RfG User Group meeting

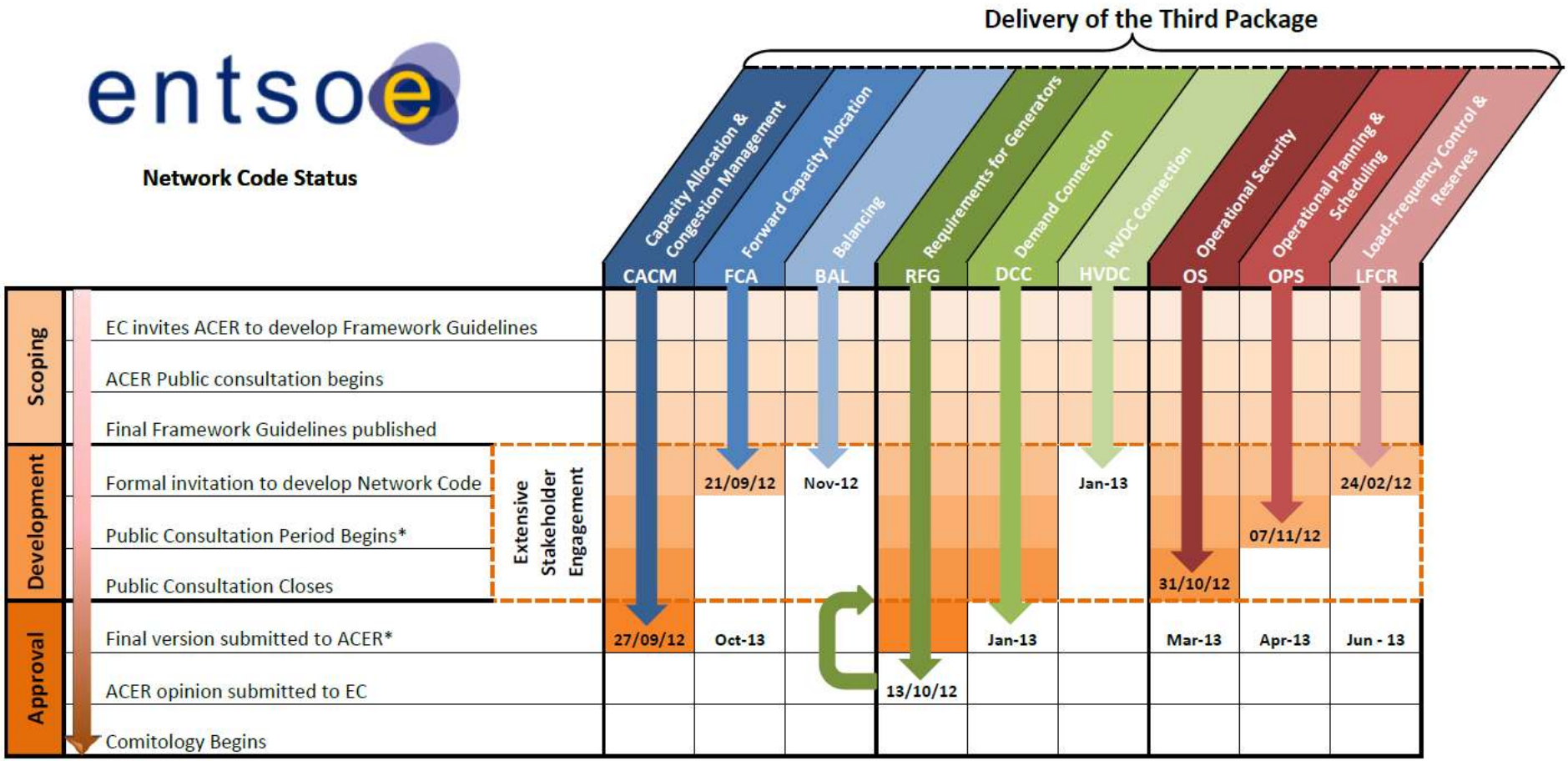
22 November 2012

9h30 – 13h00CET

entsoe

Reliable Sustainable Connected

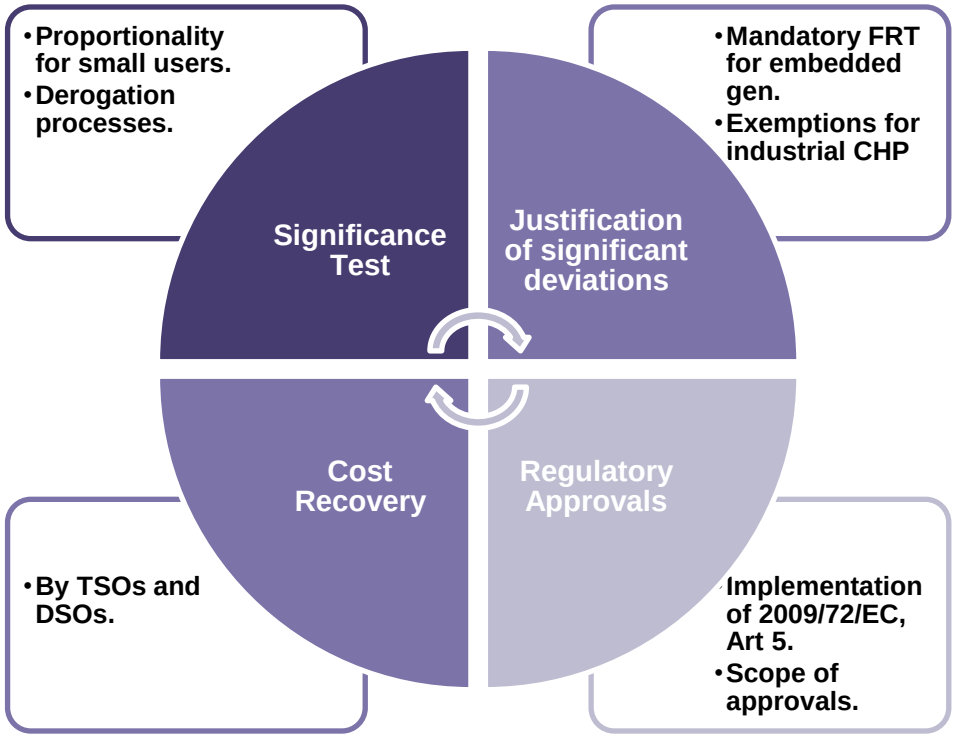
Network Code overall status



Latest information on Network Codes Status is available on the ENTSO-E website, here

Meeting objective

Goal: Capturing the view of all relevant stakeholders on how to address the four areas in ACER's Opinion and identify a way forward considering timing and appropriate further involvement of all relevant actors.



Meeting participants

CEDEC - EDSO for Smartgrids - Eurelectric DSO - Geode
COGEN Europe
EHI
EPIA
EUR
Eurelectric WG Thermal / VGB Powertech
EUROMOT
EUTurbines
EWEA
IFIEC Europe

ACER/NRAs
EC
CENELEC
ENTSO-E

Agenda

ACER/NRA overview of Opinion on NC RfG (13 October 2012)

EC view on the process

Round-table of all participants regarding the four areas addressed for improvement

First proposals on the next steps

Summary – Next steps

Agenda

ACER/NRA overview of Opinion on NC RfG (13 October 2012)

EC view on the process

Round-table of all participants regarding the four areas addressed for improvement

First proposals on the next steps

Summary – Next steps

Agenda

ACER/NRA overview of Opinion on NC RfG (13 October 2012)

EC view on the process

Round-table of all participants regarding the four areas addressed for improvement

First proposals on the next steps

Summary – Next steps

Agenda

ACER/NRA overview of Opinion on NC RfG (13 October 2012)

EC view on the process

Round-table of all participants regarding the four areas addressed for improvement

First proposals on the next steps

Summary – Next steps

Expectations of next steps regarding the four areas in ACER's Opinion on NC RfG

CEDEC - EDSO for Smartgrids - Eurelectric DSO - Geode
COGEN Europe
EHI
EPIA
EUR
Eurelectric WG Thermal / VGB Powertech
EUROMOT
EUTurbines
EWEA
IFIEC Europe

Agenda

ACER/NRA overview of Opinion on NC RfG (13 October 2012)

EC view on the process

Round-table of all participants regarding the four areas addressed for improvement

First proposals on the next steps

Summary– Next steps

Significance test to identify “significant grid users”

ACER Opinion positively acknowledges

- Technology-neutral approach / importance of uniform application;
- Differentiation depending on size

ACER Opinion questions for type A PGMs

- Link between material penetration of small units and aggregated impact;
- Potential barriers for new small-scale technologies supporting energy/climate targets

ACER Opinion suggests for type A PGMs either

- Enhancement of criteria in the significance test, based on aggregated impact;
- Enhancement of the derogation process, open to equipment manufacturers for consideration at a coordinated pan-European level;
- Other options?

Significance test to identify “significant grid users”

Enhancement of criteria in the significance test, based on aggregated impact

- Link to aggregated impact requires necessarily a link to technology or even manufacturer-specific characteristics.
- Every exemption of X MW in frequency withstand capability results in increased need for reserves with costs socialized over all users.
- What would be a reasonable threshold for aggregated capacity? What happens if it is exceeded (retrofit?)
- What is the difference between a significance test at national level, with detailed cost implications and technology-specific criteria, and a derogation process for which also transparent criteria are to be set?

Enhancement of the derogation process, open to equipment manufacturers for consideration at a coordinated pan-European level

- Appropriate process to cover justified, technology-specific exemptions
- Transparency in request (e.g. publication, motivation)
- Transparency across Europe (e.g. criteria set by NRA, consulted with ACER)

Justification of significant deviations

- Exhaustive & Non-exhaustive requirements
- Balance between specification/justification at European or Member State level
- ACER Opinion suggests that further analysis is restricted to
  - Voltage related issues at distribution level, i.c. mandatory nature of FRT for type B units (Art 9(3)a) and reasonable alternatives
  - CHPs: Industrial processes with tightly coupled heat production (Art 3(6)h)

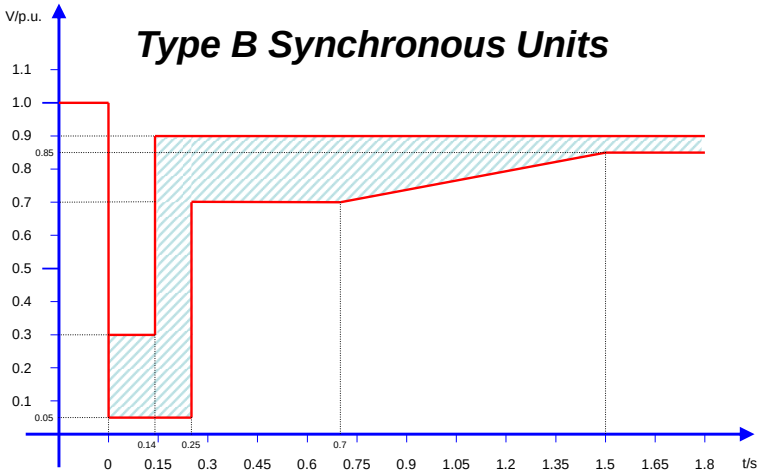
Fault Ride Through Capability

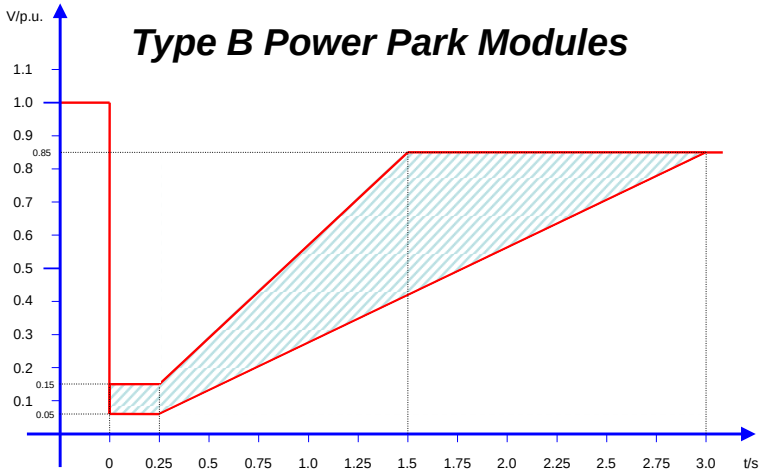
Generating Units should remain stable and connected to the network when faults occur on the ***TRANSMISSION NETWORK***, in particular in order to avoid frequency instability.

It is an emerging requirement, in particular for TSOs with a high penetration of distributed generation

Aim and Justification of the FRT-Requirement for Type B Units

- The *FRT-Requirement is based on a V(t)- profile at the CP*, which reflects the worst voltage variation during a fault and after its clearance which is to be withstood.
- PGMs have to *stay connected to the grid for voltages above these worst-case conditions* and shall continue stable operation after a secured fault on the network.
- Due to the *limited impact of failures at the distribution levels on power system security*, both Synchronous PGM and PPMs have to fulfil *less stringent requirements* during the voltage drop. They have to withstand a voltage drop that results from a fault at the Transmission voltage level.
- *Different V(t)-profiles* for Synchronous PGM and PPMs are applied in order to make best use of the *different technical capabilities of the generation technologies*.
- The power system is *designed to withstand a maximum sudden loss of generation* after system faults. If PGMs connected to healthy circuits do not remain connected and stable during and after a fault, a considerable amount of generation may be lost even after a secured fault. This results in the *potential* loss of generation connected to healthy circuits with the consequence of losing the maximum designed infeed loss, the impact being the *collapse of system frequency and blackout*.



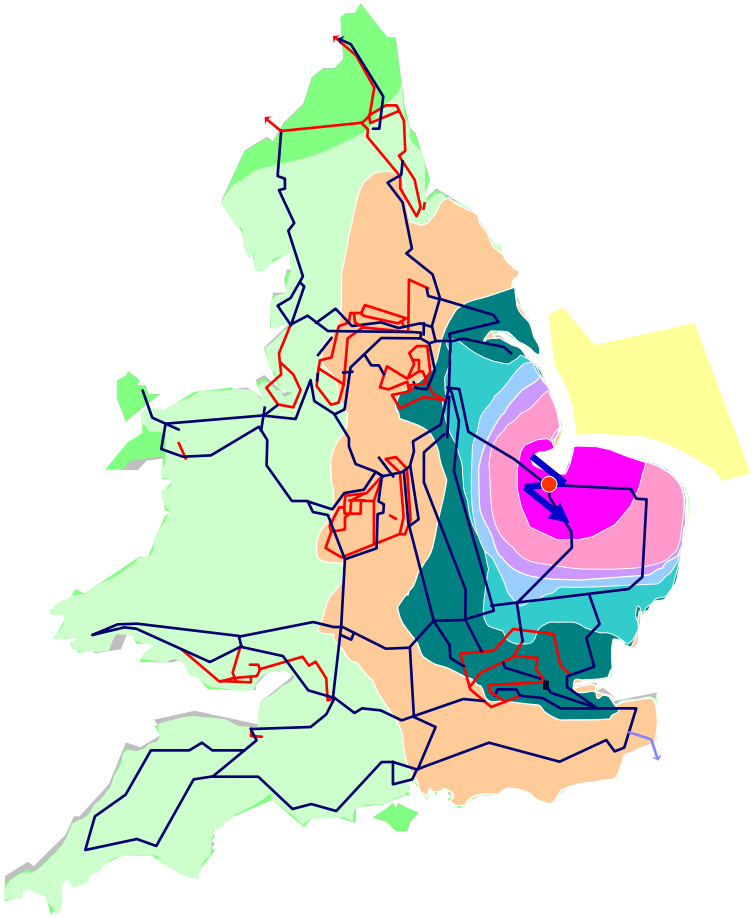


ACER Opinion on mandatory FRT capabilities for type B

Regarding non-exhaustive requirements, whilst the Agency accepts that it is not straightforward to undertake a cost-benefit analysis to justify such requirements, it is still reasonable to expect a justification where a non-exhaustive requirement is applied to a grid user for the first time. For example, for type B power generating modules that currently have no obligation for fault ride through capability, a justification that these users should be mandated to have this new capability should be provided, in line with the respective Framework Guidelines text and regardless of the final set point that is assigned to the requirement at national level.

- The relevance of FRT capability for frequency stability could be better highlighted
- Frequency stability criteria and related requirements are acknowledged
- Justification by means of system studies to illustrate the need and address alternatives
  - Real event studies and simulations presented from various parts of Europe (Great Britain, France, Germany, Spain)
  - To be further discussed in-depth with the DSO TEG

Great Britain:
Voltage Dip Propagation: The Wash

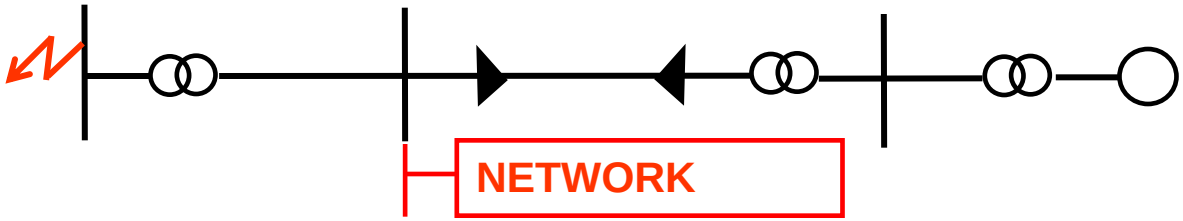


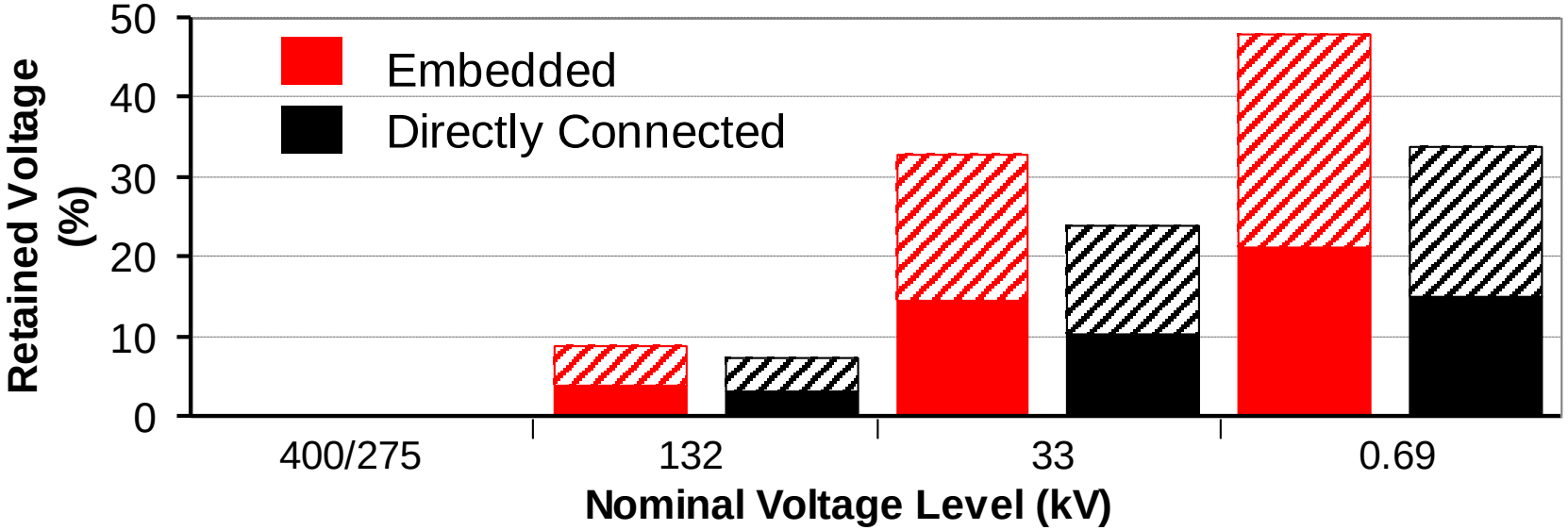
3 phase fault applied at Walpole 400 kV substation

- **Fault Location 0 %**
- **0 - 15 %**
- **15 - 30 %**
- **30 - 40 %**
- **40 - 50 %**
- **50 - 60 %**
- **60 - 70 %**
- **70 - 80 %**
- **80 - 90 %**

<u>Legend:</u> The retained voltage in relation to the pre-fault voltage on Transmission Level

Retained Voltage across the system



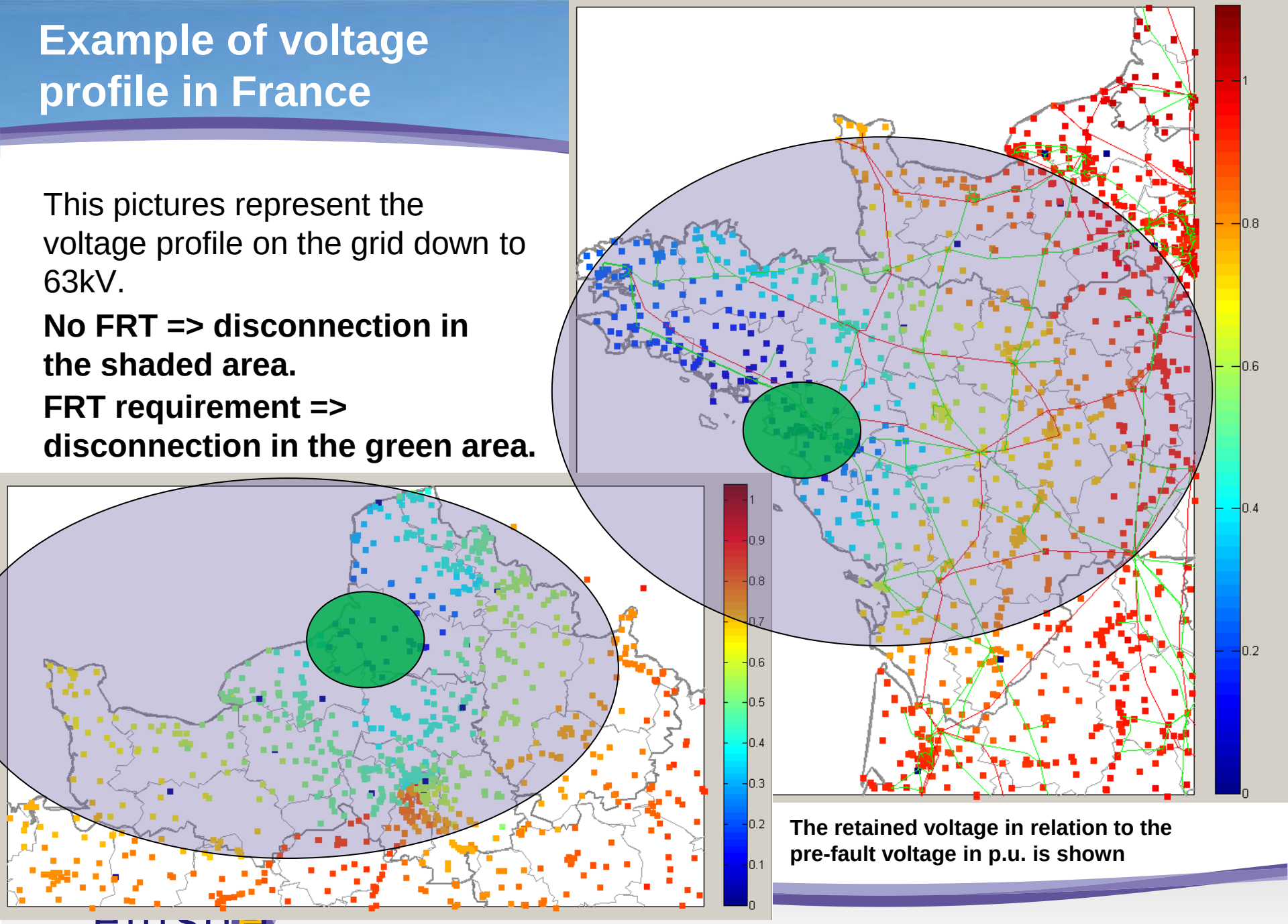


Example of voltage profile in France

This pictures represent the voltage profile on the grid down to 63kV.

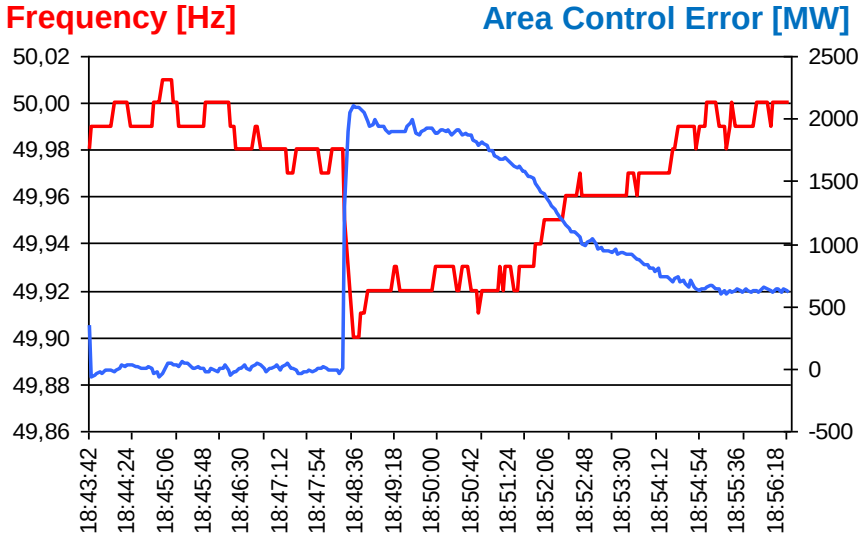
No FRT => disconnection in the shaded area.

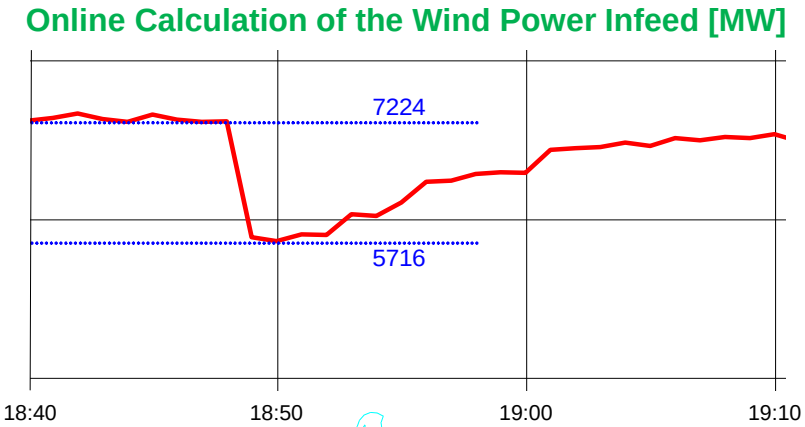
FRT requirement => disconnection in the green area.

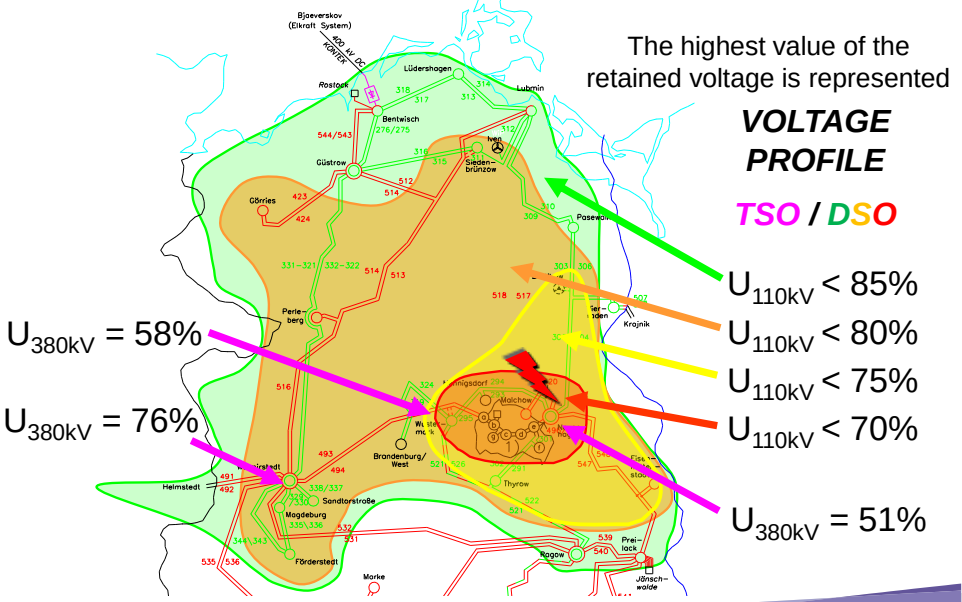


The retained voltage in relation to the pre-fault voltage in p.u. is shown

Fault in Germany nearby 50Hertz-substation Neuenhagen in 2007

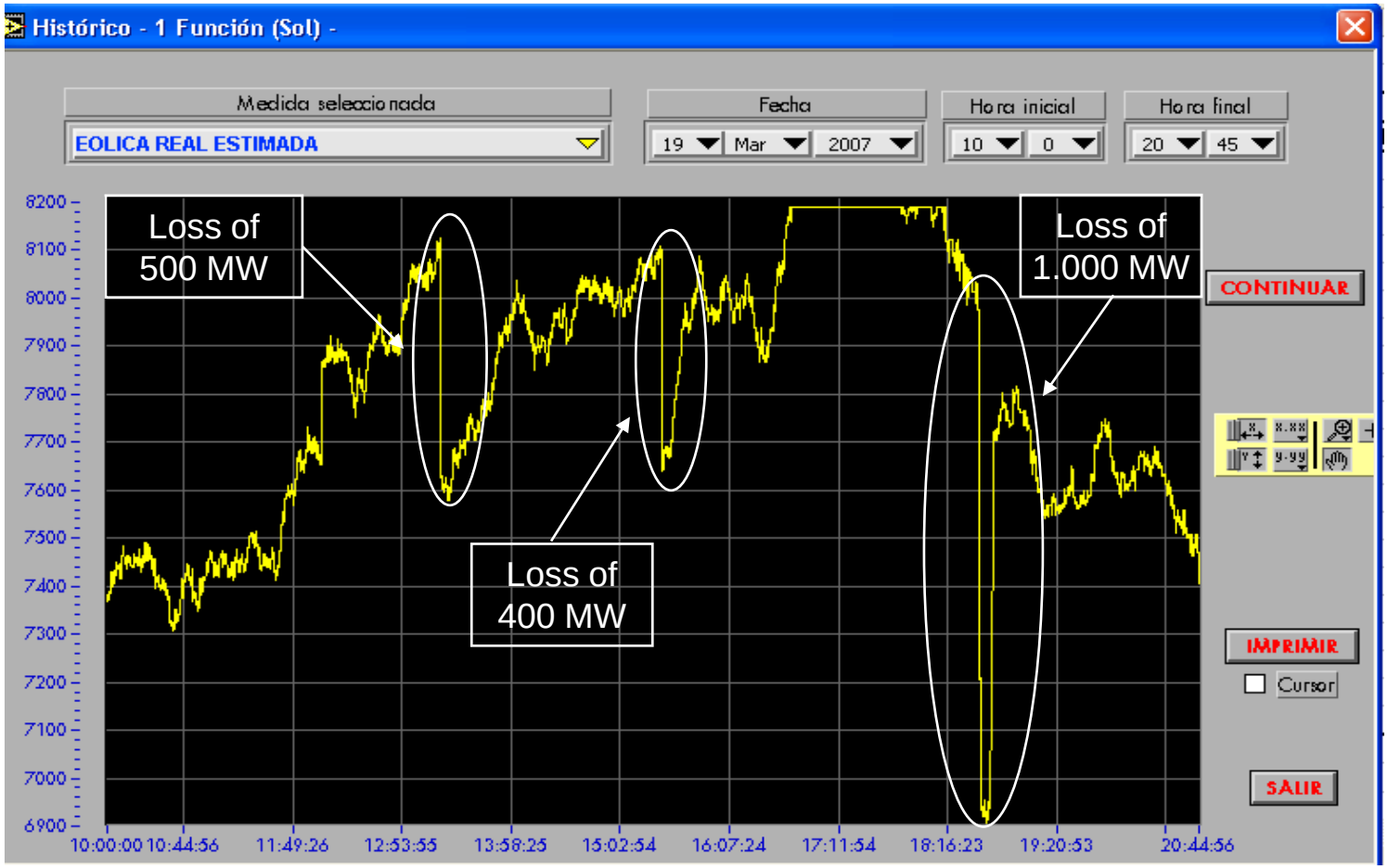






- **Frequency deviation of -100mHz** was triggered by a 2-phase-fault in the transmission network nearby 380-kV-substation Neuenhagen (Berlin Area)
- Fast Fault clearing time approx. 80ms
- Temporary increase of the power import from neighbouring TSOs of approx. 2.000 MW
- The online calculation prediction tool of the wind power infeed refers to an disconnection of approx. 1.500 MW of wind power generation

Loss of Wind Power Generation in Spain due to several Voltage dips on 19/March/2007



FRT for type B units - Summary

- The coherency between faults in the Transmission network and a considerable amount of loss of wind power generation in the distribution networks has been demonstrated by means of
  - Incidents in Germany and Spain as well as
  - Investigations in the EWIS Study & studies for GB and France.
- Distribution system impact
  - Common understanding that there is no need to cover LV faults.
  - Impact of voltage dip propagation to distribution level is demonstrated.
- Case studies demonstrate that the FRT-Requirement for Type B unit is justified in order to maintain frequency stability and system security.
- **ENTSO-E recommendation to maintain the FRT-Requirement in the Network Code as mandatory for all type B units, with further details on settings in line with national practices.**
- Further discussion with DSO TEG ongoing

Industrial processes with tightly coupled heat production

- Proposal to extend Art 3(6)h to rigidly coupled heat production with the same underlying constraints
  - industrial site
  - type A-B-C
  - selected requirements related to Active Power Output control

- Argumentation based on site-specific conditions, need for high quality of heat production

- An exemption cannot apply ex ante to e.g.
  - type D units: fewer cases, higher impact, requiring a specific derogation process
  - district heating: generally a lower need for quality of heat delivery, more inherent heat storage

Regulatory areas

Summary of ongoing interactions with ACER/NRAs

National scrutiny of requirements to be implemented at national level (Art 4(3))

- Need to clarify the **wording / rationale** of Art 4(3) = implementation of provisions in the 3rd Package which will stipulate involvement of NRAs and other parties at national level.
- Need to clarify the **application** of the process Art 4(3) refers to throughout the code. A revised wording of Art 4(3) may lead to more references in the code. For some cases (e.g. site-specific details) another pragmatic process of NRA involvement may be more appropriate.

Recovery of costs incurred by regulated Network Operators (Art 5)

- Discussion ongoing

Agenda

ACER/NRA overview of Opinion on NC RfG (13 October 2012)

EC view on the process

Round-table of all participants regarding the four areas addressed for improvement

First proposals on the next steps

Summary – Next steps