

Network Code Requirements for Generators: DSO View

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EURELECTRIC Network of Experts TSO-DSO Interface

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DSO Technical Expert Group for the RfG

- **Formally set-up on the basis of ENTSO-E invitation letter**
 - 20th European Electricity Regulatory Forum expressed importance of involvement of DSOs in development of network codes
 - ENTSO-E invited DSO associations to appoint technical experts
 - Experts bring in their experience on request of the ENTSO-E DT
 - Minutes of working sessions are published on ENTSO-E website
- **Experiences**
 - Tremendous progress since the first drafts
 - In the final proposal, DSO TEG's views considered in a limited way

Issues Addressed in the DSO Letter Sent to ENTSO-E on 5 June 2012 Remain Valid

- **Allocation of responsibilities among stakeholders**
- **Missing cost-benefit analysis**
- **Determination of Connection Point ('Responsibility gap issue')**
- **Compliance & standardization**

Allocation of Responsibilities Among Stakeholders

- **Alternative technical solutions listed by ENTSO-E in the 'Justification outlines' document are presented in simplistic way & not fully considered in the development of the network code.**
- **Example: Escalation of a local incident to a large scale cross-border one is not only dependent on generating unit's capabilities to support voltage management or fault ride through but also on transmission network performance**
 - **Adequate transmission network development & robust defence strategy are needed**

Results of Survey among European DSOs Demonstrate that Number of NC Requirements Significantly Deviate from Current Practices

	Austria	Belgium	England & Wales	France	Germany	Ireland	Italy	Northern Ireland	Scotland
Frequency ranges	Yellow	Yellow	Red	Red	Yellow	Red	Green	Green	Red
Rate of change of frequency withstand capability	Green	Black	Red	Red	Red	Red	Black	Green	Red
Active Power Controllability and Control Range	Red	Black	Yellow	Black	Green	Yellow	Black	Black	Yellow
Limited Frequency Sensitive Mode (over-frequency)	Yellow	Red	Red	Black	Red	Black	Green	Green	Red
Limited Frequency Sensitive Mode (under-frequency)	Red	Red	Red	Black	Red	Yellow	Black	Black	Red
Frequency sensitive mode	Red	Black	Red	Black	Red	Green	Black	Black	Red
Simulation models	Red	Black	Yellow	Red	Red	Black	Black	Black	Yellow
Black Start Capability	Yellow	Black	Green	Red	Red	Red	Black	Black	Green
Voltage Ranges	Red	Black	Green	Red	Red	Green	Black	Black	Green
Maximum Power Reduction at under-frequency	Yellow	Black	Red	Black	Red	Black	Black	Black	Red
Reactive Power Capability at Maximum Active Power (synch)	Red	Black	Red	Black	Red	Green	Black	Black	Red
Reactive Power Capability below Maximum Active Power (synch)	Green	Black	Red	Black	Yellow	Yellow	Black	Black	Red
Reactive Power Capability at Maximum Active Power (PPM)	Black	Black	Red	Black	Red	Black	Black	Black	Red
Reactive Power Capability below Maximum Active Power (PPM)	Black	Black	Red	Black	Red	Black	Black	Black	Red
Fault-Ride-Trough capability (synch – type B and C)	Black	Yellow	Red	Yellow	Red	Black	Red	Black	Red
Fault-Ride-Trough capability (PPM – type B and C)	Black	Yellow	Red	Black	Red	Black	Green	Black	Red

Requirement not existing in current code, impact unknown	Black
Existing requirement	Green
Minor deviation	Yellow
Major deviation	Red

Cost-Benefit Analysis for requirements deviating from present practices (ACER FG 2.1) is necessary

- The “current practices” described by ENTSO-E accompanying documents do not always correspond to the information provided by the DSO experts
- **Key issues:**
 - Frequency sensitivity requirements and the related LFSM-O and LFSM-U

LFSM-O & -U & Risk of Undesired Islanding

Rule for prevention of electrical risk for personnel in case of incident
= **DISCONNECT!**
Decisive factor for security of supply = **REMAIN CONNECTED!**



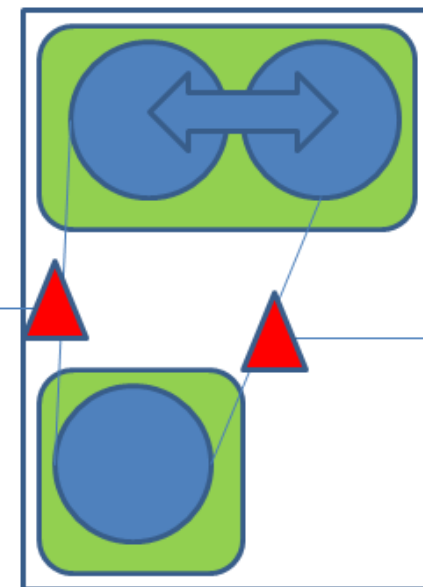
- The NC proposes moderation of protection systems by weakening frequency and voltage based protection settings
- Possible negative consequences:
 - An unacceptable increase of electrical risk in distribution networks in some countries
 - Damages to generators and consumer appliances (under islanding operation)
- The network code should not preclude technical solutions that would ensure the quality and safety of networks operation (currently in a demonstration phase)
 - DSOs offer their contribution to the CBA on this requirement

Determination of Connection Point (‘Responsibility Gap issue’)

Power Generating Facility Owner to be responsible for compliance of the Power Generating Module (Art. 34)

→ PGF behaviour at the connection point is key

- **The network code should be clear on how the connection point is determined to ensure unambiguous definition of requirements**
- **DSO not to be responsible for any difficulties arising between the generating PGM & the connection point**



1 Facility
3 Units
2 Connection points

Compliance & standardization issue: Type Testing necessary for compliance monitoring of Type A generators (mass market)

'The Relevant Network Operator shall regularly assess the compliance of a Generating Unit with the requirements under this Network Code...' (Art. 35(1))

➔ Not viable for DSOs; CBA would be clearly negative ➔ 3 compliance options:



CE Marking – Impossible without standards
- Only safety & hazards for LV equipment covered, system performances not yet!

➤ Standards gap to be identified and timeline for their development considered



Self-certification

➤ No guarantee from PGF operator in case of failure



Test laboratories & certification bodies accredited by national affiliate of European cooperation for Accreditation (EA)

➤ To be published at EU level



Compliance & standardization (ctnd)

ENTSO-E proposal of third party certification only partly addresses the issue

- Clearly defined test procedure is missing
- Risk of unenforceability of requirements without proper standards describing test procedure in place
- Risk of complications in implementation including legal disputes & widespread use of derogations
- Possibility of using a so-called 'New approach' (EU regulation defining requirements to be filed out by standards defined by CENELEC) should be investigated (see example of Machinery Directive 2006/42/EC)

Recommendations

- **A full-fledged independent Cost-Benefit Analysis for deviating requirements is necessary**
- **The open issues including unresolved legal issues should be addressed in an open discussion with relevant stakeholders...extra time is needed for this**

Thank You For Your Attention!

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