Update on Expert Groups On-going and planned activities

ENTSO-E

8th Grid Connection European Stakeholder Committee Meeting

14 December 2017, Brussels

Expert Groups

- High Penetration
- Cost Benefit Analysis
- Compliance Monitoring

EG on high penetration 1/4

- Total 12 members

- Stakeholder groups represented in EG:
  Wind manufacturing industry (4), HVDC manufacturing industry (2), PV inverter manufacturing industry (1), power system analysis tool providers (1), academia (2), system operators (2)

- Phase 1 from December 2016 until end of January 2017 (finished):
  Substantially reviewed existing IGD on “Fast Fault Current Contribution”
  Created first version of IGD on “High penetration of Power Electronics interfaced Power Sources” (HPoPEiPS)

- Phase 2 from March 2017:
  Further improve “holistic approach” of IGD on High penetration of Power Electronics interfaced Power Sources”
  Deriving “grid forming” performance criteria for benchmarking and testing
  Achievable performance for individual features for either no, low or substantial additional cost
  Release updated version of IGD on HPoPEIPS end of 2017

EG on high penetration 2/4

Phase two so far

- Focus on high penetration
- Road from 50 to 100% instantaneous PEIPS
- Needs – so far built on content in IGD HPoPEIPS
- Initial focus – how could 6 future performance needs be met – specified?
  - What could be achieved in each performance area at low, medium or high additional cost respectively
  - The 6 converter performance improvement areas with 6 teams of two reps to take forward:
  - T1: Helge & Stephan; “Create system voltage”
  - T2: Peter & Klaus; “Contribute to fault level”
  - T3: Jörg & Sönke; “Sink for harmonics & unbalances”
  - T4: Thyge & Andrew; “Contribute to inertia”
  - T5: Jens & Thorsten; “First cycle survival/emergency support”
  - T6: Bertil & Bernd; “Prevent adverse controller interactions”

Most of these topics have 2/3 subheadings to define them further

EG on high penetration 3/4

Phase two revised

- Preparatory work for input on HP to a future Issue 2 of CNCs
- How can 6 groups of future needs be met – specified?
  - What could be achieved in each performance area at
    - Low cost
    - Medium cost
    - High cost
- Related activity elsewhere includes:
  - GB consultation
    - GB expert group to be established early 2018 – maybe link to / collaboration with ENTSO-E EG
    - Complimented by hardware in the loop R&D to review previous HP R&D conclusions
  - MIGRATE R&D – widespread work – including cover of issues for larger SA such as CE.
    - Hardware in the loop R&D hosted by RTE.

EG will possibly run some further content assessment and organisation changes at the beginning of next year which will also help to realign the members to common objectives and impactful content.

EG on high penetration 4/4

- Continuous webinars (on usually three-weekly basis), participation of members typically 60%
  - *Next webinar 11 December, then 15 Jan and 5 Feb*
- *Physical meeting planned for March*

EG on Cost Benefit Analysis 1/2

- Total 18 members

- Stakeholder groups represented in EG:
  manufacturers and generation (8), regulators (1), system operators (4), industrial consumers (1), storage (1), network operators (3)

- Kick-off: 18/05/2017
- Timing: 6 months
- Target: To further develop the IGD on cost benefit analysis to meet reasonable stakeholder expectations

Schedule:

Date	Time (always CET)	Format/Location	Purpose
28 Nov	10-12	Webex	IGD has been finalized, ToRs have been fulfilled, ENTSO-E approval process has been started
9 Mar	10-12	Webex	Tentative meeting to reply to comments received during the consultation process

EG on Cost Benefit Analysis 2/2

Structure

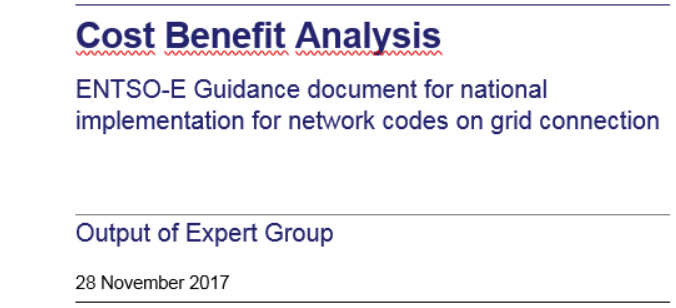
Scope – essentially this draws out where in the Network Codes a CBA is required and making distinctions between the different cases (derogations and retrospective CBAs). This is similar to the 1st ENTSO-E draft.

Methodology – this sets out the basics/principals of the process i.e. general schematic of the process, a study framework definition etc.

Specific cases – covering in more detail the different applications of a CBA.

Data Provision and Confidentiality obligations

Examples – referencing the material submitted


Cost Benefit Analysis

ENTSO-E Guidance document for national implementation for network codes on grid connection

Output of Expert Group

28 November 2017

EG on compliance monitoring

- Total ≈ 25 experts from 22 companies
- Stakeholder groups represented in EG: Turbine manufacturing industry, wind manufacturing industry, co-generation industry, engineering and certification bodies, utility companies, energy suppliers, DSO association, consultant companies, standardization entities,…
- Next steps:
  - *Invitation to CENELEC to discuss options for coordination/collaboration on compliance monitoring – first invitation was sent mid-October, second early December (ongoing)*
  - Explore (Survey?) at CNC level how technical requirements will be checked by each TSO/DSO/country once CNC apply
  - Assessment on the need for harmonization on compliance testing and simulation

Public Workshops

- **3rd Public Workshop on Freq. Stability Parameters – 4th Oct 2017**

3nd Public Workshop on Freq. Stab. Parameters

- October 4th in Brussels – Invitation sent

- 38 participants (present and web-connected)
  - 20 non-TSOs

- The workshop focused on:
  - Demand Response System Frequency Control (DR SFC)
  - Frequency ranges of automatic connection and gradient of active power increase
  - Auto reconnection after an incidental disconnection
  - Admissible active power reduction at low frequencies.

Agenda and more information are announced here

Frequency stability parameters

On-going public consultation – Agenda item 6

8 IGDs prepared and submitted for consultation

New

- **Frequency Sensitive Mode**
  - RfG, Article 15(2)(d)
  - RfG, Article 15(2)(e)
- **Limited Frequency Sensitive Mode**
  - RfG – Article 13(2)
  - RfG – Article 15(2)(c)
- **Demand Response – System Frequency Control**
  - DCC – Article 29(2)
- **Frequency Ranges**
  - RfG - Article 13 and Article16(2)(a)
  - DCC - Article 12
  - HVDC - Article 11 and Article 39(2)(a)
- **Maximum Admissible active power reduction at low frequencies**
  - RfG Article 13(4) & (5)
- **Automatic (re-)connection and rate of change of active power**
  - RfG Articles 13(7) and 14(4)

Update

- **Rate-of-change-of-frequency withstand capability (RoCoF)**
  - RfG - Articles 13(1)(b) and 15(5)(b)(iii)
  - DCC - Articles 28(2)(k) and 29(2)(g)
  - HVDC - Articles 12 and 39(3)
- **Need for synthetic inertia for frequency regulation**
  - RfG - Article 21(2)(a)
  - DCC – Article 30(1)
  - HVDC - Article 14(1)

Roadmap to completion

Synthesis of the initial context considered for the guidance (long term visions, input from stakeholders, …)

09/03/2017 -1st Public workshop on frequency stability requirements

⇒ *see next chart for details*

Action plan for stakeholder involvement to be derived from workshop outcomes:

- Format of further interaction
- Scope and timing of delivery stakeholder opinions/input for providing guidance on implementation

ENTSO-E elaboration of guidance for ranges and values regarding frequency stability requirements impacting plant design and standard elaboration

ENTSO-E elaboration of a first set of guidance for operational values to be used during the operational notification procedure (e.g. default settings of parameters)

July 2017- 2nd Public workshop on frequency stability requirements per synchronous area

July 2017- ENTSO-E proposals and views for non-exhaustive parameters for frequency stability parameters to be available

04/10/2017 3rd Public Workshop on remaining frequency stability parameters

Finalisation of the relevant IGDs and internal evaluation

The week of 20th November – Kick off the public consultation of all relevant IGDs (duration: 1 month)

Jan 2018 - Publication of final versions of the IGDs on frequency stability requirements

Continuous update of analysis at synchronous area level to prepare for update of non-exhaustive requirements according to the NC amendment framework

Consultation close 21/12/2018

https://consultations.entsoe.eu/system-development/entso-e-connection-codes-implementation-guidance-d-4/consult_view/

Overview plan for next months