-Through capability requirements for Type B synchronous power generating**

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	modules
Section	Article 11.3.a
Proposal received	1. Include in the network Code the need of reduction of the critical clearing time in transmission systems or improve general quality of supply (by new protection devices, underground cables instead of overhead lines, …) 2. Allow the trip of the synchronous generator as soon as 90% of the Critical Fault Clearing Time is expired 3. Add to the end "unless the protection scheme of the Power Generating Facility requires the disconnection of a Generating Unit from the Network" 4. The Relevant Network Operator shall deliver the parameters of the fault and the model of the network 5. The settings of the undervoltage protection must be specified by the Relevant Network Operator and agree between the Power Generating Facility owner and the Relevant Network Operator 6. The time for the recovery of the active power defined in the requirement is very low for several types of Power Generating Facilities
Evaluation	Partially agree
Justification	1. Out of the scope of a generator connection code. However, Art 4(1) still applies: "The requirements established in this Network Code and their applications are based on the principle of non-discrimination and transparency as well as the principle of optimisation between the highest overall efficiency and lowest total cost for all involved parties." 2. Critical Fault Clearing Time depends on operating conditions and cannot be used as a setting for FRT requirements. In planning of the system and connection studies this can be analysed offline which will likely result in the normal procedure of defining an FRT curve as envisaged in this requirement. 3. Principle acknowledged. Art 9(3)a.6 sets the coordination between both as "While still respecting Article 9(3) (a) point 5), undervoltage protection (either fault-ride-through capability or minimum Voltage defined at the connection point Voltage) shall be set by the Power Generating Facility Owner to the widest possible technical capability of the Power Generating Module unless the Relevant Network Operator requires less wide settings according to Article 9(5) (b). The settings shall be justified by the Power Generating Facility Owner in accordance with this principle." Internal electrical faults are dealt witin in Art 9(3)a.5 by stating "unless the protection scheme for internal electrical faults requires the disconnection of the Power Generating Module from the Network. The protection schemes and settings for internal electrical faults shall be designed not to jeopardize fault-ride-through performance." 4. The necessary parameters are provided in Art 9(3)a.3-4, e.g. short circuit power and pre fault conditions at the connection point. 5. Agree, still this has to take into consideration the main objective of this requirement. See Art 9(5)b.1 on electrical protection schemes and settings: "The protection schemes and settings for internal electrical faults shall be designed not to jeopardize the performance of a Power Generating Module according to this Network Code requirements otherwise." 6. It is acknowledged that the specific implementation of active power recovery after a fault depends largely on technologies and grid conditions. The requirements have been redrafted, leaving full flexibility at national level while respecting the provisions of

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			Art 4(3). For a better understanding of FRT curve interpretation, the ranges by means of a shaded area have been changed to a parameterized curve. The diagram represents the lower limit of a voltage-against-time profile by the voltage at the Connection Point, expressed by the ratio of its actual value and its nominal value in per unit before, during and after a fault. A single FRT curve is required, with several parameters to be set according to the ranges reported in the table (i.e. Uret is the retained voltage at the Connection Point During a fault, tclear is the instant when the fault has been fully cleared. Urec1, Urec2, trec1, trec2 and trec3 specify certain points of voltage recovery after fault clearance).
11	The pulp and paper industry can ride through voltage dips down to 65 % of nominal voltage. Is the voltage less the plant stops. The proposal would require that electricity generation and thus the operation of the process should be possible for dips down to 5 %for type C and down to 0 % of nominal voltage for type D. As the production process trip for voltage disturbances much less than the proposed limits there is no steam for the turbines and the requirements can impossibly be met	partially agree	Specific conditions for disconnection in the case of critical loads and sensitive production processes which have proper justification, are to be set regarding Art 3(6)g or via the derogation procedure.
11.2.a	Reactive Power provision is an ancillary service that must be compensated (e.g. as specified in a relevant Ancillary Services Agreement.)	partially agree	This grid connection code states basic mandatory/optional requirements in order to assure that basic capabilities are available in operational conditions and market procurement in the decades to come. In this respect see also the published paper entitled “NC RfG in view of the future European electricity system and the Third Package network codes”
11.2.a	"...provide Reactive Power at the high-voltage terminals of the step-up transformer to the voltage level of the Connection Point or at the alternator terminals, if no step-up transformer exists" takes the exception as the base case, and the common principle of this code (requirement at the connection point) as the exception.	agree	This requirement has been rewritten that the requirement applies at the Connection Point.
11.2.a	Such a requirement has to be available in advance of the specification stage. The requirements of the relevant network operator should be a published document applicable to all new connections of generating units. Suggest adding "The decision by the Relevant Network Operator will be publicly published and only applicable to generating units that have not yet entered the tendering stage.	partially agree	The NC is applies to new plants. Please refer to the definition of "New Power Generating Module" and Art 3(4) for more details on the transition stage, and plants not yet connected.

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11.2.b	Propose to replace the paragraph with "The Generating Unit shall be able to be operated over the entire voltage range without instability over the entire operating range of the Synchronous Generating Unit". REASON: Not all directly connected generators e.g. asynchronous generators or permanent magnet generators do have an automatic excitation system. Technologies like this especially for Type B generators should not be excluded by the Network Code.	disagree	Asynchronous generators or permanent magnet generators are PPMS and are not covered in this article
11.2.b	Propose to add: "The automatic excitation control system shall be operating in constant voltage control, but the setpoint shall be allowed to be changed"	agree	The principle idea is acknowledged, the notion of a 'selectable Setpoint' is inserted.
11.2.b	"Please define “entire operating range of the Synchronous Generating Unit” It is possible to control either voltage or reactive power. A constant voltage for any value of reactive power is physically impossible."	agree	Wording is considered to be clear.
11.3.a	cogeneration units are based on aero-derivative gas turbines with a low inertia. The “fault ride trough” condition to resist 0 volts during 250msec seems impossible ! Then, the figures 5 & should not permit TSO to impose this too high time-delay. The code may include a figure by generation type	disagree	- For type B/C units a minimum retained voltage of 0.05 p.u. is kept. - 250ms provides the most onerous option within the allowed range. The TSO still has to justify this in the provisions referred to in Art 4(3). This extreme situation does exist in some countries, motivated by political decisions, which cannot be excluded as such in other countries. - In the specification of an FRT requirement at national level still Art 4(1) applies as well.
11.3.a	minimum 0.9 p.u. voltage for long term instead of 0.85pu	partially agree	The range provided in the FRT curve in Table 7.1 of the final NC allows to select 0.9pu as well.
11.3.a	Provide clarification in: are D type units required to follow the fault ride through profile of Figure 5 or Article 13 Figure 7?	agree	FRT Requirements are restructured. Misinterpretation should be avoided now as well.
11.3.a	Replace TSO and say RNO instead in 11.3.a.1	disagree	Due to the strong wide system impact and to ensure a coherent approach the voltage-against-time profile is defined by the TSO. The interaction with other protection settings in which the RNO is involved is prescribed where appropriate.
11.3.a	Any ENTSO-e proposal regarding FRT requirements should give TSOs and DSOs the possibility to take the type of application into account when setting rules for indivual internal combustion engine plants.	disagree	The requirement is set for all generators of a given type in line with the non-discriminatory principle. In case of justified arguments for not being able to comply, the derogation procedure can be followed.

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11.3.a	1) replace in 11.3.a.2 "connection point" with "interface point between the TSOs and the DSOs network" 2)Even with the least onerous curve in Fig 5, the TSO is asking for a performance that will not be achievable on distribution system faults where the main protection is inverse definite minimum time graded.	disagree	- The FRT curve is defined with a minimum retained voltage at the connection point which indicates that it aims at distant faults at the transmission level. - The protection system must be designed while respecting the FRT requirement (see requirements on protection).
11.3.a	Define the FRT requirements in case of asymmetruical faults	partially agree	The FRT requirements have been redefined to deal only with symmetrical faults. As FRT requirements for asymmetrical faults depend strongly on local grid conditions (e.g. neutral point treatment), this is left to the national level.
11.3.a	Inconsistency for a Generating Init connected to a private network as a type C (requirements reference figure 5 > 10%) but as a type D (requirements reference figure 7 > 0%) for the TSO.	agree	Definition of Connection Point has been improved to allow for connection to closed distribution networks (in line with the European Directive) as well.
11.3.a	Please remove the clause (11.3.a.6) and address the requirement by moving the protection related clauses in section 9.6.a, 9.6.b and 9.6.c into section 8.4.	agree	General protection requirements have been shifted to type B requirements.
11.3.a	It is unclear what "appropriate operating voltage ranges" are. Specify more clearly.	agree	Wording has been revised accordingly.
11.3.a	Figure 5: minimum voltage for fault ride through should be set to 0.2. Residual voltage not less than 0.3 p.u. and duration not longer than 0.15	partially agree	The range for retained voltage allows a minimum voltage between 0.05 and 0.3 p.u.
11.3.a	"pre fault minimum short circuit capacity at each connection point" is unclear	disagree	This refers to the minimum short circuit value before occurrence of the fault for which the generator is obliged to fulfil this requirement.
11.3.a	Some essential element to the conducting of simulations are missing in 11.3.a-3 and -4: -The equivalent grid model used to realize the simulations and list of component for the unit and network models to be added by ENTSOE, respectively	disagree	The listed items allow describing a Thevenin equivalent model which is sufficient for this type of simulation.
11.3.a	3.a.5) The Generating Unit shall stay connected to the network and continue stable operation ~~when the actual course~~ **for a specified time period and retained voltage level** of 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, given the pre-fault and post-fault conditions according to points 3) and 4), remains above the lower limit defined in point 2).	disagree	This is follows likely a misinterpretation of the FRT requirement. Please check FAQ 24. The FRT profile defines boundaries, i.e. allowed to trip/not allowed to trip regions. It does not present an exact voltage recovery profile.

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11.3.a	1) Add in Figure 5 some explanation " – Fault ride through profile of a Synchronous Generating Unit. The diagram represents the boundaries for a voltage-against-time profile by the voltage at the Connection Point, expressed at which individual voltage drop and fault time the Synchronous Generating Unit must be stable to the grid. The curve itself is not a voltage dip curve, because the voltage recovery will be in accordance to the time constants of the Synchronous Generating Unit under the conditions given at point 3. 2) To be added: specific appendix shall be added that provide extended explanation with example that clarify requirements of FRT.	partially agree	Explanation should not be provided in the code itself, but it can be accessed in FAQ 24 and other supporting documentation of the final Network Code.
11.3.a	The requirement should not be misunderstood to mean that facilities should stay connected to the network with unchanged power feed-in. This would not be appropriate for Type B facilities.	disagree	The requirement does not state that power feed in must be kept constant.
11.3.a	This article is changed compared to the previous version, now the local TSO can decide but it should be clear that this at this moment not possible. Technically it could be done but than once again it is a CBA issue. The TSO can request this but the Generator should be compensated for the needed investments.	disagree	Comment/proposal not clear.
11.3.a	Add this sentence at the beginning of 11.3.a.4: "At the design stage of the Generating Unit, each Relevant Network Operator shall adopt (...)"	agree	The parameters to be considered for fault ride through capability shall be provided by the Relevant Network Operator on request by the Power Generating Facility Owner.
11.3.a	This requirement only applies to voltage dips that do not result in a loss ol synchronism.	partially agree	Links with other protection settings are provided in the code. The code now states that the PGM "shall be capable of staying connected to the Network and continuing stable operation after the power system has been disturbed by Secured Faults on the Network." which is a crucial aspect of an FRT requirement.
11.3.a	Add in 11.3.a.4 " Voltage at the connection point to be considered as pre-fault condition shall be 1p.u."	disagree	Pre-fault conditions are defined by the TSO while respecting the provisions of Art 4(3)

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11.3.a	1)Each TSO shall adopt **and publish** a decision pursuant to Article 4(3) defining (...) 2)The fault severity must also be defined otherwise the requirement isn't fully defined. 3)A suitable grid equivalent is essential for simulations. It must be representative of real conditions and should therefore also include voltage support provided by other plant in the area e.g. other generating units and reactive compensation plants.	partially agree	1) Every decision adopted pursuant article 4(3) follows the principles of transparency. 2) &3) A simple Thevenin equivalent is considered sufficient for calculations based on which compliance needs to be assured.
11.3.a	redraft completely 11.3.a from 1) to 4)	disagree	No proposal is given and this requirement has been rewritten.
11.3.a	Delete "Undervoltage protection, respecting the appropriate operating voltage ranges, shall be set by the Power Generating Facility Owner to the widest possible technical capability of the Generating Unit and the settings shall be justified by the Power Generating Facility Owner in accordance with this principle."	disagree	This is needed to ensure appropriate coordination between the FRT requirement and local protection needs.
11.3.a	FRT requirements must be evaluated in close contact with DSO in order to secure harmonization of critical network protection gear, tripping devices and opening times. It is important to tune in the requirements given for FRT and the local area protection gear installations and opening times. Special justification on Hydro plants	agree	Requirement is amended by "unless the Relevant Network Operator requires less wide settings according to Article 9(5) (b)."
11.3.b	voltage specification is missing	agree	Wording is revised accordingly.
11.3.b	"The maximum recovery period for internal combustion engines should not be less than 5 seconds." "Due to the low inertia of the internal combustion engines, the active power will oscillate around the target value for a short period right after the fault is cleared. A time of five seconds should assure that these oscillations disappear.	partially agree	Post fault Active Power recovery parameters are to be set at national level while respecting the provisions of Art 4(3). See Art 12(3)a in the final Network Code.

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11.3.b	1) "If there is a breakdown of e.g. a coal mill, the 90%-level after the fault is not possible. It is clear that the generator needs to do its best but if they have a technical problem (nominated/notified) they cannot fulfil the request. 2)This is basically the case for all the requirements, for transparency reasons generators already have to communicate a lot of information about what they can do and what they cannot do. In the General Statements it should be made clear that generators needs to notify temporary dates."	partially agree	1) Post fault Active Power recovery parameters are to be set at national level while respecting the provisions of Art 4(3). See Art 12(3)a in the final Network Code. 2) Covered by Art 8(5)d.1 in the final Network Code.

ARTICLE 12 – REQUIREMENTS FOR TYPE C SYNCHRONOUS GENERATING UNITS

Note: Article 13 in the final Network Code

Issue	**Connection point reference**
Section	Art. 12(3)
Proposal	All requirements must be set at the connection point to the public network. The use of a step-up transformer is not relevant and may not always be in place.
Evaluation	Partially agree
Justification	• The requirement is revised to focus on the Connection Point as the common practice throughout the code. • However, compensation may be asked from the responsible owner of the line or cable between the connection point and the HV side of the step up transformer, as the case may be, while respecting the provisions of Art 4(3). • Note that the definition of Connection Point also includes connections to closed distribution networks.

Issue	**Change of the ranges in U-Q/Pmax profile (envelopes)**
Section	Art. 12(3)
Proposal	Several comments are provided on the representation by use of two envelopes: The envelope will result in extreme generator voltage operation windows and/or extreme on-line tap changer ranges for the step-up transformer. The upper part at the right side and the lower part at the left side are not realistic. Operation in the lower left corner would result in further decrease of a too low grid voltage; operation in the upper right corner would result in further increase of a too high grid voltage! This is not usefull and will only lead to useless costs.
Evaluation	Disagree

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Justification	The envelopes set constraints for the RNO/TSO to specify a U-Q/Pmax profile within. The inner envelop does not represent a U-Q/Pmax capability itself. The proposal is subject to a transparent process according to national provisions as referred to in Article 4(3), including involvement of grid users as the case may be. Wherever this network code allows for a range of values, it will not be possible to set more onerous requirements at national level as this would not be compatible with the principles of this network code (Art. 7). It is acknowledged that many present grid codes set a shape with the lower left and upper right corner being 'cut'. However, due to the wide diversity of different shapes, even within a synchronous area, and anticipating future system planning needs in the decades ahead, there is no guideline what the most appropriate way is of setting more stringent constraints on the envelope approach. See also FAQ … and other supporting documentation to this final network code for more information on this topic.

Issue	**Limit intentionally Reactive power capability limits beyond the voltage range specfied**
Section	Art. 12(3)
Proposal	Delete "in case a Synchronous Generating Unit has a Reactive Power capability beyond the voltage range specified by figure 6, the Reactive Power capability shall not be intentionally limited." This increases the losses in the Generating unit as well as its lifetime.
Evaluation	Agree
Justification	The issue is not about limiting "the capability", but limiting "the provision", if a wider capability beyond the requirements of this code is available. However, such provision and its commercial conditions are out of the scope of this code. The clause has been removed.

Issue	**Tap movements speed**
Section	Art. 12(3)
Proposal	It should be noted that the a tap change of 15 taps in 4 minutes is a very fast time, the voltage should be allowed to stabilize between the change of taps thus it is proposed that the time is changed to 15 minutes. The way of requesting the change should be agreed by the relevant network operator and the owner of the power generation facility.
Evaluation	Agree
Justification	This is rather an operational issue out of the scope of this code. The specification on tap movement speed has been removed.

Issue	**Right to require additional acilities to control the voltage beyond the required capabilities**
Section	Requirements for type C synchronous Generating Units referring to Voltage Stability
Proposal	The Relevant Network Operator is free to ask the Synchronous Power Generating Facility Owner to offer additional facilities installed on the Synchronous Power Generating Facility in order to be able to carry out voltage and Reactive Power control within its area. Technical and financial details as well as the mode of operation can be agreed between the Relevant Network Operator and the Power Generating Facility Owner pursuant to Article 4(3).
Evaluation	Agree

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Justification	Additional facilities beyond the required capabilities are in the responsibility of the Network Operator. The paragraph has been deleted.

Issue	**Admissible Active Power reduction from maximum output with falling Frequency**
Section	Art. 12(2)b
Proposal	Rewrite the requirement as: „For grid stability reasons, being the main objective under such conditions, the generating unit rather should stay connected than bearing the risk of a total trip due to the necessary fast activation of power compensation measures. The generating unit owner provides data to the relevant TSO about the expected output behaviour with frequency and other relevant parameters (e.g. ambient temperature).“
Evaluation	Partially agree
Justification	The relevance of ambient conditions is acknowledged. However, the requirement will be improved in a more general way, which allows for further conditions to be considered for this capability: "Applicability of this reduction is limited to a selection of affected generation technologies and may be subject to further conditions defined by the Relevant TSO while respecting the provisions of Article 4(3)." In addition it is stressed that the crucial parameter for this requirement is the Maximum Capacity, which according to the definition is specified in the Connection Agreement. This also allows to set case specific ambient conditions. In addition the requirement will be moved to Article 8 in the final network code, as it shall apply to all PGMs from Type A on. Note that this shift to type A is rather a relaxation for smaller PGMs than a more stringent requirement.

Issue	**Coordination of speed and power control**
Section	Art. 12(4)
Proposal	The general system management requirement on coordination of speed and power control is to be deleted or to be described in a more general manner.
Evaluation	Agree
Justification	Art 12(4)a.1 has been deleted as it is described a technical solution rather than a capability. Art 12(4)a.2 was a rather odd statement and more or less applies to all the requirements of this network code. As such it has been deleted as well.

12	General Remarks: There are some information in Article 7, 9 and 12 about the relation between, load, frequency, droops and slopes and so one.	disagree	Comment is not clear.

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12.1	In addition to fulfilling the general requirements listed in Articles 7, 8 and 9 as well as the specific typ B Synchronous Generating Units requirements listed in Article 11, except paragraph 2 (a), type C Synchronous Generating Units shall, **unless the electricity production is dependent on external electricity supply,** fulfil the following requirement referring to frequency stability, voltage stability and to general system management through the Network.	partially agree	A specific clause has been inserted taking industrial sites and critical loads into consideration in Art 3(6)h. The comment however also implies the unit cannot always perform a black start; this general type C requirement is not mandatory.
12.2	Proposal to add to the Voltage Stability requirement: "Technological maximum limit of magnetic flux in step up transformer and generator by simultaneous under frequency and overvoltage have to be respected."	partially agree	Acknowledged. However, these limitations are covered by the requirement on electrical protection schemes and settings on which an agreement is needed.
12.2	10% reduction per 1Hz frequency decrease. Argument: Overloading of internal combustion based generating units should be avoided at all times because thermal and mechanical stresses are produced .	partially agree	The specification is set by the TSO while respecting the provisions of Art 4(3). The proposed value is within the range of this network code.
12.2	1)The text of Article 12.2.b should be applicable to all generation that so require for a stable and safe operation and 2) should not be up to TSO discretion.	partially agree	The requirement is shifted to type A PGMs. However, equitable treatment of all users and ensured performance for system security are essential. Hence, a further specification by the TSO in line with Art 4(3) is required.
12.2	Should be a definition of maximum reduction of Active Power output not Maximum Capacity itself. A maximum reduction rate of 2% per Hz is difficult to achieve. The proposed rate is a reduction rate of up to 10% per Hz and is supported by EUTurbines (manufacturers). This clause is a general requirement equally applicable to Types A and B and to non-synchronous generating units - hence it should be moved to Article 7.	partially agree	The requirement is shifted to type A PGMs. The range provided is in line with present requirements in Europe. See supporting documentation for more information.
12.2	1)The acceptance of this reduction should be limited to verifiable affected generation technologies only. 2)Simulations indicate that reduction rate of gas turbines is slightly higher than 2 % per Hz and not dependent on borders like 49 Hz. So the maximum reduction rate shall be at least 2.5 % of maximum capability per 1 Hz dropped. 3) The technical requirements shall define if a generation technology is affected, not the TSO.	partially agree	Implications for specific technologies are acknowledged in the requirement and to be set at national level. Proposed ranges are not in line with present practices or other comments received.
12.2	The explanation of the maximum capacity reduction per Hz is incomprehensible	agree	Wording is revised and a figure is added.

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12.2	1) Below 49 Hz falling up to maximum reduction rate of 20% of maximum capability per 1 Hz frequency drop 2) Acceptance of this reduction is limited to a selection of affected generation technologies agreed between the relevant TSO and the power plant 3) The maximum rate of reduction permissible and the frequency threshold should be harmonized at synchronous area level.	partially agree	1) Maximum of 10% is in line with present practices. Other conditions (e.g. temperature) are to be considered. 2) Acknowledged in the requirement 3) Although frequency related, it depends also on local conditions making it difficult to harmonize e.g. over entire Continental Europe.
12.2	Add at the end of the first sentence beginning with Type C Synchronous…: "…referring to frequency stability except for nuclear power plants that are not allowed to do this by Nuclear Regulatory Authorities.".	disagree	This requirement, as do all others in this network code, aim at new units. Retroactive application has to be justified, will be challenged and has to be approved by the NRA. No argumentation is given to exempt new units. In case of justified arguments, the derogation procedure can be called upon.
12.3.a	Confusion with different names for the same diagram (U-Q/Pmax) --> e.g. PQ diagram	agree	The wording is revised when referring to Reactive Power Capability at Maximum Active Power. However, for Reactive Power Capability below Maximum Active Power, the reference to a P-Q-diagram is correct. The latter diagram is not presented in this code, because it is not a general one, but exists for each type of Alternator individually.
12.3.a	Due to the assignment to the real originator of the costs the additional costs shall be paid by the TSO	disagree	Cost allocations are out of the scope of this code.
12.3.a	The text to figure 6 describes the power factor; the power factor isn't visualized in the figure. Consider deleting the text about the power factor, the text is no informative.	agree	"respectively the Power Factor (cos ϕ)." is deleted in the caption
12.3.a	To add " if required to do so by the Relevant Network Operator., within the of provisions of the relevant Ancillary Services Agreement."	disagree	This grid connection code states basic mandatory/optional requirements in order to assure that basic capabilities are available in operational conditions and market procurement in the decades to come. In this respect see also the published paper entitled "NC RfG in view of the future European electricity system and the Third Package network codes"
12.3.a	To add in 3.a(2): - the U-Q/Pmax profile can be achieved by using all means (e.g. step-up transformers equipped with OLTC) in combination with generator voltage control. JUSTIFICATION:Assuming the red rectangle as the TSO requirement, this would cause very large generators and tap changers which are not available today.	disagree	This code defines functional capabilities. It does not list exhaustively technical solutions how to achieve them, not are specific solutions constrained unless a justified argument exists.

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12.3.a	Delete (a.4): The power generating facility shall be able to deliver reactive power. The obligation to deliver reactive power is not scope of the grid connection agreement. Delivery of reactive power shall be non-discriminative and market based.	agree	Wording has been revised to focus on the technical capability, not the delivery of the service.
12.3.a	12.3.a(3) Last provision pursuant to Article 4(3) must only apply to new Generating Units.	partially agree	This Network Code aims at new PGMs. In case of retroactive application the process referred to in Art 3(2) needs to be followed including justification, challenging and approval by the NRA. There is no need to change this requirement with respect to the comment given.
12.3.a	"reactive power absorbed by the step-up transformer" is more correct than losses	disagree	Losses are present in the transformer. Wording is revised as "Active and Reactive Power losses of the step-up transformer"
12.3.a	Remove Synchronous Generating unit and say PGF	disagree	The definition of "Generating Unit" has been improved as PGM. However, the requirement shall apply to every Power Generating Module within a facility.
12.3.a	The reactive power provision capability requirement applies at the high-voltage terminals of the step -up transformer to the voltage level of the connection point, however this may be limited by generator stability due to Grid short circuit levels at the point of connection	partially agree	The plant must be designed to meet this requirement and not having any stability problem for the minimum short circuit power at the connection point. Note that the requirement has been reformulated to comply with the requirement at the Connection Point.
12.3.a	To be added: theU-Q/Pmax profile shall be agreed between the Relevant TSO and the Power Generating Owner in the case that no step-up transformer is present. Justification: Not considered the case where there is no step-up transformer. Not considered the case other devices (capacitor banks, coils) can be used.	disagree	The requirement determines the functionality, without prejudice over a technical solution to be provided by the Power Generating Facility Operator. Note that the requirement has been reformulated with respect to the link with the step-up transformer.

ARTICLE 13 – REQUIREMENTS FOR TYPE D SYNCHRONOUS GENERATING UNITS

Note: Article 14 in the final Network Code

Note: Requirements on FRT for type D Synchronous Power Generating Modules are now prescribed in Art. 11(3) of the final Network Code. Also some remarks and responses given for type B/C FRT requirements are still valid for type D

Issue	**Voltage stability requirements for type D Synchronous PGMs**
Section	Art. 13(2)
Proposal received	Various comments were given on the extensive level of detail of requirements on voltage

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	control, excitation system and power oscillation damping control, as being too detailed on technical machine specifications instead of focusing in capabilities at the connection point.
Evaluation	Agree

Justification	The paragraph has been strongly shortened, addressing the relevant capabilities and objectives to be set in agreement between the PGF owner and the RNO in coordination with the Relevant TSO, while respecting the provisions of Art 4(3):
	• specifications and performance of an Automatic Voltage Regulator (AVR);
	• specifications and performance of the Excitation System with regards to
	  ○ bandwidth limitation of the output signal;
	  ○ Underexcitation Limiter;
	  ○ Overexcitation Limiter;
	  ○ stator Current limiter; and
	  ○ PSS function as of a to be defined Maximum Capacity threshold.

13.3	To add "unless the protection scheme of the Power Generating Facility requires the disconnection of a Generating Unit from the network."	partially agree	The coordination between FRT requirements and protection for internal electrical faults, as well as the global electrical protection scheme (all in the design phase) has been clarified throughout the code.
13.3	The fault severity must be defined so that simulations can be performed. The grid equivalent should be representative of real conditions and should therefore also include voltage support provided by other plant in the area e.g. other generating units and reactive compensation plant.	disagree	The listed items allow describing a simple Thevenin equivalent which is considered sufficient for calculations based on which compliance needs to be assured.
13.3	The intention of 3) and 4) is unclear Are items 3) and 4) intended to be decisions case by case acc. to unit and connection point, or are these boundaries for defining specific requirements to be applied in the control area of TSO or DSO ?	partially agree	Wording is improved. These decisions will not be on a case by case basis, but a general requirement set by the TSO due to the strong impact on system security, while respecting the provisions of Art 4(3). Interaction with RNO protection schemes is described as well in the code.
13.3	The maximum recovery period of the ENTSO-e proposal is not viable for internal combustion engine based generators units (and other technologies) of Type D. The proposed area for Fault Ride Through Capacity is too large for technical reasons linked to the inertia of the generating unit.	disagree	The 250ms provides the most onerous option within the allowed range, with most present grid codes having a shorter fault clearance time. The TSO still has to justify its proposal in the provisions referred to in Art 4(3). This extreme situation does exist in some countries, motivated by political decisions, which cannot be excluded as such in other countries. Art 4(1) still applies in such a decision: "The requirements established in this Network Code and their applications are based on the principle of non-discrimination and transparency as well as the principle of optimisation between the highest overall efficiency and lowest total cost for all involved parties."

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13.3	The settings shall only be justified by the Power Generating Facility Owner if they do not meet the mandatory requirements.	agree	Wording is revised. "… The settings shall be justified by the Power Generating Facility Owner in accordance with this principle."
13.3	The short circuit duration required in the Fault Ride Through profile in figure 7 should be consistent with the actual protection performances which usually lead to fault clearance times less than 150ms. In the Great Britain Grid Code, the Fault Ride Through profile shows a short circuit duration of 140ms. The maximum short circuit duration required also has to be consistent with the Critical Clearance time of the Generating Unit. Generators should not be required to operate indefinitely under conditions which are outside system steady-state operational limits. Figure 7 must therefore be adapted in accordance with the minimum requirements for state of the art grid protection and conditions shall be in accordance with system steady-state operational limits. To prevent discrimination, each TSO shall publish all such Network related parameters. Further clarification is needed because figure 7 is not consistent with figure 5. Hence, for a generator that is, for example, a Type C and a Type D, do both clauses apply, or if not, which one?	disagree	The 250ms provides the most onerous option within the allowed range, with most present grid codes having a shorter fault clearance time. The TSO still has to justify its proposal in the provisions referred to in Art 4(3). This extreme situation does exist in some countries, motivated by political decisions, which cannot be excluded as such in other countries. Art 4(1) still applies in such a decision: "The requirements established in this Network Code and their applications are based on the principle of non-discrimination and transparency as well as the principle of optimisation between the highest overall efficiency and lowest total cost for all involved parties." In case a PGM cannot meet the national implementation of a requirement due to justified arguments, the derogation process can be invoked. The request to publish 'all such Network related parameters' is extremely onerous and in conflict with confidentiality agreements with other grid users. The comment on a generator being type C and type D at the same time is not understood.
13.3	There are some questions about the fault ride through curve A). How is the interpretation of this curve? Are the points on the red lines to be considered as initiating points (e.g. voltage dip duration and residual voltage value), i.e. the plant has to remain stable for each point on a defined curve in the shaded area? Or Has the response curve of the plant to remain in the area between the red lines (the simulated response of plant does not follow a curve as indicated in the drawing)? B). The boundary conditions for compliance with the curves (which short-circuit power in the grid, which operating point / power factor)?	partially agree	Please check FAQ 24 for clarification on the interpretation of the FRT requirement.

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13.3	3) Each […]~~TSO~~ Relevant Network Operator shall adopt a decision pursuant to Article 4(3) defining the pre-fault and post- fault conditions for the fault ride through capability in terms of:	agree	Wording revised accordingly
13.3	6)This is a repeat of Art 11 3a(6). It is superfluous and thus should be removed.	agree	Structure of the four FRT requirements has been revised.
13.3	Type D Synchronous Generating Units with their Connection Point above 170kV shall fulfil the following requirements referring to robustness of Generating Units. This proposal complements the proposal to have a generator categorisation without voltage threshold. As the Framework Guidelines describes clearly to focus on cross border effects, this FRT requirement shall only be restricting for PGF's with a Connection Point above 170kV.	disagree	Wide spread loss of embedded generation in the case of a Secured Fault poses a serious system risk. For this reason this code prescribes FRT requirements as of type B PGMs. See FAQ and supporting documentation for further analysis of the topic.
13.3	Technical capabilities in order to aid angular stability under fault conditions shall be agreed between the responsible TSO and the Power Generating Facility Owner. Unless national law gives the Relevant TSO authority to make such decisions pursuant to Article 4(3), technical specifications shall be agreed between the TSO and the Power Generating Facility Owner. The costs shall be borne in accordance with Article 4.2. To prevent discrimination, to optimize technical solutions and to minimize costs, the Responsible TSO is free to install extra equipment in the Network or to ask the Power Generating Unit Owner to install extra equipment in the PGF. If extra equipment should be installed in the PGF it shall be agreed between the PGF owner and the relevant Network Operator. In the agreement technical specifications as well as the costs will be addressed.	partially agree	The requirement is based on an agreement: "...if allowed or requested by the Relevant TSO. While respecting the provisions of Article 4 (3), the specifications shall be agreed between the TSO and the Power Generating Facility Owner." Cost allocations can be agreed on in the contract, but prescriptions on this are out of the scope of this network code.
13.3	Delete 6) :Widest possible technical capability is not defined in the code. Please consider that all requirements of Health and safety as well as environmental aspects shall be fulfilled without any impact to the life time of the power plant devices.	disagree	The plant must be <u>designed</u> to comply with the full technical requirements of this network code, and must meet these requirements whilst ensuring compliance with other laws, regulations, etc i.e. within the area of health and safety, and/or environmental.
13.1	Article 11 subparagraph 3 shall be excluded because for type D units the fault ride through capability is ruled in Article 13 subparagraph 3.	agree	Note however that the requirements on FRT have been restructured.

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13	Not valid for generators in process industry	partially agree	Critical loads with sensitive production processes are addressed in Art. 3(g)h. Alternatively the derogation procedure can be called upon on a case-by-case basis or for a class of units when valid arguments are available.
13.3.a	An example should be included to show how the fault ride through requirement is to be interpreted	disagree	Examples are provided in the FAQ and other supporting documentation. As the network code is the blueprint of a European Regulation, examples cannot be provided in the code itself.
13.3.a	If approved by the Network Operator, the voltage-against-time-profile can be applied to the first meshed node in the transmission system instead of the Connection Point.	disagree	The interface with the public/private network is the relevant point to set this requirement, especially for type D PGMs. For type B/C PGMs the minimum retained voltage took into account that faults at transmission level, not at the Connection Point, are envisaged. Due to the severe potential impact of tripping of a type D PGM, no retained voltage is allowed during the fault clearance time.
13.3.a	…delimited by the red lines in figure 5. Only in case exceptional circumstances apply. Such exceptional circumstances have to be defined by the Relevant TSO, in compliance with the…	disagree	The FRT requirement is a non-exhaustive requirement, in which the provisions of Art 4(3) are to be followed when defining its national implementation. As such, no specification on exceptional circumstances is justified here.
13.3.a	Technical capabilities in order to aid angular stability under fault conditions (e. g. fast valving or braking resistor) is allowed to be implemented if necessary to fulfil the requirement of fault ride through as requested by this code under Article 12. Specifications shall be made available to the TSO by the Power Generating Facility Owner and demonstrated as per Article 46.3	disagree	These devices have a severe influence on the overall system security. Therefore the TSOs shall request or allow the installation. Specifications have to be agreed bilaterally while respecting the provisions of Art 4(3)
13.3.a	Modify 13.3.a.7). "..shall be implemented if allowed or requested by the responsible TSO. If the TSO requested the implementation, emerged costs from the implementation are to be borne by the TSO. "	disagree	Cost allocations are out of the scope of this code.
13.3.a	Instead of each TSO defining the voltage-against-time-profile, an alternative method could be to define a site-specific event at which the power generating facility shall stay connected to the grid and continue stable operation. …	disagree	The NC method defines more clearly the capabilities needed from a power plant as it is not so related with a specific connection point. As networks change, so do events and hence a more generic level of capability is more appropriate to ensure future use of the capability.
13.3.a	Modify 13.3.a.7). "...fault conditions (e. g. fast valving or braking resistor) ~~shall~~ **can** be implemented if allowed	disagree	TSOs must have the right to request these devices to ensure adequate response to maintain security of supply.

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13.3.a	Remove 13.3.a.6): "Undervoltage protection….."	disagree	The undervoltage requirement is different that the FRT requirement. The plant must not set an undervoltage relay setting more conservative than is necessary as this can artificially limit the capabilities of the generator and un-necessarily jeopardize the system security. The clause has been revised to address this more clearly.
13.3.a	Modify 13.3.a.6). It is unclear what appropriate operating voltage ranges are. Specify more clearly.	agree	Wording is revised accordingly.
13.3.a	Modify Figure 7: "long term voltage should not less than 0.9 p.u."	disagree	This curve defines an FRT capability. The longer terms operating voltage ranges are defined in tables 5.1/5.2 or pursuant to national law if the voltage is lower than 110 kV. Both requirements are aligned.
13.3.a	Modify 13.3.a.3): 1.- Each TSO shall adopt and **publish** a decision pursuant to Article 4(3)	agree	"Each TSO shall define and make publicly available while respecting the provisions of Article 4(3) defining the pre-fault and post-fault conditions for the fault-ride-through capability in terms of …" "Each Relevant Network Operator shall provide on request by the Power Generating Facility Owner the pre-fault and post-fault conditions ..."
13.3.a	Modify figure 7 using exponential curves	disagree	The curves proposed in the comment are only for a fault in the connection point, while the requirement is intended to cope with different types of faults in the Network(not only a fault in the plant connection point). In addition, the requirement is non-exhaustive, allowing a TSO to specify any type of voltage against time curve within the prescribed ranges while respecting the provisions of Art 4(3).
13.3.a	Modify 13.3.a.7). "..shall be implemented if **necessary for grid security** ~~allowed or requested by the responsible TSO~~."	partially agree	Based on this assessment the TSO is the responsible party to take this decision.
13.3.a	Modify 13.3.a.5): ".. shall stay connected to the network and continue stable operation **for a specified time period and retained voltage level.**~~when the actual course~~ of one of the three phase-to-phase voltages.."	disagree	The original description is correct.

ARTICLE 14 – REQUIREMENTS FOR TYPE A POWER PARK MODULES

Note: This Article does no longer exist in the final Network Code.

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Issue	**Reactive Power control requirements for Type A units**
Section	Article 14.1
Proposal received	No reactive power control requirements for Type A units should be asked for. Specifications should be settled in European standards.
Evaluation	Agree
Justification	The requirement has been deleted from this Network Code as it is not considered a cross-border issue given the deeply embedded connection in the power system.

ARTICLE 15 – REQUIREMENTS FOR TYPE B POWER PARK MODULES

Note: The requirements on FRT have been restructured. In the final Network Code the FRT requirement for type B PGMs is prescribed in Art. 9(3). Comments given on this requirement are in line with the ones given on FRT requirements for type B Synchronous Power Generating Modules. Neither those comments, nor their responses are repeated here.

Issue	**FRT and reactive current injection during faults requirements for type B PPMs**
Section	Article 15
Proposal received	Comments receive cover the following basic points: Overall we would consider that the combined requirements for FRT and for reactive current injection are extremely onerous and are likely to be beyond the capabilities of some PPM technology at Type 'B' power levels. For example, it is anticipated that the majority of small Wind Turbines associated with the Type B rating (which on a 'Power Park Module' basis is as low as 100 KW) would not be able to meet a combined requirement of FRT with reactive current injection, or possibly either of the requirements, independently, currently. Where is the quantifiable justification for such requirements? Such requirements should either be moved to Type 'C' for PPM or, preferably the threshold levels should be set much higher with the ability to lower them, pursuant to article 4 (3), to future proof and allow for regional requirements. There is no coherence in the specification with respect to what is required at the Connection Point and what is required at the terminals of the Units. - The FRT profiles are prone to wrong interpretation - specification lacks clarity in several places, - in some places not corresponding to state-of-the art in other places is in some respect much more demanding than present codes, without proper justification - for fast current injection it specifies implementation methods rather than required behavior. In this way the required implementation lies close to many existing patents and prevents free trade in Europe. - The changes required are so fundamental that they cannot be achieved by some editing in the text here and there.
Evaluation	Partly agreed
Justification	Article 15(2) on fast acting additional reactive Current injection at the Connection Point to the

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	pre-fault reactive Current injection in case of symmetrical (3-phase) faults, has been revised by the following:
	• More focus is put on the functional capability, giving less stringent technical details;
	  ○ the option to implement the capability at the connection point or at the terminals of the individual units is left to the design of the PGM.
	  ○ To focus on the envisaged behaviour a first 'crude' stage is introduced in which at least 2/3 of the current is required in a time period to be set but not less than 10ms. The full current should be reached within 60ms within an accuracy of 10%.
	  ○ A safeguard for the total reactive current not to surpass the short term dynamic current rating (which covers up to 400ms in line with an FRT profile at retained voltage above 0V) is included.
	• Making the requirement optional for the RNO in coordination with the Relevant TSO to take a decision on. It is acknowledged that it depends on regional system conditions whether the requirement is relevant or not. If so, it has a major benefit to support the system during Secured Faults and improve system stability.

Issue	**FRT 400ms fault clearance time**
Section	Art 15 3 b
Proposal	Frequency detection during 400ms without voltage is not possible for inverter based Power Park module. Sudden phase shift after fault will occur.
Evaluation	Agree
Justification	The maximum fault clearance time for type B/C PPM FRT requirements is aligned with the other FRT requirements to 250ms which covers all FRT practices throughout Europe.

Issue	**Post fault active power recovery time**
Section	Art 15 3 b
Proposal	Delete the requirement / change the paragraph so that the maximum recovery time shoulbe be between 2 (5)...10 sec and the level should be 90%
Evaluation	Partly agreed
Justification	It is acknowledged that the specific implementation of active power recovery after a fault depends largely on technologies and grid conditions. The requirements has been redrafted, leaving full flexibility at national level while respecting the provisions of Art 4(3). Note, this is in line with other occurrences of the FRT requirement in this code.

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ARTICLE 16 – REQUIREMENTS FOR TYPE C POWER PARK MODULES

Issue	**Synthetic Inertia**
Section	Art. 16(2)
Proposal	Several comments received requested to delete this requirement: • Inertia deviates from existing requirements; it should be justified by a CBA. It will need to desoptimize the PPM which is very costly • Moreover, it is already included in the LFSM-O requirement. • Eventually the unit that have inherent inertia shall not be excluded.
Evaluation	Partially agree
Justification	• Inertia is a non-mandatory requirement that can in many cases be achieved without desoptimizing the power plant. For some of the PPMs a small storage device might be needed, in this case the CBA might be negative. For wind turbines, some technical solutions have already been proposed. In case requested, justification will be provided in the provisions referred to in Art. 4(3). • The aim of inertia and LFSM-O are not the same, and effects on the grid are different. The inertia is time limited and aims at decreasing the rate of change of frequency, while LFSM is activated as of a predefined frequency threshold and aims at limiting the extreme frequency value after an event. • The definition of inertia has been improved to take into account this remark. With the new definition, for example a wind turbine with full converter, which has inertia with its rotating part, is not considered has having inherent inertia. Now the inertia only refers to the technologies where the rotor speed and the system frequency are coupled.

Issue	**Reactive Power capability**
Section	Art. 16(3)
Proposal	Please justify or reduce the U/Q and P/Q diagram: • The reactive power range is too wide • It is not possible to achieve full reactive range for an active power output close to 0. • Please take into account that for many type C units there is no step up transformer and then the full U/Q diagram is unachievable. • All requirements should be defined using the Connection Point.
Evaluation	Partially agree
Justification	The shapes of the U/Q and P/Q diagrams have not been changed. For the U-Q/Pmax capability the text has been revised to clarify that the profile needs to be within the boundaries of the inner

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	envelope. As such it must be emphasized that the Reactive Power capability requirement in this network code does not require all PPMs to be able to operate in the lower left and upper right corner of the given envelope. The code is amended by stating that the U-Q/Pmax curve does not need to be rectangular, while respecting the following: "For profile shapes other than rectangular, the voltage range represents the highest and lowest values. The full Reactive Power range is therefore not expected to be available across the range of steady state voltages." Diversity in present grid codes and the need to be able to cope with future system conditions do not allow cutting the corners in a manner that will not restrict possible future needs. In any case, the capability will be defined at national level while respecting the provisions of Art 4(3), and where a proper justification for the final choice may be addressed. All reactive power requirements have been shifted to the connection point. It eases the understanding of the requirement and takes into account that for some type C connections there may be no step-up transformer. The width of the maximum envelope has not been changed as it is in line with existing requirement in some European countries. Reactive Power capability below Maximum Capacity has been relaxed by no longer requiring full reactive power at zero active power output. Instead the requirement states "the P-Q/Pmax-profile can be of any shape and shall include conditions for Reactive Power capability at zero Active Power;" This strikes a proper balance between techno-economic implications for some wind turbine technologies while still providing a needed basic capability for system operation.

Issue	**Time response for voltage control**
Section	Art 16(2)e
Proposal	90% of reactive response in 1 sec is too fast (and may cause instability). This requirement is specific for GB but is not appropriate for CE.
Evaluation	Agree
Justification	Having a fast response for reactive power will not cause any instability; it is already the case in GB for generating units, and in other countries for voltage management device (such as SVC / Statcom units). The requirement for time response of reactive power has been changed to allow for slower response. The requirement now uses two reference times, rise time and settling time which will be defined by the RNO while respecting the provisions of Art 4(3). The rise time shall be chosen between 1 and 5 sec and the settling time shall be between 5 and 60 sec.

16.1	Re-synchronisation of PPMs is not possible as requested by Article 9(4) d.	agree	Article 9(4)d regarding re-synchronization after tripping onto auxiliary supply by a circuit breaker on the voltage level of the Connection Point, has been removed.

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16.1	We welcome the requirements regarding the Fault ride through profile for Wind Parks in the document for Type C. This requirement will ensure robustness and stability in our electrical network, since the amount of installed Power will double the maximal demand in our region by 2014.	agree	The positive comment is appreciated.
16.2.a	Delete paragraph about inertia 'as tackling by local TSO is needed anyway'	disagree	No clear argumentation is given.
16.2.a	Synthetic Inertia - cooperation with the Relevant DSO is needed as well as there needs to be sufficient line capacity for the additional power to be transported.	disagree	The additional power that would be delivered during the action of synthetic inertia would be only during a very short time period, which is considered not to affect the transport capability of lines.
16.2.a	Limit synthetic inertia to low frequency events. For high frequency events the machine redesign would be too costly.	agree	The requirement aims at managing loss of generation. For high frequency events other measures are such as LFSM-O are more beneficial.
16.2.a	Focus on performance of inertia rather than on implementation.	partially agree	The requirement only mentions 'The operating principle of this control system and the associated performance parameters' to be defined by the Relevant TSOs. No technological implementation options, such as storage devices, are referred too.
16.3.b	Power factor is no longer used in the figure, please remove it.	agree	Wording is revised accordingly.
16.3.b	Table 7 is in contradiction with EN 50160	disagree	EN 50160 deals with quality of supply. It does not limit the voltage range for reactive power capability.
16.3.b	Values in the table and figure for Continental Europe are not aligned.	disagree	Values (continental Europe) in the table and the figure are consistent, both providing a range of 0.75 in Q/Pmax.
16.3.b	Inconsistency of point where the requirements applies.	agree	Wording has been corrected and made consistent. The requirement applies at the Connection Point.
16.3.b	Voltage ranges for Baltic should be aligned to Nordic.	disagree	No proper argumentation is provided.
16.3.b	Voltage ranges are not in line with reactive current provision requirement in Article 15. So the values in Table 7 need to be changed.	disagree	The requirement for reactive current provision has been rephrased to be consistent.
16.3.b	Voltage ranges are wider than in Article 10.	disagree	Article 16(3) covers reactive power capabilities and voltage control. It states a capability to deliver reactive power over a defined voltage range. Article 10 covers operational voltage ranges and the time period within which the PGM needs to be capable to remain connected. There is no reason for which the ranges need to be identical.

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16.3.c	Remove the requirement on tap changer operation.	agree	The clause on speed of tap changes is considered to be an operational aspect, not of relevance in this connection requirement.
16.3.c	Define technically available	agree	Clarification is given by adding '(i. e. not out-of-service due to maintenance or failure).'
16.3.c	The PPM will never be able to operate at any point in the outer envelope	agree	Wording of the requirement on 'Reactive Power capability below Maximum Capacity' has been reworded strongly to avoid misinterpretations and provide a relaxation for reactive power near zero active power output.
16.3.d	There should be a graphic showing how technically the active current injection during the fault should look like.	disagree	The aim of this requirement is to ensure that the PPM will deliver as much active power as technically feasible. There is no illustration as more details are to be defined at national level, e.g. taking technology dependencies into account.
16.3.d	Inconsistency of active current provision with FRT requirements. Active Power Contribution to start after fault clearance.	disagree	The requirements are independent from the FRT requirement. If FRT conditions are not fulfilled the Power Park Module may still disconnect from the network. This requirement is to be seen regardless to the fault duration, as long as the voltage remains above the FRT profile.
16.3.d	Maximum apparent current to be considered.	disagree	Apparent current limitation is covered by requirements on electrical protection coordination.
16.3.d	Requirement to be removed, because it is not in the scope of reactive power capability.	disagree	The requirement indeed is not related to reactive power capability, but it belongs to the requirements relevant to voltage stability, which is the title of Art/. 16(3). However, to improve readability, paragraphs d) and e) are switched.
16.3.e	Reactive power control mode have no link with cross border issues	disagree	Reactive power management is relevant for voltage stability, which is a cross-border issue.
16.3.e	What is a combination of 2 control mode for reactive power. Change to switching between mode or detail this requirement	agree	'by a combination of two of these' is deleted.
16.3.e	Why is it not sufficient to specify simply +/- 5%? To specify an absolute value of 5 MVAR for large PPM would appear wholly unnecessary.	disagree	For a large PPM (e.g. type D), 5% may be too large a step for reactive power; it could cause voltage perturbations on the grid that would affect other users.
16.3.e	Specify the tolerance for Power Factor Control Mode	disagree	The requirement states this will be specified at national level while respecting the provisions of Art 4(3). No argumentation is given why this is to be specified at European level.
16.3.e	Voltage is not an input for Power Factor control, remove "Step change in voltage " from the requirement	agree	Wording is revised accordingly.
16.3.e	Power Factor accuracy is infinite at low active power.	agree	Wording is amended by stating 'or % on the Reactive Power value issued from conversion of Power Factor value'

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16.3.e	Inconsistency in references.	agree	References are updated.
16.3.e	Please provide a CBA for reactive power control mode	disagree	This is a non-exhaustive requirement with relevant specifications to be set at national level while respecting the provisions of Art 4(3).
16.3.e	Reference for steady-state reactive power tolerance to be introduced. (to what 5% of tolerance is related to)	agree	Wording is amended by '5 % of the maximum Reactive Power.'
16.3.e	The size of the step necessary to execute the full reactive power provision should be identified and should, reasonably, be larger than the applied value of droop.	partially agree	The size of the step for delivering full reactive power provision shall be of course larger than the droop. But the requirement says that 90% of the expected reactive power change shall be provided in a time… . If the step change is small, the expected reactive change is small too. Therefore the size of the step does not need to be specified in the code.
16.3.e	The power factor control mode should be defined by Relevant Network Operator, not only relevant DSO	agree	Wording is revised accordingly.
16.3.e	limit Setpoint for Voltage control to cover 0.95 - 1.05 pu (remove 'at least')	partially agree	Semantically the comment is correct, but stating 'at least' makes clear it is a minimum requirement.
16.3.e	limit deadband for Voltage control to less than +-10% (5% proposed)	agree	The deadband shall not be wider than the minimum voltage range. The requirement is improved accordingly.
16.3.e	zero deadband in voltage control causes risk of system instability, minimum deadband shall be larger than zero	disagree	The option of zero deadband is maintained. If indeed a risk of system instability occurs, a value larger than zero can be selected.
16.3.e	Editorial change : describe a capability not a statement : " the PPM shall be "	agree	'shall be achieved' is replaced by 'shall be capable of achieving'
16.3.f	Damping of power oscillations deviates from existing requirements. Proposal to delete the requirement.	disagree	The requirement is non-mandatory. The phrasing 'if required by the Relevant TSO, while respecting the provisions of Article 4(3)…' implies that a justification needs to be provided at national level if called upon.
16.3.f	Clarification on method of power oscillations damping.	partially agree	Wording is revised. 'as prescribed' is removed and replaced by 'The voltage and reactive power control characteristics of Power Park Modules shall not adversely affect the damping of power oscillations.' No specification is given in this network code on how to implement power oscillation damping.
16.3.f	Decision by Relevant Network Operator rather than by Relevant TSO	disagree	Power oscillations control is of relevance for transmission system security. Note again that the requirement is not mandatory for all type D PGMs.

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ARTICLE 17 – REQUIREMENTS FOR TYPE D POWER PARK MODULES

Note: The requirements on FRT have been restructured. In the final Network Code the FRT requirement for type D PGMs is prescribed in Art. 11(3). Comments given on this requirement are in line with the ones given on FRT requirements for type D Synchronous Power Generating Modules.

Issue	**Reactive Power Capability at Maximum Capacity**
Section	Article 17
Proposal	Add a new paragraph with „Reactive Power Capability at Maximum Capacity
Evaluation	Disagree
Justification	Since Article 16 (3) b applies also for Type D PPM, there is no need to add a paragraph for Type PPM including Reactive Power capability at Maximum Capacity

Issue	**Applicability of FRT capability at nearest point of transmission system**
Section	Artcile 17(1)a.2
Proposal	The FRT profile should apply at the nearest point of the transmision system, if the PPM is not connected to the Transmission System
Evaluation	Disagree
Justification	It is not practical to provide user specific requirements for FRT based on the case-specific transmission fault level. This would be too variable, non-transparent and potentially discriminatory. In addition the size / voltage level connection of type D units most often result in severe direct system impact in case of tripping during a Secured Fault. In case justified arguments exist for a case specific FRT setting, the derogation procedure can be called upon.

Issue	**Requirements only for type D PPM connected above 170 kV**
Section	Article 17(1)
Proposal	Since the Framework Guidelines describes clearly to focus on cross border effects, the FRT Requirements shall only be restricting for PGF's with a Connection Point above 170kV.
Evaluation	Disagree
Justification	As clarified in FAQ 7, Type A, B, C and D PPM are considered as Significant Grid Users, hence they have influence on Cross Border issue. Moreover since the FRT capability is related to Frequency issues in which mass tripping in case of a Secured Fault can have a detrimental impact, the FRT capability is a requirement which should apply for Type B, C and D Power Park Modules. See also FAQ 24 and other supporting documentation to this final Network Code for more information.

Issue	**FRT profile interpretation – Voltage Steady State**
Section	Article 17.1.a.5 – Figure 12
Proposal	Generators should not be required to operate indefinitely under conditions which are outside system steady-state operational limits, therefore the Fault Ride Through profile should be

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	updated according to the actual system steady-state minimum operational limit.
Evaluation	Disagree
Justification	The FRT parameter ranges are consistent with the operating voltage ranges defined in Tables 5.1/5.2 for voltage range capabilities for all type D PGMs. There is no need to adapt the parameters.

Issue	**Different FRT profile for Type D PPM**
Section	Article 17.1
Proposal	The requirements specified in Type D, especially in reference to Fault-Ride-Through requirements for Wind Parks connected to 110kV or above are too restricted. Power Parks shall comply only with requirements indicated in Type B or Type C. Type D requirements shall apply only for synchronous generation, since for type D PPM, the FRT capability considers a voltage situation at the connection point that is very unlikely to occur in a wind turbine, where typically the power system module is located on the low voltage side..
Evaluation	Disagree
Justification	As stated in Article 17(1)a.1, the FRT profiles applies at the Connecion Point, not at an internal network point, nor at the turbine terminals. Short circuits close to the Connection Point can lead to a loss of PPM production which may result in a loss of a huge power even if the the short circuit is cleared correctly, if a different Voltage-against time profile is proposed.

ARTICLE 18 – REQUIREMENTS FOR OFFSHORE POWER PARK MODULES – GENERAL PROVISIONS

Issue	**Requirements for Offshore PPM - to be removed from this code**
Section	Art. 18 - 23
Proposal received	Comments are made to cancel these articles or re-draft completely. All aspects mentioned in relation to offshore need a much more in depth and thorough analysis - partly to avoid mis-scoping and partly to be sure not to risk to make offshore more expensive than absolutely needed.
Evaluation	Partially agree
Justification	The Requirements for AC connected Offshore PPM are appropriate and justified in order to ensure the system security. Present approved technology standards are the basis for these requirements. The requirements for AC connected Offshore PPM consider an open, robust and cost-efficient planning for offshore connections. A possible operation under different conditions is considered and a reasonable and grid compliant technical behavior of the Offshore PPM at normal and disturbed conditions is required. Heavy physical conditions at offshore sites have to be considered in the design for the offshore components by manufacturers. ENTSO-E agrees to re-assess the requirements for DC connections for Offshore generation in line with an upcoming HVDC connection Network Code. Given the urgent need for clear DC connection rules for offshore generation, the timeline for the HVDC code has been moved forward in the three year work program. As such connection requirements for offshore DC generation are taken out of this NC RfG. Due to this revision only requirements for Configuration 1 (AC connection to single onshore point) and Configuration 2 (Meshed AC connection) are retained in the final Network Code.

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Issue	Definition of Offshore Power Park Module / Glossary
Section	Article 18
Proposal received	The use of the term "Power Park Module" is misleading. A Power Park Module consists of generators that are not synchronously connected to the system. Use the term "Offshore Power Generation Facility" instead.
Evaluation	Partly agree
Justification	A definition of an Offshore Power Park Module is introduced in the Glossary: “Offshore PPM is a Power Module located offshore with an Offshore Connection Point.”

18.1	Should an offshore connection point be a defined term? How does such a point relate to obligations laid out elsewhere in this RfG Code? Do the requirements apply at the offshore connection point or onshore connection point?	disagree	A clear definition of Connection Point is needed, due to the different Laws within Europe. For Offshore PPM with onshore Connection Point the requirements for Onshore PPM will apply. For Offshore PPM with Offshore Connection Point the requirements for Offshore PPM will apply. The RNO will define the Connection Point while respecting the provisions of Art 4(3).
18.1	In some systems the transmission owner rather than the Transmission Operator may define the offshore grid entry point ownership boundary. There are circumstances where the Transmission Owner and Operator may be different parties and this should be recognised.	partially agree	This is covered by the reference of 'while respecting the provisions of Art 4(3)'. Art 4(3) states 'The establishment of these terms and conditions or their methodologies shall be performed by entities and based on the legal framework indicated in this Network Code where reference is made to this paragraph, unless national legal framework provides otherwise at the day of the entry into force of this Network Code'
18.1	If a PGF Owner makes a commercial decision to build an offshore platform which includes a synchronous generator, what will be the classification of this plant, as currently the Network Code does not appear to allow for such an eventality?	partially agree	This potential case is covered by Art 3(6)e which states 'For offshore connected Synchronous Power Generating Modules the requirements for onshore synchronous Power Generating Modules shall apply unless modified by the Relevant Network Operator while respecting the provisions of Article 4(3).'
18.1	Illustration of Categorization of Connection of Offshore PPM	partially agree	Illustrations for clarification are not part of a network code. This could be taken up in supporting documents, like for example done for schemes of PGM, PGF. However, due to the shift of four of the six categories to the forthcoming HVDC connection code, the need for illustrations is likely changed.

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ARTICLE 19 – FREQUENCY STABILITY REQUIREMENTS APPLICABLE TO OFFSHORE POWER PARK MODULES

Issue	**Interface for Active Power reduction**
Section	Art. 19
Proposal received	• The frequency stability requirements defined respectively in Article 9(2) (a), (b), (e) and (g) shall apply to any Offshore Power Park Module, irrespective of its configuration. • If there are operational issues requiring frequency related actions, then these should be dealt with through the conventional methods of balancing, such as automatic frequency control related actions and/or instructions to deload or trip as applicable. • It is not acceptable for a TSO to specify such "deload facilities" (through conditions applied to Type 'B' units – Article 8(2)) and this reference should be deleted.
Evaluation	Disagree
Justification	• An interface for active power reduction at the Offshore PPM is needed as a countermeasure for fast active power reduction in order to ensure system security at temporarily extreme system disturbances in the network. Paragraph 8(2) is redrafted. • In order to be able to control Active Power output, the Power Generating Module shall be equipped with an interface (input port) in order to be able to reduce Active Power output as instructed by the Relevant Network Operator. The Relevant Network Operator shall have the right to adopt a decision while respecting the provisions of Article 4(3) determining the requirements for further equipment to make this facility operable remotely.

Issue	**Delivery Point for Active Power for participation in FSM, LFSM-O, LFSM-U**
Section	Article 19
Proposal received	The frequency stability requirements as defined in Article 7(1) (c) or Article 9(2) (c), and Article 9(2) (d) and Article 16(2) (a) shall apply to any Offshore Power Park Modules, at the Offshore Connection Point, irrespective of its configuration. Where will active power delivery be defined against? We believe it should be the Offshore Connection Point.
Evaluation	Agree
Justification	The offshore connection point always shall be used for active power response according to FSM, LFSM-O and LFSM-U.

19.1	When referring to Article 7(1)(C)(3), not relevant for wind power. Speed control is not used.	agree	Wording is revised under the Frequency Control requirement to cover this issue.
19.1	When referring to Article 7(1)(C)(2), define system frequency. Is it the transmission system frequency or the local frequency close to the wind turbines?	disagree	The measurement point for frequency in order to fulfil FSM, LFSM-O and LFSM-U is always the Offshore Connection Point.
19.1	Setpoint for Automatic Generation from Load-Frequency Controller - the term 'automatic generation' needs to be defined in Art. 9(2)g.2	agree	Subparagraph is deleted in Art. 9(2)g.2

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19.1	Calculation of "Unrestricted Power of Windfarms"	disagree	Wind conditions (e.g. speed) are considered in the requirement. The practical calculation of the unrestricted power is up to the PGF owner and not in the scope of this network code.
19.1	The requirements defined in the NC which applies to offshore PPM connected in DC (Configuration 3 and 5) where the connection point is in DC, do not make sense especially those related to voltage and frequency. The requirements should be imposed on the DC/AC converter placed at the onshore substation.	partially agree	DC connections for Offshore PPM are removed from the scope of this network code to a forthcoming HVDC connection code.
19.1	Droop s1 for FSM - 20% is too high	agree	Droop is reduced from 2-20 % to 2-12%

ARTICLE 20 – VOLTAGE STABILITY REQUIREMENTS APPLICABLE TO OFFSHORE POWER PARK MODULES

Issue	**Different U-Ranges for Offshore PPM compared to Onshore PPM**
Section	Art. 20
Proposal received	• The voltage ranges set forth in table 8 shall apply to Offshore Power Park Modules of configurations 1, 2, 3, 4 and 5 within the time periods specified by table 8. For configuration 6 the voltage range shall be defined individually, pursuant to Article 4 (3). • Why specific requirements compared to PPM on-shore? The convertors in wind turbines onshore and offshore are identical. • The voltage stability ranges of configuration 6 should be set pursuant to article 4(3).
Evaluation	Disagree
Justification	• The voltage ranges for offshore PPM are not equal but similar to onshore PPM in order to cover the specific characteristics of the offshore configuration system (e.g. cable design). For further explanation of the voltage ranges see FAQ 20. • A link to Article 4 (3) is introduced in Article 16 (3) b. • The requirements for DC connections for Offshore PPMs have been removed from this code to a subsequent HVDC connection code

Issue	**Q-Ranges for Offshore PPM**
Section	Article 20
Proposal received	• The Reactive Power capability defined in Table 9 shall apply at all active Power output levels. Table 9 shall replace the requirements of Article 16 (3) (b) and (c.) for Power Park Modules connected Offshore. • All values in Table 9 revised to Unity Power factor, plus or minus an acceptable tolerance. This should apply at all active power output levels and Article 20 (2) should be deleted. • The reduced requirements specified for Great Britain are totally negated by the requirements of 20(2) preceding it. The requirements at and below full output should be coordinated and agreed pursuant to Article 4 (3).

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Evaluation	Disagree
Justification	• All reactive power requirements have been shifted to the connection point. It eases the understanding of the requirement. • The width of the maximum envelope has not been changed as it is in line with existing requirement. • The requirement for P/Q and U/Q shall indeed be consistent as the requirement for power below Pmax applies up to 99.9% Pmax, this will be done nationally as the shape of the diagrams will be chosen nationally. • Specifications on Article 16 (3) b are to be set while respecting the provisions of Art. 4(3). • Wide Q-ranges are essential for AC connected Offshore PPMs.

20.1	Proposal for a further developed table (example Continental Europe), the table shows an additional column for the "Allowed limitation in power generation (1 p.u. is Pmax), shall apply for configurations 3, 5 and 6. Argumentation is higher cost.	partially agree	The mentioned categories have been shifted to the scope of the forthcoming HVDC connection code.
20.2	Specify the fault Location for 3phase-symmetrical faults.	disagree	Fault location is always at the (offshore) Connection Point, as for all requirements in the code unless stated explicitly otherwise.
20.2	When referring to Article 16(3)(C)(4), What is the meaning of “in time-scales determined by the requirements of reactive power control”?	partially agree	agree; clarification; wording was changed in the current draft version to "The Power Park Module shall be capable of moving to any operating point within its PQ/Pmax profile in appropriate timescales to target values requested by the Relevant Network Operator.
20.2	When referring to Article 15(2)(A)(4), define “short term dynamic rating”.	agree	The referred to article has been revised. This specific point prescribes now 'short term dynamic Current rating (covering up to 0.4 seconds)'.
20.2	Why are the reactive power requirements at levels below maximum active power defined in accordance with Article 16 (3) (c.)? This appears a very onerous requirement and totally unjustifiable, particularly as some member states currently have obligations only to deliver unity power factor offshore. At the very least all offshore reactive ranges should be defined in accordance with Article 4 (3).	agree	Wording in Art 16(3)c of the final Network Code has been revised, prescribing the parameters to be defined while respecting the provisions of Art4(3).
20.3	When referring to Article 16(3)(E)(4), For what voltage range is the reactive power requirements valid?	disagree	Statement is not clear. The mentioned requirement refers to reactive power control modes and not to voltage ranges.

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ARTICLE 21 – ROBUSTNESS OF GENERATING UNITS REQUIREMENTS APPLICABLE TO OFFSHORE POWER PARK MODULES

Issue	**Robustness Requirements Applicable To Offshore PPM**
Section	Article 21
Proposal received	• Torsional stress is probably not applicable for offshore wind power because they are composed by multiple wind turbines and shall be treated as a whole system. • Wind power generator may contribute to power oscillation damping control only as long as wind conditions allow and taking into consideration technical capabilities. • Please confirm where the FRT requirements will be considered as applying – onshore connection point or offshore connection point. In line with observations made thus far for FRT, we would expect the requirement to be defined only for faults on the transmission system i.e. at an onshore point on the transmission system?
Evaluation	Partly agree
Justification	• The requirement on torsional stress has been deleted. • There has been a lot of investigation in the past regarding power oscillation damping of PPMs. From a technical point of view this is feasible and can be considered as state of the art for modern wind turbines. • The FRT-requirement which always applies on the offshore connection point has to cover both severe faults within the internal grid of the Offshore PPM and failures in the onshore transmission system. For faults (voltage down to zero) within the Offshore PPM the neighboring single offshore units shall have to ride through this fault. This would not happen, if the requirement applies at the onshore connection point. The overall aim is to limit the impact on the onshore transmission by an internal failure in the Offshore PPM.

ARTICLE 22 – SYSTEM RESTORATION REQUIREMENTS APPLICABLE TO OFFSHORE POWER PARK MODULES

Issue	**System Restoration**
Section	Art. 22
Proposal received	• The system restoration requirements defined respectively in Article 9 (5) (a), (b), and (d) shall apply to any Offshore Power Park Modules, irrespective of its configuration. According to the ACER Framework Guidelines on Electricity Grid Connections §2.1.3, this service is set out on a contractually-agreed basis. • Article 9, paragraph 4 (d) states that re-synchronization after tripping to auxiliary supply shall be performed by a circuit breaker on the voltage level of the Connection Point after a synchro-check. This arrangement is not possible with power park modules supplied by full-power frequency converters, because the synchronization is always performed by the converter by means of fly-start to the existing grid. Even in case of several parallel converter-supplied units, the fly-start to existing grid is needed for synchronization.

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Evaluation	Agree
Justification	• The requirement on Black Start Capability was revised to: *"If the Relevant TSO deems system security to be at risk due to a lack of Black Start Capability in a Control Area, the Relevant TSO shall have the right to obtain a quote for Black Start Capability from Power Generating Facility Owners."* This requirement sets no constraint or obligation on how the service should be procured. (See also other comments/responses given on the topic of Black Start Capability) • The requirement on re-synchronization was revised, deleting the reference to the circuit breaker functionality.

ARTICLE 23 – GENERAL SYSTEM MANAGEMENT REQUIREMENTS APPLICABLE TO OFFSHORE POWER PARK MODULES

23.1	Whether the requirements referred to in Art. 23 should apply should be determined pursuant to Art 4(3).	disagree	Reference to article 4(3) is given directly in the single requirements in the subparagraphs where needed and appropriate.
23.1	Add Word "surveillance" to Article 9) 6) b)	disagree	Wording is revised to "Power Generating Facilities shall be equipped with a facility to provide fault recording, dynamic system behaviour monitoring and the following parameters:"
23.1	When referring to Article 9(6)(F)(2), Change first sentence after dynamic simulations, to: The model shall include all relevant sub-models. Comment: Not all of the specified sub-models are relevant for wind power technology.	agree	"depending on the existence of the mentioned components" was added to the subparagraph

ARTICLE 24-27 – OPERATIONAL NOTIFICATION PROCEDURE FOR CONNECTION OF NEW GENERATING UNITS

Note: The Articles on Operational Notification for Connection of New Power Generating Modules have been strongly revised. This procedure is covered by Articles 24 until 32 in the final Network Code.

Issue	**Operational notification taking into account smaller mass-market units**
Section	Art 24-25-26
Proposal	Various comments refer to the feasibility of the three stage (EON/ION/FON) operational notification process for smaller mass-market units, in particular type A units. The main points raised are the following:

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	• Combination of EON/ION/FON in one certificate for type A and B units. • Clarification that LON does not apply to type A and B units. • Clear reference to standards by which authorised certifiers are registered with the RNO: „a) […] For type A units such certificate shall be accepted, provided that such certificate has been proofed with authorised certifiers (tests laboratories, credited according to EN 17025, and/or certification bodies, credited according to EN 45011). The accreditation should be given from the National affiliation of EA, European co-operation for Accreditation, established according to Regulation (EC) 765/2008.“
Evaluation	Agree
Justification	The Articles on operational notification for smaller units have been drastically streamlined: • Type testing by referring to European Standards and accreditation of certifying bodies have been elaborated. The main principles have been agreed on in a meeting with the DSO Technical Expert Group on 17 April 2012. The revised text has been discussed in the 2nd RfG User Group meeting on 2 May 2012. • Type testing is a sufficient means for compliance enforcement for type A PGMs. Operational notification is done by means of an Installation Document (see definition). • For type B and C PGMs the three stage operational notification procedure has been streamlined to a single stage. The operational notification procedure for new type B and C PGMs comprises a Power Generating Module Document (see definition). • The operational notification procedure for connection of each new Type B, C and D Power Generating Module allows for the use of a Equipment Certificate. (see definition)

Issue	**Information provision by RNO at an early stage**
Section	Art 24-27
Proposal	An obligation should be introduced for the RNO to provide relevant information for design studies at an early stage.
Evaluation	Agree
Justification	This is considered covered under Responsibilities of the Network Operator in Title 4 – Compliance. Timely provision of system data required for the studies is added to the list in Art. 35(3) of the final Network Code.

Issue	**Self-certification**
Section	Art 24-25
Proposal	Some stakeholders (mainly manufacturers) consider self-certification to be sufficient as the sole means of compliance verification. Some claim this for type A PGMs only, some for both type A and B.
Evaluation	Disagree
Justification	The LV directive allows for self-certification by manufacturers for safety issues. A clear list of situations covering this notion of safety is given in the directive. This directive is not considered to cover compliance with grid connection requirements to ensure reliable system operation. The definition of authorised certifier has been further specified to set this clear: „...an entity to issue Equipment Certificates. The accreditation of the Authorised Certifier shall be given from the national affiliation of the European co-operation for Accreditation (EA), established according to Regulation (EC) 765/2008.“ In the context of this network code only an authorized

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certifier can issue an Equipment Certificate for components used in a PGM and confirming performance in respect of the requirements of this Network Code.

24.2	Rephrase operational notification procedure as 'tests and calculatations'	disagree	The clause unambiguously refers to the entire Title 4 in which "testing and calculations" are part of the process, but these activities do not cover all of the operational notification process. The individual chapter headings within Title 4 make it clear when tests or simulations are covered.
24.2	General concern on TSOs as private companies granting authorisation for new power plants	disagree	TSOs regardless of their status as a state owned or private company perform a regulated function. Managing the connections to the network and evaluating requirements for these connections is part of the tasks granted to Network Operators (TSOs and DSOs).
24.2	Editorial. The PGF is compliant, not the PGF owner	agree	The compliance is related to the Power Generating Module not the PGF Owner.
24.4	Clarification needed on the registration of certificates with the RNO.	agree	Wording is revised. See definitions of Equipment Certificate, Installation Document.
24.4	Clarity on whether compliance refers to the facility or the unit.	agree	It refer always to the Power Generating Module.
25.1	Grid connection in the context of EON is not clear. Also it considers operation as a load and should as such be considered in a separate network code.	partially agree	Wording is revised with reference to the Connection Point (Art. 29(1) of the final Network Code). There is no reason to place an operational notification procedure in a demand code for internal auxiliary demand as this is part of the scope of this code. EON cover of auxiliaries is clarified. However, this entire operational notification process might be taken up in a separate network code on connection procedures to be developed at a later stage.
25.1	EON should not be applied when a new unit is integrated in an existing facility.	partially agree	The process is applied based on Power Generating Modules and Connection Points. If a further Connection Point is involved then the national details of the EON process may call for a further EON.
25.1	The EON phase should allow consumption of power as well, e.g. for auxiliary supplies, not only energisation of the installation.	agree	This has been made clear explicitly.
25.2	General wording to be clarified by appropriate use of terms.	agree	Agreed.
25.1	EON should allow a maximum of 5% production in order to allow appropriate testing, e.g. of differential protection.	disagree	An ION is needed prior to connecting the generator. This is required in order to manage the risks associated with energising. Protections can still be tested (e.g. by injection).

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26.2	A maximum time period (e.g. 2 months) should be included for the RNO to complete the data and study review process.	partially agree	This level of detail should not be prescribed at European level, but could be covered in further details at the national details.
26.1	To be clarified that in the ION phase the unit is allowed to generate power (instead of using the term 'operated')	agree	Wording is revised accordingly.
26.3	Editorial. With respect to data and study review the Relevant Network Operator 'shall have the right to request' the following from Power Generating Facility Owner	agree	Wording is revised accordingly.
26.3	Detailed technical data to be supplied by the PGF owner is to be coordinated first between PGF owner and RNO	disagree	The responsibility for the RNO to publish the list of required documents is prescribed in Art 30.3 (Title on Compliance, Article on Responsibilities of the Network Operator)
26.3	'Details of intended practical compliance tests' should make reference to the relevant Articles in the code.	agree	Wording is revised by referring to Title 4 Chapters 2, 3 and 4.
26.3	Request for details on confidentiality and cost allocation for studies to be performed in the ION phase	disagree	More details are provided in the Title on Compliance Simulation. Cost recovery by PGF owners for providing proof of compliance are out of scope of this network code.
26.4	Granting the RNO the right to give a shorter ION period inhibits the risk of discrimination towards PGF's.	partially agree	The text is modified to add "while respecting the provisions of Articles 4(2)" which refers to non-discrimination and optimisation in the objective differences in treatment of different generation technologies with different inherent characteristics,
26.4	Allow longer ION times for prototypes.	disagree	Such cases, which are not considered a common, should follow the process of a derogation with appropriate justification.
27.2	Criteria for receiving a FON are considered to be too hard. For some generation technologies more flexibility ('significant incompatibility') should be allowed.	partially agree	Using the notion of significant incompatibility creates more ambiguity. For PGMs of types A, B and C however, the ON procedure has been substantially simplified. For type D units, the criteria for granting a FON are not changed.
27.3	The maximum validity period for LON of 12 months is to be replaced by a reference to the timescales for expected solutions (Article 27b (3) b))	disagree	Period should be fixed for equality of treatment. For major repairs requiring longer periods, this also means longer periods of non-compliance which may justify formal derogations.
27.4	An advance message is required by the RNO when there is an incompatibility identified for the purpose of granting a FON, before finally refusing the FON.	partially agree	An advance interaction or clarification is still possible and not exempted by this code.
27.5	Further prolongation of the LON period should not be based upon discretion of the RNO and follow-up by a derogation, but reasonably related to the timescales as mentioned in Art 27b(3)b	disagree	This allows a proportional treatment in dealing with the specific situation.

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27.6	A RNO can only refuse operation of a unit after the LON has terminated without removal of the circumstances leading to this, if there is a risk on system security.	disagree	Adding this criterion would create more ambiguity and risk a discriminatory treatment of users. It could also be a bypass for the LON procedure. The sanction is needed to ensure equality of treatment, in context of owners who are not taking care to keep their plant compliant. If there is a major issue preventing compliance, the option to apply for derogation exists.
27.6	An advance message is required by the RNO when there is a persisting non-compliance after the LON period terminated before refusing operation of the unit.	partially agree	An advance interaction or clarification is fully compatible with the existing text. To achieve equitable treatment the RNO requires an ultimate sanction in the absence of reasonable efforts to rectify non-compliances.
27.6	Refusing of operation of a generator is a disproportionate power attributed to the RNO	disagree	Compliance is considered a crucial element of NC's on grid connection as prescribed in ACER's framework guidelines.
27.6	Operation of a unit after termination of the LON period cannot be refused if the unit provides ancillary services.	disagree	If there is a persisting non-compliance with this code, there is a clear justification for refusing FON, irrespective of services the unit provides.
27-1	End-of-life notification is missing in the operational notification process	agree	This is added for Type A in Art. 25(3) and again for Types B and C in Art 27(3): "On permanent decommissioning of a Power Generating Module the Power Generating Facility Owner shall notify the Relevant Network Operator in writing." For Type D this is not required as the distinct staged ON process already covers this within LON (requirement to notify changes).

ARTICLE 28 – OPERATIONAL NOTIFICATION PROCEDURE FOR CONNECTION OF EXISTING GENERATING UNITS

Note: Article 33 in the final Network Code.

Issue	**Retroactive application – Filtering process / preparatory stage**
Section	Art. 28.2
Proposal	Suggestion from Power Generating Facility Owners to be involved in the filtering process and more generally request from stakeholders to be associated early in the process.
Evaluation	Disagree
Justification	The filtering process is a preliminary phase aiming at identifying if during the quantitative cost-benefit analysis, a retroactive application to existing generating units would likely lead to a positive result. This network code is forward looking toward connection requirements for new units. This phase does not involve decisions impacting existing units. Retroactive application will only be pursued in clearly socio-economic benficial cases, based on public consultation and NRA approval. The explicit description of a filtering stage / preparatory process is to not waste

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	resources (both of the TSO and of grid users). To more appropriately reflect the objectives sought by this preliminary process, the network code now includes the following changes: • It provides for a so-called "preparatory stage" (instead of the filtering process). • Furthermore, the concept of qualitative cost-benefit analysis has been replaced by a ‚qualitative comparison of costs and benefits related to the requirement under consideration for application to Existing Power Generating Modules taking into account network-based or market-based alternatives, where applicable'. Involvement of stakeholder, including the power generating facility owners, in full transparency, is foreseen during the consultation phase.

Issue	**Retroactive application – quantitative Cost Benefit Analysis (CBA)**
Section	Art. 28(2) to 28(6)
Proposal	Stakeholders such as power generating facility owners and DSOs suggest increased involvement in the cost-benefit analysis (CBA) process, which should furthermore guarantee transparency and non-discrimination. More particularly, the following was being sought: - joint decision between power generating facility owner and TSOs regarding the selection of requirements subject to retroactive application; - involvement of DSOs in the evaluation of costs of imposing requirements to determined categories of existing units; - outcome of the public consultation binding upon the TSOs.
Evaluation	Partially agree
Justification	The Framework Guidelines provide that retroactive application is decided by the NRA based on a proposal from the relevant TSO and following a public consultation. The suggestion to have such retroactive application decided jointly between the Power Generating Facility owners and the TSO is therefore not in line with the Framework Guidelines and could, in practice, appear difficult to implement. Furthermore, according to the Framework Guidelines the modalities according to which both power generating facility owners and DSOs contribute to the CBA are the following: - as grid users, they should provide the relevant data and offer their assistance if necessary during performance of the CBA, and - they can participate during the above mentioned consultation process. DSOs can provide beneficial input during the CBA process, especially as far as smaller generating units connected to DSOs are concerned. The provision has been improved to clarify that grid users, including the DSOs, may assist during the CBA. This provision has furthermore been improved to clarify the implications of the public consultation and to require more explicitly that TSOs take its outcome into due consideration.

Issue	**Retroactive application - Transition period**
Section	Article 28.2
Proposal	The lenght of the transition period within which the existing significant user has to apply the new

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	standard and requirements should be five years (and not two years)
Evaluation	Partially agree
Justification	The two-year period as provided in Article 32.2 reflects the transition period provided in the Framework Guidelines. To enhance compliance with the Framework Guidelines, the revised version provides that this transition period shall be consulted upon and should not exceed two years as from the decision of the NRA on the applicability as the case may be.

28.2	A better explanation is needed at what stage the proposal by the TSO to the National Regulatory Authority will be give	disagree	Article 28(3) provides that "prior to making a proposal to the National Regulatory Authority as described in paragraph 2, the TSO shall carry out a quantitative cost-benefit analysis and a public consultation". Article 28(6) provides that the proposal for application to existing users will be submitted to the NRAs: 1) following the Cost Benefit Analysis (filtering process & in-depth CBA) and 2) the decision to proceed and to submit a proposal to the NRA is made depending on the outcome of the public consultation. The NC therefore identifies at which stage the proposal will be submitted to the NRA.
28.3	Editorial- redundancy between § 1, 3 and 4 on reference to the quantitative CBA	agree	Provision is restructured to make the sequencing of the relevant phases clearer .
28.5	Risk of TSO being partial in the CBA process- CBA should be done either by an independent certified chartered accountant or by a state authority	disagree	ACER's FWGL prescribes that the TSO shall perform the CBA
28.6	It is unclear with what the compliance is needed. To keep the process non-discriminatory, not only the TSOs but also involved stakeholders should agree on the report to be provided to the NRA post consultation	partially agree	**Partially agree**: Suggestion that the decision/report on the selection of requirements being subject to retroactive application is agreed jointly by the relevant TSO and the Power Generating facility before submission to the competent NRA is not in line with the relevant provisions of the Framework Guidelines (decision by the NRAs following a proposal from the relevant TSO). This might furthermore be difficult to implement in practice (e.g. the different power generating facility owners concerned could have diverging views). Hence the report shall reflect the stakeholder's view on the issue, but does not have to be agreed with them. This is already considered by requiring the report to include the consultation outcome. **Agree**: the provision is further clarified to indicate more clearly that compliance relates to the requirements which will apply "retroactively" to existing users.

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28.7	Amendment of existing contract- either longer period to be granted or considered as being unlawful	disagree	**Disagree:** 5 year period is not in line with the Framework Guidelines which mentions a three year period. **Disagree** re. comment on unlawfulness (EU regulation in principle prevails over national law / contracts).
28.8	Suggestion to merge that paragraph with Article 24	agree	Art. 28(8) is shifted to Art. 57 in the final Network Code.
28.8	Costs related to adapting the units to be taken into account	disagree	The CBA shall be performed on a socio-economic level as prescribed by the FWGL, thus it is not relevant to which parties costs and benefits are assigned.
28.3	Broader set up of the phase of filtering process is necessary. Laws and regulations outside the the technical field often will limit the application of new technical requirements respectively such laws and regulations have to be changed.	disagree	Comment not clear.
28.6	Criteria for decision making of NRAs should be included in the code to ensure legal certainty	disagree	Criteria for decision making of NRA may depend on national regulatory regimes, which are out of the scope of this network code.

ARTICLE 29 – RESPONSIBILITY OF THE POWER GENERATING FACILITY OWNER

Note: Article 34 in the final Network Code.

Issue	**Compliance monitoring obligations of the Power Generating Facility Owner- scope (1)**
Section	Art 29(1)
Proposal	Suggestio to better clarify the scope of application of compliance monitoring obligations of the Power Generating Facility Owner (→ which are the units which compliance shall be assessed by the Power Genarating Facility Owner).
Evaluation	Disagree
Justification	The scope of compliance monitoring obligations of the Power Generating Facility Owner is directly linked to the scope of application of the Network Code as such, as defined by Article 3 of the Code. Therefore, the compliance monitoring obligations encompass all 4 categories (A, B, C and D) of Power Generating Modules as descibed in Article 3 (6) of the Code. These 4 categories cover both Synchronous Power Generating Modules as well as Power Park Modules. In addition, the compliance monitoring obligations cover both Existing and New Power Generating Modules, which are deemed significant according to the provisions of the Network Code. The applicability of the NC to Existing Significant Grid Users stems directly from Article 2.1 of the FWGL. One needs to bear in mind that the NC is a document subject to future amendments pursuant to the procedure described in Article 7 of Regulation (EC) 714/2009. These amendements will be

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	linked to future developments of electrical devices. Therefore, one cannot exclude that the scope of application of the Code (and by consequence of the compliance monitoring obligations) might in the future cover other Power Generating Modules.

Issue	**Compliance monitoring obligations of the Power Generating Facility Owner – scope (2)**
Section	Art 29(1)
Proposal	Stakeholders suggest to better clarify the scope of application of compliance monitoring obligations of the Power Generating Facility Owner (→ what are the requirements which compliance shall be assessed by the Power Genarating Facility Owner).
Evaluation	Partially agree.
Justification	The Power Generating Facility Owner's compliance monitoring obligations pursuant to the NC are limited only to a verification that Power Generating Module is compliant with the requirements under the Network Code. The references to „national legislation including national codes" have thus been deleted since the NC cannot provide for the enforcement of national legislation. In addition, the compliance is to be assessed only against the requirements applicable to a particular Power Generating Module (i.e. requirements applicable specifically to Type C Power Generating Modules do not apply to Type A and Type B Power Generating Modules). The compliance shall be maintained throughout the lifetime of the facility. In case this is not possible (either given the subsequent amendments to the NCs or because of variations in performance of the facility over time), a request for derogation shall be made.

Issue	**Compliance monitoring obligations - financial aspects**
Section	Article 29(1)
Proposal	In the opinion of some comments provided, the following financial aspects should be taken into account: • Power Generating Modules should be incentivized (by means of bonus or penalties) to maintain compliance. • In addition, the costs of recording the performance of the Power Generating Facilities shall be borne by the Relevant Network Operator.
Evaluation	Partially agree
Justification	There is no legal basis for incentifying Power Generating Modules. The clause prescribing „The costs of the tests including necessary deviation from the commercially preferred operating point in order to facilitate the tests shall be covered by the Power Generating Facility Owner." has been deleted in line with an overarching principle of this code that cost allocations are not considered in the scope of this network code.

Issue	**Compliance monitoring obligations- practical implications**
Section	NC RfG reference – Article 29.4 (now 33.4) and Article 29.5 (now 33.5)
Proposal	According to some comments the following practical implications should be taken into account: • The tests shall be prescribed by the NC and not by each Relevant TSO/ Network Operator to avoid discrimination. • Certification bodies and standards (such as EN 45011) can be used in order to demonstrate compliance.

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	• A Relevant Network Operator's need to request the recording of the performance of the Power Generating Facilities shall be borne by the Relevant Network Operator. • The performance recording of the Generating Unit needs to occur at the Connection point.
Evaluation	Partially agree
Justification	The tasks of Network Operator in terms of compliance monitoring are described in Article 35 of the final Network Code. This article sets the common procedure that should be observed and which by consequence should decrease the discrepancies. Certification by authorized certifiers has been described in greater detail in the final Network Code (see also comments/responses on the operational notification procedure). Finally, the NC provides a legal basis for Relevant Network Operator to request the recording of the performance of the Power Generating Facilities. In this respect, it is also necessary that the Relevant network Operator has the possibility to attend the compliance tests on site (which is the current practice today). The test results cannot be assessed at the grid connection point only but may need e.g. to be checked in the Power generating Facility's control room. It is correct that in any case performance of the PGM at the connection point is verified.

29.4	Suggestion to delete the last sentence in para 4 "The purpose of this is to allow the Relevant Network Operator to evaluate and mitigate where necessary the consequential risks to the Network and to its users"	agree	Wording is revised accordingly.
29.5	RNO can record but at its own costs	disagree	Cost allocations are out of the scope of this code.

ARTICLE 30 – TASKS OF THE NETWORK OPERATOR

Note: Article 35 in the final Network Code.

Issue	**Compliance checks by the Relevant Network Operator – scope and periodicity**
Section	Art 30(1) and 30(2)
Proposal	• Suggestions to reduce the scope of Article 30 as regards to compliance and to suppress the requirement for a regular assessment of the compliance. • Furthermore, the right for the Relevant Network Operator to request compliance tests and simulation repeatedly throughout the lifetime of the Power Generating Facility is contested.
Evaluation	Disagree
Justification	The suggestion to exclude types A and B from the scope of this provision regarding compliance assessment by the Relevant Network Operator is not in line with the Framework Guidelines, and more particularly Article 2.4(2) which contains a general obligation to perform compliance testing to all significant users, regardless their respective category A, B, C or D. Note that with the revised operational notification procedure, the Equipment Certificate may be used for this compliance check where referred to in the code. Article 35 now provides that power generating facility owners will be informed of the outcome of

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	the compliance assessment performed on their respective power generating module(s). The publication of the outcome of the compliance assessment, which has been requested by some, would/could result in the publication of commercially sensitive data and therefore ultimately lead to market distorsions. It is therefore not required by the network code. The proposal made to suppress the requirement for a regular compliance check can not be reflected in the network code, since this is required by the Framework Guidelines. A new wording has nevertheless been introduced in Art. 35(2) to further clarify the circumstances under which repeated compliance testings would be carried out. It is now specified that the compliance checks and simulations will be performed according to a plan or general scheme for repeated tests and simulations defined while respecting the provisions of Article 4(3).

Issue	**Compliance checks – definition of required information at national level and not at EU level**
Section	Article 30(3)
Proposal	Some respondents suggested to have the information required for the compliance process defined at national level and not at EU level.
Evaluation	Disagree
Justification	The list mentioned under Art. 35(3) is considered to be the essential minimum with further details to be defined at national level.

Issue	**Compliance checks – third parties**
Section	Article 30(5)
Proposal	Performance of compliance monitoring by third parties should not be allowed
Evaluation	Disagree
Justification	The suggestion to delete this provision on confidentiality grounds could not be taken into consideration. Indeed, the Relevant Network Operator remains responsible for performing the compliance monitoring, even when it assigns the task to a third party. To reflect this, the wording ‚delegate' is replaced by ‚assign'. Also, the Relevant Network Operaton remains responsible for ensuring confidentiality is safeguarded by means of proper confidentiality arrangements and agreements. This is clarified in the text by amending ‚the Relevant Network Operator shall ensure compliance of Article 6 of this Network Code by appropriate confidentiality commitments with the assignee. '

30.1	Need to publish the compliance of each generating unit in order to ensure that some of them are not discriminated	disagree	This may result in publication of sensitive data of Power Generating Facilities which could lead to market distortion.
30.1	Monitoring must not include national legislation including national codes. Article 8 (7) of Regulation 714/2009 requires NCs to be limited to cross-border issues.	agree	Reference to national legislation including national codes is deleted.

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30.2	The costs in case generating unit fulfils the requirements to be borne by originator of the costs. The costs for the performance of compliance tests, including opportunity losses for the compliance activities are at the account of the Relevant Network Operator.	disagree	Cost allocation is out of the scope of this Network Code.
30.2	Compliance tests during the lifetime have to be carried out in conditions identical to the initial compliance tests.	disagree	This is impossible to achieve, because of environmental conditions and network condition which may change. However, for each test the actual external conditions have to be taken into consideration when evaluating the compliance, as prescribed in the requirements.
30.3	Reference to EC standards (CE marking)	disagree	Self-certification for compliance with connection requirements aiming at system security is considered to be not covered by the European LV Directive. (see also other comments/responses on operational notification).
30.3	The Relevant Network Operator has to make publicly available the list of information and documents to be provided as well as the requirements to be fulfilled by the Power Generating Facility Owner in the frame of the compliance process. Such list shall be included in the Technical Connection Conditions issued by the RNO and won't be modified without prior notice and sufficient delay for investors to adapt and notably, cover the following information, documents and requirements.	disagree	It is not fully clear, what is meant by "list of Technical Connection Conditions". This code as a whole prescribes the requirements for grid connection, which shall be supplemented by further national implementations of this code, as well as other connection requirements which do not cover cross-border and European market integration issues pursued in European Network Codes.
30.4	Use consistent terms compliance testing, compliance simulation and monitoring	agree	New wording of "compliance simulation" is added after "compliance testing".
30.4	In additional the relevant TSO will make available their requirements for compliance testing, including tests to be witnessed by the Network Operator or their agent.	agree	This is already covered by the "Common provisions on compliance testing" in the subsequent article.
30.6	The Relevant Network Operator shall be facilitated to participate to the test and measure on the grid connecting point of the Generating Unit by using its own equipment.	disagree	Tests cannot be verified by the Network Operator at the connection point only. Not all data and performance can be measured at the grid connection point (e.g. tripping to houseload test). Participation on site is common practice.
30.6	Additional subparagraph 7. The Relevant Network Operator shall fulfil all necessary requirements in his Network to secure a stable and safe operation of the Power Generating Facility during the tests as well as during normal operation (e.g. sufficient short circuit power, sufficient network protection, voltage. frequency etc.)	disagree	The Network operator cannot ensure stable operation of a Generating Unit during test, because this capability is to be tested and depends on the actual fulfilment of the requirements of this Network Code. Conditions for normal operation of Generating Units do not relate to compliance monitoring and are out of the scope of this article.

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ARTICLE 31 – COMMON PROVISIONS ON COMPLIANCE TESTING

Note: Article 36 in the final Network Code.

Issue	Testing of individual units to demonstrate compliance of the whole generation facility
Section	Article 31
Proposal received	The testing of […] the Power Generating Facility shall aim at demonstrating the fulfilment of the requirements of this Network Code. The testing of the individual Generating Units or components within the Power Generating Facility might be used to support testing and demonstration of compliance of the Generating facility as appropriate.
Evaluation	Disagree
Justification	The comment is in line with a request or misunderstanding for requirements to apply at the level of the Power Generating Facility. It is emphasized that this code covers connection requirements at the level of the Power Generating Module, but referred to the Connection Point. See the revised definitions of Power Generating Module and Power Generating Facility for further clarification. Also see the supporting FAQ document for further explanations on these concepts, including some typical schemes.

Issue	Appeal of Network Operator‘s decisions before National Regulatory Authorities
Section	Article 31
Proposal received	There should be a possibility for appeal against a decision of the RNO with the NRA.
Evaluation	Disagree
Justification	As stated in Answer to FAQ 15, settlement of disputes provisions are not included in the NC RfG. Power Generating Facility Owners have the possibility to contest a Relevant Network Operator‘s decision before the competent NRA or before competent courts based on national law of the relevant Member State.

Issue	Possibility to use tests performed on similar installations
Section	Article 31
Proposal received	To demonstrate fulfillment of technical or design data, values evaluated during type test of a similar generator (e.g. type test of first of its kind generator) shall be accepted. The testing of the individual generating unit shall be restricted to tests that only can be performed during commissioning of the unit (optimization or adjustment of settings e.g. PSS, governor system etc). A general test of all generating units without a clarification of the amount of tests cannot be accepted. Requirement article 31 to be modified/changed.
Evaluation	Disagree
Justification	This proposal is too broad to be acceptable since for each Power Generating Module compliance needs to be proven, not just for a type of generator. However, note that a reference to Article 4(3) has been added in Article 36.2 of the final Network Code to give the Power Generating Facility Owner the guarantee that the Relevant Network Operator‘s requests will be lawful, proportionate, non-discriminatory, and transparent. Moreover, the possibility to carry out tests on a smaller scale by type testing is already made possible.

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Issue	Mandatory requirements vs optional requirements
Section	Article 31
Proposal received	Compliance testing only for mandatory requirements under this NC. Prescriptions on compliance tests for additional features which are not mandatory according to this Network Code, may result in discrimination.
Evaluation	Agree
Justification	Note that the clause did not refer to non-mandatory requirements prescribed in the code. However, it is agreed that additional and optional features, not referred to in this code are out of the scope of the compliance enforcement part of this code. Article 31.2 d) is deleted.

Issue	Responsibility for personnel and plant during compliance tests
Section	Article 31
Proposal received	• Delete the clause prescribing „The PGF Owner is responsible for safety of personnel and the plant during test„ because liability is a matter for national law. • The Power Generator Facilty owner shall have the right to refuse the test for safety reasons of its personnel
Evaluation	Disagree
Justification	• This article is necessary to clarify who takes care of the safety of the personnel. Moreover, this article is consistent with Article 31.3 : since the Power Generating Facility Owner is carrying out the tests, it shall be reponsible for the personnel on site during the tests. • The Power Generating Facility Owner being responsible for the safety of the personnel, does have the possibility to suspend tests in case of safety issues. However, the safety of the personnel shall not allow the Power Generating Facility Owne to simply refuse its fulfillment of mandatory compliance tests.

Issue	Simulation vs testing
Section	Article 31
Proposal received	A test can be demanding in terms of aging etc. Therefore whenever possible and reasonable a simulation shall be prefered.
Evaluation	Partially agree
Justification	A practical test is in some cases better evidence of compliance. Also, quality of simulations depends on the quality of the simulations models.

Issue	Delay in compliance testing
Section	Article 31
Proposal received	The RNO should not delay the testing process.
Evaluation	Agree
Justification	Addition of “The Relevant Network Operator shall make its reasonable efforts to cooperate and not unduly delay the performance of the tests.” in Article 31.3.

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31.1	Should not apply to small installation	partially agree	Compliance enforcement for smaller units has been revised, based on Equipment Certificates.
31.2	Need to add reference to Art 4 (3) in Art 31(2), especially as it opens the possibility for the RNO to require additional tests.	agree	Reference to Art 4(3) is added in Art. 36(2) of the final Network Code.
31.2	Add preconditions that tests are sustainable, plausible and without demolition of the facility	partially agree	Reference to Article 4(3) is added which implies generators that tests will be perform in a lawful, transparent, proportional and non-discriminatory way.
31.2	Item c) on additional tests with alternative fuel mixes to be deleted	disagree	No proper justification is given for refusing alternative fuel tests. Note that a decision on this is taken while respecting the provisions of Art 4(3).
31.2	If Title 4 Chapter 2, 3 or 4 is not sufficient to demonstrate compliance to the Network Code these Chapters have to be adapted that the test described are sufficient.	disagree	This is not an opening clause for additional tests, but rather an option to allow for other tests, if the PGF Owner provides insufficient information.
31.4	Make explicit reference to the nuclear units.		Article 31 is a common provision and is applicable to all generators, not only nuclear plants. Safety of the personnel is obviously necessary for all power generating facilities.
31.5	The RNO should pay the costs if test are relevant for common grid belongings, application of originator of costs principle	disagree	Reference to Article 4(3) in Article 31.2 gives Power Generating Facility Owner the guarantee that Relevant Network Operators requests will be lawful, proportionate, non-discriminatory, and transparent. In addition, as an overlying principle throughout this code, cost allocation is not in the scope of this network code.
31.6	Involvement of the manufacturer in on-site tests should be deleted from this code. Ownership boundaries are to be respected.	agree	It is agreed that the manufacturer does not need to automatically participate to the tests. This decision is up to the Power Generating Facility Owner who is responsible for the compliance of its installation with this code. Reference to the manufacturer is deleted from this clause.
31.6	The cost of remote compliance testing participation can be significant for A, B and C units. Giving the Relevant Network Operator the right to demand such remote data transmission without considering costs would be unfair.	disagree	This is not about "on site" **or** "remote". Both options shall be facilitated.
31.6	The Network test team should comply with the powerplant standard safety requirements to operate during the tests	partially agree	The principle is acknowledged, but this specification is out of the scope of this Network Code which deals with connection requirements.
31.6	The overall security of the system is dependent on the behaviour of millions of small units. It is essential that these are compliant with the assumptions in the code, and that there is a robust and legally enforceable method to ensure that only compliant equipment is installed in the mass market.	agree	The operational notification procedure and the linked compliance enforcement for smaller units have been streamlined accordingly.

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31.6	Testing is always dependent on the wind conditions - on site tests are therefore time and cost intensive. In the Network Operators' control center is it also not always possible to see all the required parameter which are necessary to evaluate compliance test results.	disagree	The possibility to participate from the control centre is an option that should be available. Because this option is probably not always the sufficient, e.g. to test wind generators, this is no argument to delete this option.
31.6	Why and when will the TSO use its own equipment and why and when not?	disagree	Tests cannot be verified by the Network Operator at the connection point only. Not all data and performance can be measured at the grid connection point (e.g. tripping to houseload test). Participation on site is common practise.
31	Add "or national law including national codes at each point where the requirement are topic	disagree	Comment is not clear.

ARTICLE 32 – COMMON PROVISIONS ON COMPLIANCE SIMULATIONS

Note: Article 37 in the final Network Code.
Note: Many comments provided on this Article are identical to comments given on the ‚Common Provisions on Compliance Testing'. These comments, nor their responses are repeated here.

32.3	Add that the simulation model must be validated by accredited certification body under EN 45011	disagree	The simulation model is to be validated against the compliance tests. This shall be demonstrated by the PGF Owner to the Relevant Network Operator. The code should not prescribe who validates it. It is considered to be validated, if the simulation results are in line with the test results.
32.3	Compliance simulation must be agreed between RNO and Power Generating Facility Owner .	disagree	Article 32 deals with simulations which can performed by the Relevant Network Operator on its own. It is already stated that such simulation will be "based on the provided simulations reports, simulation models and compliance test measurements". Article 32(4) states that the Relevant Network Operator has the right to check compliance by carrying its own compliance simulations. A Relevant Network Operator always has the right to conduct its own simulation without having to agree with Power Generating Facility Owner first.
32.3	Suggetion to modify Article 33 (3) in a following manner: "The Power Generating Facility Owner shall produce and provide a validated simulation model for the Power Generating facility and if requested by the relevant network operator for the Generating Units"	disagree	Models are needed on Generating Unit (Power Generating Module) level as prescribed by Article 10(6) (c) in the final Network Code and in line with the overlying principle that connection requirements are set at the Power Generating Module level in this code.

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32.3	Provision of simulation result: This should be limited to a reasonable extend during the early phases of power plant live; i.e. during design/planning phase in order to allow a proper design. Formats, should not be defined but block diagramms and parameters should be exchanged. Models should be validated by both parties. The level of detail should be adapted to the needs and possibilities, e.g. protection models not mandatory etc.	disagree	The proposals are too vague to specify the characteristics of simulation models. Reference to Article 10(6)c of the final Network Code is therefore needed.
32.3	Power Generating Facilty Owner shall not be requested to provide models just in the specific format of RNO´s software.	partially agree	In this paragraph only the coverage of the model is referred to. However, according to Article 10(6)c of the final Network Code the format of the model shall be specified by the Network Operator while respecting the provisions of Art 4(3).
32.4	Compliance test must be done in accordance with project schedule and in interaction with the owner	disagree	This article deals with simulation which can performed by the Relevant Network Operator on its own and it is already stated that such simulation will be "based on the provided simulations reports, simulation models and compliance test measurements". This paragraph 4 states that the Relevant Network Operator has the right to check the compliance by performing its own compliance simulations. A Relevant Network Operator always has the right to conduct its own simulation without having to agree with Power Generating Facility Owner first.
32.4	add a paragraph stating 'The Relevant Network Operator and the TSO shall hand over free of charge to the Power Generating Facility Owner the technical data and the simulation model of the network and power system, in the extent necessary for carrying out the requested simulations in which the power system take spart and affects to the simulation.'	agree	A paragraph following the main principle is added to state this explicitly.
32.4	What to do in case of contradictions/deviations in test or simulation results?	partially agree	No general outcome on this can be provided. The option for additional tests is prescribed in the code.

ARTICLE 33-42 – COMPLIANCE TESTING

Note: Article 38-44 in the final Network Code

Issue	**Certification for compliance with this Network Code**
Section	Art 33-48
Proposal	A main part of the comments received on the Compliance Title of this code reflected on the

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	certification of small mass-market Power Generating Modules: - Manufacturers declaration and type approval should be sufficient for Type A Units. Generator units of type A are products which meet the requirements of the compliance evaluation according to the Low Voltage Directive, and for which the manufacturer must in any case declare that they are compliant. Additional compliance evaluations would only increase the costs without generating additional benefits. - Registration shall be based on EU standards (e.g. CE marking) - Simulation and testing is not reasonable for type A and B - Requirements for compliance tests and simulations should be specified in European standards - Clarification is needed on registration of certificates with the RNO.
Evaluation	Partially agree
Justification	Type testing is allowed for type A Power Generating Modules considering the mass amount of units (see also the streamlined operational notifciation procedure in this respect). Self-certification based on CE marking for safety issues is not considered relevant for compliance testing on grid connection requirements as this safety aspect is considered to be not covered by the LV directive. The accreditation of the Authorised Certifier shall be given from the National affiliationof EA, European co-operation for Accreditation, established according to Regulation (EC) 765/2008. Compliance tests and simulations are as such covered by type tests for type A Modules as a whole. For type B-C-D Modules type testing can be accepted for parts of the Modules, as referred to in Equipment Certificates (see definition). For type tests, standards can be a complement to the compliance test requirements in the NC. In addition, standards are assumed to cover also technical characteristics out of the scope of the NC RfG. In this operational notification procedure it is clarified that not an individual registration of test results per type A Module is envisaged. The notion of Equipment Certificate states the link between the type test results of the Accredited Certifier and the registration with the Relevant Network Operator.

Issue	**Simulated frequency deviation signals**
Section	Art 33.2
Proposal	With regard to LFSM-O and FSM test for type B and C Synchronous Power Generating Modules, speed governor and the load controller may be in one integrated controller
Evaluation	Agree
Justification	Wording has been revised.

Issue	**Exemptions for compliance tests for nuclear facilities**
Section	Art 33.2
Proposal	Need for Primary Tests for Nucler Power Plants shall always be evaluated with CBA and Nuclear Safety shall always take into account. Nuclear Power Plants are to be exempted from FSM and LFSM-U response test, as well as black start response tests.
Evaluation	Disagree
Justification	Compliance testing, simulation and enforcement is an essential element for a correct implementation of the Network Code (see also ACER's framework guidelines Section 2.4). The code is technology neutral. Even as nuclear units for historical reasons did not participate in

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	frequency response in some regions, this is not a valid argument to maintain this situation. In other regions nuclear plants have successfully provided FSM already. The comment that FSM for nuclear units is not legal, does not provide adequate argumentation to the comment proposal. For the avoidance of doubt, it is again stressed that this connection code aims at new units. Where well founded arguments exist for non-compliance, the derogation procedure can be invoked. Existing units only need to comply if the procedure of Art 3(2) of the code is compleely run through.

Issue	**Exemption of micro-CHPs for compliance tests**
Section	Art 33
Proposal	Micro CHPs to be excluded as they are unable to deliver these tests
Evaluation	Disagree
Justification	No technology is a priori derogated from the network code. A general clause is added for industrial sites with a focus on critical loads and on CHPs considering rigidly coupled steam demand. For specific technology related issues, a request for exemption is to follow the derogation procedure which allows class actions.

Issue	**Short Circuit Ratio compliance test**
Section	Art 34.3
Proposal	Open and Short Circuit Saturation Characteristics test need to be linked to a requirement of the network code. A differentiation is needed in Short Circuit Ratio depending on the size of of the Module
Evaluation	Agree
Justification	The compliance on short circuit ration test has been removed as there was no clear link with a connection requirement in this code.

Issue	**Publication of type C accepted MD&PTCs**
Section	Art 35
Proposal	To prevent discrimination, the list of all (type C and D) Generating Units which were tested and which was certified according to MD&PTCs is to be published
Evaluation	Disagree
Justification	This is confidential information. The RNO will publish which accreditation standards are valid for certifying bodies. To have a better view on how Equipment Certificates can be used, Article 26 of the final Network Code states „The Power Generating Facility Owner is advised to check with the Relevant Network Operator at an early stage of a project what parts, if any, are acceptable instead of the full compliance process and how to proceed to make use of this facility.“

Issue	**Link between compliance tests and code requirements**
Section	General
Proposal	A compliance test for a non-mandatory requirement only applies in case the requirement is set on the Power Generating Module.

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Evaluation	Agree
Justification	This is clarified throughout the text. E.g. for the Black Start Capability Test: „Power Generating Modules with Black Start Capability in accordance with Article 10(5)a, shall demonstrate this technical capability...“ For this reason RES is not exempted from these compliance requirements by the code itself.

Issue	**Trip to house load test**
Section	Art 35.6
Proposal	Trip to house load test should be a type test or alternatively only performed once. The test should be at different situations than nominal Active and Reactive Power because this depends on the grid conditions. The conditions for this test can be made more clear.
Evaluation	Partially agree
Justification	The ability to properly deliver the capability depends not only on the design, but also on the construction and other parameters due to which type testing does not provide sufficient justification for compliance with this requirement. Regular tests of Trip to Houseloads are already performed nowadays. Also the prescribed test conditions of nominal active and reactive power are common practise and can be established. Further conditions are clarified by reference to the related requirement.

Issue	**Excitation system response test**
Section	Art 35.6
Proposal	Excitation system response is too detailed or out of the scope of this code
Evaluation	Agree
Justification	Successful tripping to houseload is the required functionality and shall be demonstrated. Further details on control and excitation system response are out of the scope.

Issue	**Reactive Power Capability test**
Section	Art 35.7
Proposal	1. The test can not be performed in the absence of an OLTC transformer without risking tripping due to extreme voltages. 2. 15 OLTC tap movements in 4 minutes is not always possible. 3. Only required at Maximum Active Power, not at other Active Power operating points 4. The test should last less than one hour for all given operating points
Evaluation	Partially agree
Justification	1. Agree with the identified risk. However, this is not an issue for the test, but rather for the voltage range requirement. 2. The condition of 15 tap movements in 4 minutes is removed as it is an operational aspect. 3. Compliance at operating points below Maximum Active Power is relevant as there is a specific requirement on this. Assuming this will be complied with a priori is not accepted. 4. A compliance test of one hour is deemed reasonable as this operation may be required for these time frames in cases of low voltage disturbance. See e.g. Art. 10(2) with a time period of 60 minutes for 0.85-0.90 p.u. in Continental Europe.

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Issue	Compliance tests for type D Power Generating Modules
Section	Art 36
Proposal	Several comments were made on complexity, references and point of application
Evaluation	Agree
Justification	Due to revisions of the requirements for type D Power Generating Modules, the compliance test of the Modules are shortened extremely, covering only those for type B and C.

Issue	Description in keywords
Section	Art 37
Proposal	Voltage Control, Reactive Power Control or Power Factor are not cross-border network issues. Those requirements do only affect local distribution networks. They are not relevant for the European transmission network.
Evaluation	Disagree
Justification	Comment is not relevant for the compliance test, but applies to the related requirement. Reactive power capabilities are clearly considered to have a crossborder impact based on their impact on system voltage stability.

Issue	FRT compliance tests for type B Modules
Section	Art 38
Proposal	FRT compliance tests need to be included, based on standards. Also, compliance simulations on FRT type B units bring no added value if there are no tests to validate these
Evaluation	Disagree
Justification	See FAQ 24 Tests on-site are not possible for these types. Only a type test does also not give the full proof for compliance with the requirement. The FAQ explains how type testing and national implementation of the requirement (e.g. pre-fault conditions, grid impact) need to be looked at together.

Issue	Active Power Controllability and control range test
Section	Art 39
Proposal	Active Power Controllability and control range test details are to provide more flexibility considering fluctuating conditions (wind solar), e.g. based on 1-min averages.
Evaluation	Disagree
Justification	An accuracy range is already provided in the requirement for slight fluctuations of e.g. weather conditions. It is not appropriate to consider 1-minute averages, given the Maximum Capacity of a single unit (type C).

Issue	FSM response test
Section	Art 39
Proposal	FSM test is not to be based on frequency steps as these can trigger protection devices
Evaluation	Agree
Justification	The possibility of ramps is introduced

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Issue	Reactive Power capability test
Section	Art 39
Proposal	1. Full leading or lagging in reactive power capability tests is not feasible as it will impact grid voltage, possibly exceeding limits. 2. There should be no test on activation time of reactive power capability. 3. Combination of Reactive Power Control modes can be requested by Art 16. In the test however, only one can be used.
Evaluation	Partially agree
Justification	1. Test conditions are common practise and can be established. 2. It is not provided in Art 15. There is a test requirement on achievement time of the output (1 second). Wording of the compliance test is revised 3. Art. 16 has been revised; the statement of combinations of operation modes has been removed.

33.2	Art 33.2a has no purpose	disagree	The test refers directly to the LFSM-O requirement.
33.2	Reference to requirements for insensitivity, Droop, deadband, range of regulation, and dynamic parameters in Article 7 are not correct	agree	Wording is revised.
34.3	Type testing should be allowed for Open and Short Circuit Saturation Characteristics	agree	For type C and D units type testing is still allowed as verification of part of the compliance. Note however that the compliance test on Open and Short Circuit Saturation Characteristics has been removed.
34.2	no additional tests needed for type B units, compared to type A	disagree	Disagree. No proper justification given.
35.2	Clarification of type C -Synch Gen - FSM test	agree	Clarification is to be provided in detailed test specifications or standards at the national level.
35.2	FSM test - droop setting	general statement / out of scope	Clarification. Only a single setting needs to be provided, but the unit needs to be capable of setting each possible value in the range given in Art 9.2.c The eventual setting applied is out of the scope of this code.
35.2	incorrect references	agree	Agreed. References corrected
35.2	Definiton of Frequency Restoration Control is needed.	disagree	No definition is needed, the service is described in Art 10(2)e and to be further specified while respecting the provisions of Art 4(3). Capital letters are removed.
37.1	A test on FRT compliance for type A units is needed.	disagree	FRT requirements are not required for type A Power Generating Modules in this code
38.2	Editorial mistake. Replace Synchronous GU by PPM	agree	Wording revised.

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39.2	Term 'Limited Active Power Control Mode' not defined or used in the code	agree	Wording revised.
39.3	improve wording	agree	Wording revised.
39.4	Definition of Frequency is missing	agree	Definition added
39.4	Speed governor does not apply to wind turbines.	partially agree	The clause says 'if applicable'
39.4	speed governor and load controller may not be control design in all technologies.	agree	Wording revised that the compliance test results are to be met without referring in too much detail to the control scheme design.
39.6	editorials	agree	agreed
39.7	insensitivity is not used in the Reactive Power capability requirement.	disagree	Art 16 refers to steps in voltage no greater than 0.01 pu
39.7	editorial	agree	accepted
39	Compensation of reactive power on lines or cables is not mentioned in the PPM complance test articles.	partially agree	Art 16.3.b.3 states this is the responsibility of the owner of the cable or line. As such it is not included in a compliance test for a unit or PPM.

ARTICLE 43-51 – COMPLIANCE TESTING

Note: Article 45-51 in the final Network Code

Issue	**Island Operation and Block Loading simulation**
Section	Art 45.4
Proposal	1. Transients should be allowed up to 3Hz or at least the available frequency range. 2. Inherent technical limitations need to be taken into account 3. Island detection should be allowed based on switchgear position signals in smaller systems.
Evaluation	Partially agree
Justification	1. This is a compliance test, this means that the effect needs to be proven under reasonable conditions. Given that islanding is linked to a system event in which a frequency deviation could exist, 1 Hz is considered a reasonable but maximum allowed margin. 3 Hz would surely be over-optimistic on the pre-event condition. 2. Inherent technical limitations are to be covered as mentioned in Art 9.5.b "if required by a decision of the Relevant Network Operator pursuant to Article 4(3)" 3. Comment applies on the requirement, rather than on the compliance simulation. Art 9 mentions "if required by a decision of the Relevant Network Operator pursuant to Article 4(3)".

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Issue	**Power Oscillations Damping Control simulation**
Section	Art 46.2
Proposal	• Comments on the frequency range for the PSS damping (should be wider). • Request to remove compliance simulations on this topic • The requirement should be made more general to PSS functions to allow for other technical solutions (e.g. in AVR control) • This is not of technical state of the art and not an inherent function of inverter based technologies.
Evaluation	Partially agree
Justification	• Given the case specific nature of this requirement, numerical values will not be defined in the Network Code and are to be specified by the Relevant TSO. • The simulations are of relevance, no argumentation is given for the proposal for deletion. The specifications have been simplified in the NC however. • Requirements on PSS refer to functional PSS capalities. • This is no justification for removing it from a code which is to be future proof. In addition, general requirement states it is implemented „ if required by a decision by the Relevant TSO pursuant to Article 4(3)“

43.3	Specify high frequency ranges for LFSM-O simulation tests	agree	Reference made to Art 8(1) a.
43.3	LFSM-O simulation refers to Minimum Regulating Level instead of Maximum Capacity	agree	Wording revised.
43.3	LFSM-O simulation - only a single droop setting is to be tested for	agree	Wording revised.
45.2	editorial	agree	Accepted. Wording revised.
45.2	editorial	agree	Accepted. Wording revised.
46.1	conditions on when to perform simulations for type D synchronous generators	disagree	From the comment it is not clear if more or less simulations are proposed, or which criteria on which to make the decision are proposed.
46.1	application of type A, B and C compliance tests to type D	agree	Wording is clarified. Type D compliance test on FRT overrules that of Type B.
46.2	Power Oscillations Damping Control simulation - clarification 3 seconds hold	agree	Wording revised to avoid PSS being constrained for 3 seconds
46.2	Power Oscillations Damping Control simulation - to be clarified that this not always require a PSS, modern AVR can provide the same functionality	agree	Focus is put on PSS functionality. Still compliance needs to be demonstrated.

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47.1	editorial	agree	Wording revised.
48.2	PPM to be exempted from Island Operation and Block Loading.	disagree	No justification given.
48.4	editorial	agree	Accepted. Wording revised.
48	change title so that it refers to Generating Units instead of PPM	disagree	Not accepted. Requirements and simulations refer to PPMs

ARTICLE 52-56 – DEROGATIONS

Issue	**Application of provisions of the NC to existing generators**
Section	Art. 3 para 2, Art. 28 (new 33), Art. 55 (new 56)
Proposal	Relation between the articles should be clarified; should be clearer under which circumstances the provisions of the NC apply to an existing generating unit
Evaluation	Disagree
Justification	The NC is clear that, in principle, it applies to new generating units only. Art. 3(2) seths forth conditions under which the NC applies to existing generating units. Art. 55 describes procedures if a derogation is required, be it for a new or an existing generating unit.

Issue	**Legal Review by Courts of Law / Appeal Procedures / Dispute Resolution**
Section	Art. 54(7)
Proposal	A proposal is made to introduce multistage appeal procedures. There is also a demand to define as to when an issue should be heard by the competent courts. Further, it was proposed that the commencement of court proceedings or of administrative proceedings should trigger a transition period during which the generating unit does not need to be compliant with the NC until such court or administrative proceeding has come to a conclusion.
Evaluation	Disagree
Justification	As stated in the FAQ to the NC, the NC will contain no provisions on dispute resolution, court proceedings, administrative proceedings and the like as all of this is left to national legislation, especially national administrative law. Firmly, based on the principle of subsidiarity these are issues to be resolved on a national level.

Issue	**Derogation Procedure / Right of Manufacturers to Apply for Derogations**
Section	Art. 52 (new Art. 53)
Proposal	Manufacturers should be allowed to apply for derogations.
Evaluation	Disagree
Justification	The NC does not put obligations on manufacturers. However, note that Art 52(2) allows for mass derogations, to be initiated by the TSO: “It shall apply as well to Network Operators when applying for derogations for classes of both existing and new Power Generating Modules connected to their Network.”

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Issue	Derogation Procedure / Involvement of DSOs
Section	Art. 52(3) and 52(4)
Proposal	It has to be the relevant TSO that handles the request for derogations and, if there is one, performs the CBA, not the DSO.
Evaluation	Disagree
Justification	Involvement of the DSOs is relevant. Coordination with the Relevant TSO is added in Art. 52

Issue	Derogation Procedure / Derogations for a whole synchronous area
Section	Art. 53 (new Art. 54)
Proposal	ENTSO-E should have the right to apply for derogations for a whole synchronous area
Evaluation	Disagree
Justification	It is not foreseen in the FWGL that ENTSO-E takes any decisions regarding derogations for synchronous areas. Such power is not conferred on ENTSO-E and to whom should ENTSO-E submit such a request? According to the FWGL decisions regarding derogations are to be taken on a national level.

Issue	Refusal of Network Operator to Connect a Generating Unit Not Compliant With the NC to the Grid
Section	Art. 55(2)
Proposal	As such a sanction is not explicitly mentioned in regulation 714/2009 the relevant Network Operator should not have the right to refuse connecting a non-compliant Generating Unit.
Evaluation	Disagree
Justification	Compliance of a Generating Unit with the provisions of the NC contributes to the safety of supply and a safe operation of the grid. Further, if a relevant Network Operator was obliged to allow access to the grid despite the Generating Unit not being compliant with the Network Code, there would be no need to ever comply with the provisions of the Network Code. Moreover, connecting a non-compliant Generating Unit to the grid could trigger liability issues.

52.1	For minor derogations a shorter derogation process without involving the National Regulatory Authority is necessary	disagree	First of all, where to draw the line between minor and major derogations? What should be the standard against which to measure? Further, the FWGL clearly states that "the relevant NRA shall decide whether or not to grant a derogation" and it provided for a register of derogations. Thus, a distinction between minor and major derogations is not foreseen in the FWGL.

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52.2	The generating facility owner shall have the right to insist upon a cost-benefit analysis to be performed by an independent authority, in cases where the TSO has not performed one and refused derogation.	disagree	The assumption underlying this comment is wrong: It is not the TSOs that grants derogations but the NRA, cf. Article 54(7). Furthermore, a CBA by an independent authority is not foreseen in the FWGL and such a procedure would lead to a host of related questions, i.e. who pays for it, how to choose such an independent authority. Additionally, the NRA decides upon the request of the TSO not to have a CBA. Finally, even if the NRA rejects an application for a derogation, the Owner of a Generating Unit concerned may still appeal to a court of law and may challenge such a decision. In such a case, there will be an independent review of the whole process.
52.3	Cost-benefit analysis performed by the Relevant TSO or by the Relevant DSO in coordination with the Power Generating Facility Owner. Generator needs to give input for the cost-benefit analysis.	agree	Art. 33 provides for the assistance and contribution of the Power Generating Facility Owner when it comes to the CBA. Therefore the reference to this Article have been made.
52.4	Derogation process must also take into account the constraints derived from other public priorities (fields environmental protection, urban planning regulations, nuclear safety regulation etc.).	agree	The words "in particular" are inserted in Art. 52(3) to clarify that the CBA outcome is a main argument, but not the only one.
53.0	For transparency and non-discrimination. Add Art 7: If the TSO or DSO apply for derogation regarding defined generating unit, which derogation would change the requirement to more demanding or sticker direction, it must inform the Owner. The NRA shall hear the Owner before deciding granting the derogation	disagree	First of all, it is not clear what precisely is meant. Secondly, assuming that the idea behind this comment is a derogation could lead to more demanding or stringent requirements, this apparently goas against the very principle of having derogations. Derogations will allow a Generating Unit not to comply with provisions of the NC, thus the burden is not increased but decreased.
53.0	To delete and merge into 1 article		Disagree - Purely editorial. In the NC a different approach was chosen, which is perfectly feasible. Merging everything into para 1 would overload this para making it confusing and more difficult to read.
53.1	A derogation process should be kept in the NC at least as a last resort solution. It must l be cost-effective as regards its administrative organisation and operation. Especially taking into account the potentially huge number of small facilities/units connected to DSOs network, that could result in a tremendous amount of bureaucratic work with small if any added value.	partially agree	This is to be covered by the implementation of Art 52(4) which states "Criteria for assessing the request for derogation shall be set by the relevant National Regulatory Authority taking into account recommendation of the Relevant Network Operator in coordination with the Relevant TSO. The criteria set by the Relevant National Regulatory Authority shall be non-discriminatory, objective and shall be published by the National Regulatory Authority." This code sets forth the basic principles of the derogation process. How to deal with the hinted possibility that a vast number of applications may follow is not dealt with in this code.

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53.1	The procedure for derogation defined in this Title applies to all Power Generating Facility Operators, ...	disagree	It is a fundamental legal principle that only the Owner and not the Operator is responsible for something (casus sentit dominus). If the Owner transferred all of its rights with the exception of the legal title to the Operator, this is an issue that needs to be dealt with internally. Further, it is doubtful whether under national administrative and/or procedural law a mere Operator would have the right to make a valid application. Having the Owner as the one who can apply simplifies the whole process doing away with the necessity to check whether the Operator actually has the right to make a valid application.
53.2	Additional time designations are needed, if restriction is limited	agree	Wording is alligned with Art. 29(3). However, no explicit reference should be made to a time limit. Article 53(2) and (4) have been amended accordingly.
53.2	In case several power plants of the same type are concerned by a request of application of the requirements of the code the process should be bundeled as far as possibkle with regard to non-discrimination and equal treatment.	partially agree	What the comments actually aim at seems to be Art. 52 para 1 according to which there can only be applications by a Power Generating Facility Owner for an individual Generating Unit. Only Network Operators can apply for derogations for classes of both existing and new Generating Units. Granting the Owners of Power Generating Facilities the right not to apply for derogations for individual Generating Units but for several identical units seems reasonable but it is a technical question, whether "the type of generating unit" is the only criterion upon which a derogation process can reasonably be based. For the avoidance of doubt Article 52(1) is amended by "Only the Power Generating Facility Owner shall have the right to apply for derogations for Power Generating Modules within its facility."
54.2	The Decision process has to be optimized. Decision times of 1 month are too short.	agree	Article 54 has been modified in order to better take this concern into account.
54.7	To grant a transition period in the event of rejection for court proceedings or to comply with requirements NC	disagree	At first glance, this once again is a question of national law, in this case of national administrative law. There, the question whether an appeal or the commencement of court proceedings do have a suspensive effect is answered. As specified in FAQ 15, NC RfG in case a dispute regarding the application of NC provision arises, it shall be referred to national courts - which are the ordinary courts in matters of European Union law - in accordance with national rules. Therefore, no dispute resolution provisions are provided in the NC RfG as such.

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54.7	The requirements at EU level in terms of derogations shall be more generic.	disagree	There is no advantage recognized from this statement. In contrary, a well prescribed derogation process with responsibilities and timelines for the involved parties provides the clarification as requested by other stakeholders. A justification for requesting more generic requirements is not given.
54.7	3 months for the processing of a request for derogation by the National Regulatory Authority is too long	disagree	The decision making process of the NRAs may include stakeholder involvement, studies, etc... Hence 3 months are considered appropriate.
54.9	Agency to publish monitoring results including all granted derogations	disagree	The NRAs have to maintain registers of all derogations granted or rejected. The registers are communicated to ACER. It is a question of national law whether the registers can be published. However, as the decisions and their motivations may contain confidential information, this might not be the case.
54.11	Revoking Decisions shall only be possible in the case of a well-founded reason.	agree	This is a question of national administrative law. The clause is amended by "under the conditions and pursuant to the provisions of national law reserving the vested interests of the concerned grid users, in the cases where the prerequisites for granting the derogation no longer exist for reasons attributable to the concerned grid users"
55.1	In contradiction to art. 3 sub 1 concerning new generating units.	disagree	Art. 3(2) actually provides that Existing Power Generating Modules that are significant are subject to the NC, but only if a dedicated process is run through. This Article is in line with the FWGL which states "the NC may provide that derogation from all or some of the minimum standards and requirements may be granted to classes of pre-existing (and, in exceptional cases, new) significant grid users ....".
55.1	RNO has duty to inform owner of existing generators of a decision to be compliant with NC.	agree	This is already covered in Art 33(6) of the final Network Code which requires publication of such decisions and amendment of contracts.
55.1	limitation to Type D units	disagree	All Types of Power Generating Modules have to be apply for a derogation if they are not compliant. No clear argumentation is given for this proposal.
55.1	Amendment of the clause with "After apply for derogation the application should be followed by a description of which parts are not compliant."	disagree	Comment not clear. This is considered covered by the derogation process itself.
55.2	Network operator has no right to refuse operation of GU. Art. 6 of Reg. 714 does not provide for such right.	disagree	The NC will, most likely, enter into force as a Europeanrregulation. Thus, it is applicable in all member states and becomes binding law in all member states. The sanction of refusing the operation of a PGM if it does not apply for a derogation is not considered disproportionate.

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55.2	Existing GUs should be managed within the Code via grandfathering arrangements rather than derogations.	disagree	The FWGL explicity provides for derogations for pre-existing users. The FWGL does not provide for the grand-fathering of pre-existing units, i.e. the non-applicability of the NC to pre-existing units as they were constructed, built and commissioned under a different, less oneruous legal regime.
55.2	Limitation to Type B and above units, or even to C/D units.	disagree	The Network Operator shall be able to enforce derogations for all types of generators (non-discrimination).
55.2	Delete paragraph 2.	disagree	No justification is given.

ARTICLE 57 – ENTRY INTO FORCE

Issue	**Amendments of the Network Code**
Section	Art. 56 para 1
Proposal	With reference to Art. 7 of regulation 714/2009 some propose that the European Commission should review the NC on a regular basis and no later than 5 or event 3 years after entry into force.
Evaluation	Disagree
Justification	Regulation (EC) 714/2009 is binding on all member states. Article 7 of the regulation contains provisions on amendments to network codes. The proposed revision of the NC by the EC is not foreseen in Article 7 of the regulation. Thus, including such a provision would imply going beyond the Regulation (EC) 714/2009 and would mean imposing an obligation on the EC. This is beyond ENTSO-E's mandate. It is arguable, whether such a provision would indeed improve the generators' situation. Article 7 of the regulation provides for interested persons being able to propose amendments. Thus, generators and manufacturers can submit proposals, which ultimately will be forwarded by the Agency to the EC. Most likely, this is a more flexible approach than the proposed insertion of a revision clause in the NC. With regards to the proposal to set forth the revision procedure in the NC it has to be noted that this would simply mean repeating Article 7 of the regulation. ENTSO-E cannot introduce any other revision procedure in this code. Further, it should be noted that ACER expressed its intention to regulate the revision procedure for NCs as this is an overarching issue concerning all NCs. Such an isolated treatment in this NC is not possible.

Issue	**Transition period**
Section	Article 57
Proposal received	Need to have a general provision that there is a 18 months transition period (2 years for manufacturers) for updating national codes as from the moment the network code is published
Evaluation	Disagree
Justification	Article 57 already provides for a three year period between the entry into force of the NC RfG and its application.

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