

WORKSHOP WITH STAKEHOLDERS ON THE CONNECTION NETWORK CODES NATIONAL IMPLEMENTATION GUIDANCE DOCUMENTS



Outcomes of all groups discussions

29 February 2016

Note

The slides below represent the feedback received by ENTSO-E during the working sessions of the workshop on CNC implementation guidance documents' content. The participants worked in 5 groups and tackled 20 IGD topics (see the next slide)

ENTSO-E will look closely to the received feedback when drafting the implementation guidance documents which are expected to be put forward for one month public consultation in June 2016.

Group topics	Topics
1	<ul style="list-style-type: none"> Rate-of-change-of-frequency withstand capability - Frequency related parameters for non-exhaustive requirements - Need for Synthetic Inertia for frequency regulation - Interactions between HVDC controllers -
2	<ul style="list-style-type: none"> General guidance on parameters for non-exhaustive requirements - Determination of the thresholds for Types B, C & D power generating modules - Guidance on making non-mandatory requirements at European level mandatory at national level Special issues for Type A -
3	<ul style="list-style-type: none"> Voltage related parameters for non-exhaustive requirements - Reactive power requirement for PPMs & HVDC converters at low / zero active power - Reactive power on TSO-DSO interface - Voltage stability in a converter dominated system
4	<ul style="list-style-type: none"> Post fault active power recovery - System restoration requirements - Fault current contribution from PPMs & HVDC converters - Real time data & communications including redundancy.
5	<ul style="list-style-type: none"> Harmonisation Guidance on compliance, test and monitoring - General guidance on CBAs - Instruments, simulation, models & protection for non-exhaustive requirements -

Group 1

Rate-of-change-of-frequency withstand capability (ROCOF)

Is suggested to contain the following:

Scope

- application,
- who defines it,
- coordination

Clear definition of ROCOF (robustness, trajectories) and how to measure it (df/dt, freq filtering, rolling window..). Loss of mains protection scheme definition in the case of RfG

State of art: References, ongoing studies

Reference scenarios and disturbances for df/dt design

Technology performance differences

Machine protection and system protection

Direct link to synthetic inertia rqm

Coordination between TSOs of a S.A.

Interaction with other NCs (Operation)

Frequency related parameters

Is suggested to contain the following:

Scope

- application,
- who defines it,
- coordination

Measurement

Relation with existing stds

Risks associated to increase rqms

Coordination between TSOs of a S.A.

Risk analysis of decreasing P output with falling f (technical capabilities, dynamics)

Technology specifics

Specify in depth LFSM and its dynamics

Island detection method in case of islanded operation

Group 1

Need for Synthetic Inertia for frequency regulation

Is suggested to contain the following:

Scope

- application,
- who defines it,
- coordination

Description of the phenomena and the necessary stages: input signal (measurement) → control → actuator

Issues with P available / stored energy

Link to ROCOF reqm (not the only input to be considered in the above stages)

Technical limitations

Level of performance (thresholds depending on situation/scenario, technology)

Control Interactions (HVDC)

Is suggested to contain the following:

Scope

- application,
- who defines it,
- coordination

Role play in HVDC project

Definition and classification of interactions (active control or preventive)

Studies run by 3rd parties – Models (NDAs) – responsible body

Best practices references to guide on technology specifics

Group 2

General guidance on parameters for non-exhaustive requirements

Is suggested to contain the following:

List of Non-Exhaustive (NE) parameters

Co-ordination Vs Harmonisation – What is the overriding goal

Ranges why do we have them in the Codes

Process of justification of NE parameters

- Include options/alternatives for NE
- Respect for standards – relationship with network code
- Include Driver/Impact assessment of options
- Driver/Impact to include technical, toehr Network Codes, and stakeholder

Stakeholder Group relationship to defining NE requirements and their influence

Categorise NE parameters (Frequency/Voltage/etc) and define for each how widely they need to be co-ordinated and with whom

Determination of the thresholds for Types B, C & D power generating modules

Is suggested to contain the following:

Explain how the recognition of the characteristics and capabilities of the Synchronous and PPMs should be included in decision

Explain how future generation portfolios should be included in the decision making process

- System requirements need to be assessed against operating cost of the generator

Process to define NE parameters, Mandatory/Non-Mandatory and thresholds are defined – probably iteratively

- Should include how European co-ordination is achieved
- Should account for both stability for investment and system risks – this includes both technological and cost - if we develop new plant and equipment now how long a certainty is there before it is revised

Include a table of type B, C and D linkage to the parameters in the requirements, should include explanation of how they are linked and interlinked

Group 2

General guidance making non-mandatory European Requirements Mandatory

Is suggested to contain the following:

What is the difference between non-exhaustive and non-mandatory requirements

List non-mandatory requirements in the code

Categorise non-mandatory requirements

- Commerically available (Mature or not)
- Enforced day 1 of code/Future time bound
- Project specific/General applied

Method for justification to be provided

- Utilise standards where available as default starting position
- Alternatives should be considered

Guide to provide process implementation timeline

- Method for public consultation with stakeholders

Change to mandatory from non-mandatory needs to be explain what happens to existing [RfG/DCC/HVDC definition] users

Special Issues for Type A Generators

Is suggested to contain the following:

Recommendation to prioritise Type A LFSSM - O/F parameters

- Consideration of local protection requirements
- Co-ordinate choice across synchronous system

How to deal with mis-match between standards/Type A requirements locally

Guide should consider how to make/appraise test for equipment and national compliance tests

Guide to include available standards and those not in existence and what to do when none exist

Country A (prod), country B(installed), County C(CERTIFIED)

Group 3

General guidance on parameters related to voltage issues

Is suggested to contain the following:

- Degrees of freedom (if any)
- Definition of dynamic and steady-state operation
- Automatic disconnection, is disconnection required or allowed?
- Coordination between neighbouring TSO/DSO

Reactive power requirement for PPMs and HVDC at low/zero power

Is suggested to contain the following:

- Management of reactive power availability/source under different operating conditions
- Cost
 - Lowest societal cost
 - Cost of asset replication (PPMs/HVDC unavailable)
 - Cost extended capabilities
- Scenarios
 - required/utilized capabilities
 - avoiding retrofitting
 - share of synchronous generation will decrease
 - time frame 10-20 yr and 20+ yr
- Requirements of case by case basis or by general requirement
- Examples of current network codes

Group 3

Reactive power management at T-D interface

Is suggested to contain the following:

- **Describe existing requirements**
 - Where do we come from
 - Explain reasons for different approaches
- **How to define new requirements**
 - CBA on local vs central q resources
 - Joint analysis, define framework
- **Technical integration**
 - difference between requirement and operation
 - “Smart Grid” to get generator like performance at TSO/DSO interface
- **First results**

Voltage stability in a converter dominated system

Is suggested to contain the following:

- **Analysis of the problem / characteristics of the problem**
- **Determine if TSO is affected**
 - Normal operation
 - System split
- **First functional requirements**
- **It might be partial knowledge**

Group 4

POST FAULT ACTIVE POWER RECOVERY

Is suggested to contain the following:

- Justification of why is this requirement needed
- Depending on the nature of the electrical network (penetration level of PE, decentralized generation..), establish examples on how the requirement should be implemented
- Give recommendation on required power magnitudes, time frames, accuracy, etc..

SYSTEM RESTORATION REQUIREMENTS

Is suggested to contain the following:

- It is a topic mainly important for the TSO
- Give an advice of which of the system restoration requirements should be mandatory in the future (especially black-start capability)

Group 4

FAULT CURRENT CONTRIBUTION FOR PPMs AND HVDC

Is suggested to contain the following:

- Justification of why is this requirement needed
- Give recommendation on required time delays, current levels and accuracy of the fast fault current injection
- Explain possible challenges related to correct operation of protection systems (short circuit contribution, multi-directional flows in LV networks)

REAL TIME DATA&COMMUNICATIONS INCLUDING REDUNDANCY

Is suggested to contain the following:

- Distinguish between three different categories of information flows:
 - TSO – DSO
 - DSO - DSO (second and third level DSOs)
 - TSO - Generation
 - DSO – Generation
- Establish which data is necessary for each category (power flows, topology of the network, actual power, resource planning data, etc...)

(Hot topic in Germany. Seen as a key issue)

Define the purpose of the data

TRANSVERSAL COMMENTS FOR ALL IGDs:

- State the normal practices in other countries
- Give an advice of what can be expected in the future for non-exhaustive requirements

Group 5

Harmonisation:

Is suggested to contain the following:

Scope

- Application
- Legal basis
- Limits of harmonisation

Drivers

- Why?
- Link to target model
- Aims

(ENCs are the beginning)

Interpretation

Sharing

- ENTSO-E and TSO involvement
- Best practice

Compliance:

Is suggested to contain the following:

3 areas

- Operational notification process
- Compliance monitoring
- Compliance testing

Introduction

Scope

New equipment? Existing? Modifications?

Derogation process

Process

Who carries it out?

What are the tests?

Standardisation

Group 5

CBA -Is suggested to contain the following:

Who does a CBA?

- Independent body
- Look at existing European CBA process

Scope of CBA

- Timeframe: how long are decisions made for?
- Clear universal criteria
- Assessment method to establish
- Distinction between parties carrying out - TSO, DSO
- Type of CBA - may determine scope/depth

Methodology

- Guidance on quality, quantitative/qualitative analysis, impact screening, cost to consumers

Obligations to provide information

- All parties need to have similar obligates to take part

Validation

- Via consultation
- Subject to NRA

Outcomes

- Interpretation of outcome and justification for proposal
- Feeds in to NRA decision...and note cross border concerns

Instruments, simulation, models and protection for non-exhaustive requirements -Is suggested to contain the following:

[Define what these are!]

Scope - and links to other areas of code

- When to use models/simulations, when to use test results
- Modelling at small/domestic levels

Who needs to do this?

Requirements

- Criteria
- Site-specific issues

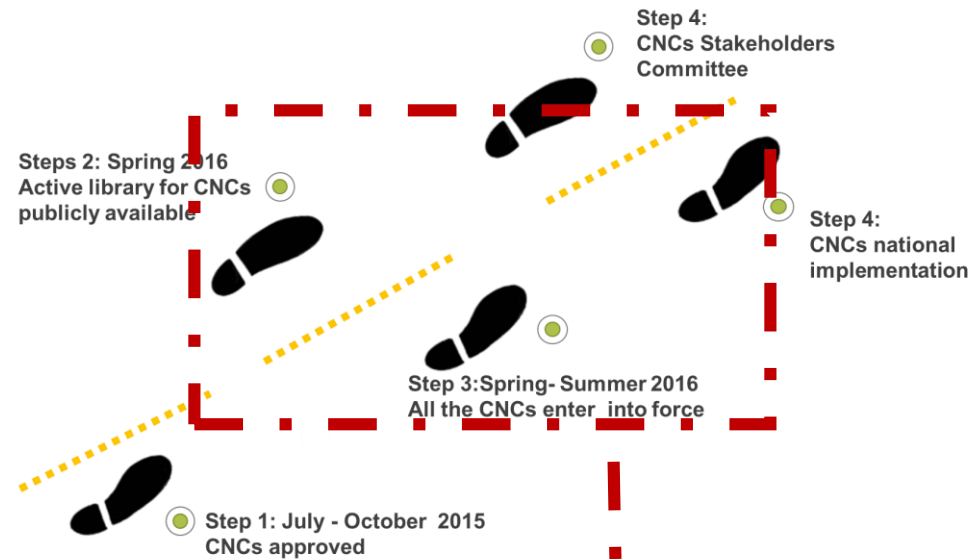
Standardisation

- Across member states
- Single model?
- Common understanding of requirements/models
- European certification
- Single protection standard

Validation

- Mandatory if using models in simulations
- Process to set out
- Validate by TSO - but subject to NRA appeal

CNCs implementation – overview of the next step



Dec '15-Jan '16
Survey on the
guidances' topics

29 Feb '16
'Define the
content of each
guidance
document

Mar - June '16
Draft the guidances

June - July '16
Consultation of
the
implementation
guidances

Sept '16
Publication of
the final
implementation
guidances