Ref: SOESC 05-02

5th System Operation European Stakeholder Committee (SO ESC) Meeting & Joint SO-GC ESC session on cross-code topics

Tuesday, 12 June 2018 from 09:00 to 15:00

ACER, Trg Republike 3, Ljubljana 1000, Slovenia

Draft Minutes

Participants			
Uros	GABRIJEL	ACER	Chair
Jakub	FIJALKOWSKI	ACER/E-Control	
Marco	PASQUADIBISCEGLIE	ARERA	
Thomas	HOELZER	BNetzA	
Jean-Philippe	PAUL	ENTSO-E	
Knud	JOHANSEN	ENTSO-E	
Ralph	PFEIFFER	ENTSO-E	
Sonya	TWOHIG	ENTSO-E	
Kristel	ROMEO	ENTSO-E	
Stela	NENOVA	ENTSO-E	
Ioannis	THEOLOGITIS	ENTSO-E	
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Luca	GUENZI	EUTurbines	
Ton	GERAERDS	VGB Powertech	
Klaus	OBERHAUSER	VGB Powertech	
Pierre	CASTAGNE	EURELECTRIC	
Sanni	AUMALA	EURELECTRIC	
Adolfo	LOPEZ TEJIDO	EURELECTRIC	
Thomas	LESCARRET	EURELECTRIC	
Garth	GRAHAM	EURELECTRIC	
Michaël	VAN BOSSUYT	IFIEC	
David	SPILLETT	GEODE	
Srinivasa Raju	ADDALA	EUGINE	
Marc	MALBRANCKE	CEDEC	
Florentien	BENEDICT	CEDEC	
Brittney	BECKER-ELZAREI	EASE	Via webstreaming
Pavla	ERHARTOVA	Europex	
Eleni	DIAMANTOPOULOU	ClientEarth	Via webstreaming
Julie	FINKLER	ClientEarth	Via webstreaming

Joint SO-GC ESC session on cross-code topics

Tuesday, 12 June 2018 from 9:00 to 11:30

1. Opening

The GC ESC Chair Uros Gabrijel (ACER) welcomes the participants to the joint SO-GC ESC session on cross-code topics. The agenda for the joint session is adopted.

2. Wrap up on the creation of the new EGs

Ioannis Theologitis (ENTSO-E) explains the results of the stakeholder survey regarding the prioritization and selection of topics for the EGs to be established under the GC ESC umbrella as concluded at the 9th GC ESC and provides the ENTSO-E proposal on the approach forward for the establishment of the EGs. Based on the results of the survey and on the proposal by ENTSO-E, the GC ESC agreed on choosing 3 topics for the EGs to start with as a priority at this stage, out of a list of 9 relevant topics (results of survey available here). The 3 topics as chosen for the EGs are: definition of storage devices, requirements for hydro pump-storage modules, and clarifications about mixed customer sites with generation, demand and storage and definition of system users. A clear separation between GC and SO ESC issues in relation to storage and pump hydro will be ensured through clarifying the scope of the EGs in the ToRs and making this distinction clear as relevant. The EGs will be working under the GC ESC. The ToRs will clarify the roles of the chair/vice-chair, also taking into account the interest expressed by the DSO associations to contribute more actively to the EGs through a co-chair position. *For further details on the discussion and the agreed process for establishing the ToRs, please see minutes of the 10th GC ESC meeting.*

3. Follow-up on the questions raised at GC ESC:

3.1. Measurement precision of frequency and the definition of insensitivity in SOGL and NC RfG:

Ioannis Theologitis (ENTSO-E) provides an overview on the work of the EGs on High Penetration (HP) and Compliance Monitoring (CM) (slides available here).

The EG on HP has so far worked on the release of 2 IGDs, and is currently working on a joint report on grid forming capabilities related to future grid/network codes. The group is focusing now, between 2017 – 2019, on HP with a longer-term analysis and input into issues of extreme high penetration of non-synchronous generation. A draft report will be released for consultation end of 2018. The EG CM has been revived and ENTSO-E and CENELEC (TC8X WG3) met end of April 2018 and agreed to work together on compliance monitoring in the context of drafting the EN 50549-10. The EG might work further on possible adaptations to the IGD on CM. EG CM members were invited to join the CENELEC WG3. Future updates on the work of the EG CM will be provided jointly by CENELEC/ENTSO-E to the GC ESC.

New IGDs to be published by June 11th include the IGD on embedded HVDC systems, on interactions between HVDC systems and other connections, and on HVDC systems default parameters. The final versions consider consultation comments and are available here.

3.2. Feedback on whether TSOs would accept the same type of equipment they use in operating their systems to be owned by generators:

Ralph Pfeiffer (ENTSO-E) provides ENTSO-E's answer on the question whether NC RfG requires system users to use (more expensive) equipment with a rated voltage of 550 kV (which is the next higher equipment class as defined by the relevant IEC standards (slides available here). ENTSO-E's conclusion is that the NC RfG does not define specifications and does not prescribe which equipment to use but this does not release the equipment owner from the risk assessment and associated responsibilities/liabilities. The equipment owner shall require the manufacturer to declare NC RfG compliance (e.g. demonstrated by tests, even if such tests are not covered by standards). If the technical capability as required by NC RfG is covered by an equipment standard and the manufacturer warrants that the equipment complies with the standards, the equipment user would still remain responsible vis-à-vis the system operator, but could typically pass on responsibility/liability for malfunctioning of the equipment to the manufacturer (as long as the equipment was operated within the design limits). If on the other hand the technical capability as required by NC RfG is not covered by an equipment standard, the manufacturer would typically not warrant the proper functioning, if the equipment was tested only under conditions defined by standards. Nonetheless, the system user may still require the manufacturer to carry out tests beyond the conditions defined by standards to demonstrate NC RfG compliance. Otherwise the system user typically could not pass on responsibility/liability to the manufacturer. NC RfG does not define specifications or prescribe which equipment to use, but this does not release the equipment owner from the risk assessment and associated responsibilities/liabilities. The equipment owner should require the manufacturer to declare NC RfG compliance (e.g. demonstrated by tests, even if such tests are not covered by standards).

In order not to spend time on this item with duplication of discussions, the Chair notes that the topic was extensively discussed at the 9th and 10th GC ESC meetings and all comments received are equally applicable for the SO ESC and the joint session (see the minutes of the GC ESC meeting for further information).

Regarding the measurement precision of frequency, the Chair concludes that this remains as an outstanding topic for the next meeting in September.

4. Outcome of the workshop on dynamic stability assessment and studies on minimum required inertia

Knud Johansen (ENTSO-E) provides an update on the state of play on the dynamic stability assessment (DSA) work across Europe for the implementation of Articles 38 and 39 of SOGL (slides available here) and on the ENTSO-E stakeholder workshop on DSA which took place on 23 May 2018. In order to coordinate activities to fulfil the relevant SOGL requirements, a DSA project was established in May 2017 to facilitate coordination through ENTSO-E TSO workshops on the topic. Two TSO workshops took place in November 2017 and April 2018 with the objective to gather and exchange information on current practices and discuss how coordination at regional levels can be secured as per SOGL requirements. A 3rd TSO workshop will take place on 20 September 2018 while a 2nd DSA stakeholder workshop will be organized on 30 October 2018 to gather further stakeholder feedback on the studies. By the end of 2018, the DSA will be delivered as part of the SOGL requirements. The DSA includes three areas for stability – rotor angle, frequency and voltage stability within both short and long-term horizons, and is needed as the steady-state (n-1) contingency analysis is not complete so additional calculations are required regarding system stability estimations.

Regarding RG CE, based on Article 38 requirements "some feedback on yearly DSA and coordination should arrive in the beginning of 2019," dynamic models will be available for TSOs to execute DSA studies. Article 39 requirements have to be fulfilled within 2 years after SOGL EIF. A report consolidating the existing results for CE is expected in Q2-2019. As Continental Europe (CE) is a very big synchronous area, in some parts there are special grid considerations, also regarding the need for adequate geographical distribution of inertia to keep the system stable. For RG CE dynamic analysis at operational timescales is carried out at TSO level for rotor angle and voltage stability issues where applicable. Currently, a definition of a minimum inertia tipping point for interconnected operation is not required. In case of a system split, various scenarios have been investigated (for emergency state) and the methodology for establishing such scenarios is still subject to discussion. The RG CE expert group for system stability (ENTSO-E System Operations Committee SPD group) will continuously monitor system disturbances, propose mitigation measures and validate dynamic system models.

For the Nordics, a tool has been developed to monitor the system inertia in the region in real-time. Off-line studies are already possible for the countries and nearly real-time DSA will also be possible as the Common Grid Model (CGM) will include dynamic aspects in the model. Further work is still needed to adapt the Nordic models to suit CGMES-standard. The Nordic System Operation Agreement will cover suitable measures to handle low inertia situations that might appear.

In the RG GB, the Dynamic assessment is already carried out according to Article 38.1-2, with National Grid (NG) as the sole entity with SO responsibility for coordinated dynamic stability in GB synchronous area. Dynamic assessment rules specific to the GB synchronous area are developed according to Article 38.6. Regarding Article 39, the NG proposal is to maintain dynamic stability requirements at a synchronous level in accordance with the existing approach.

In the RG IE/NI area, the requirements of Article 38 and 39.1-2 are fully fulfilled and a Wind Dynamic Security Assessment Tool (WSAT) automatically runs every 5 minutes (24/7 for 365 days/year) in both Ireland (IE) and Northern Ireland (NE) Electricity Control Centers, assesses transient stability directly and indicates violation of stability limits, while also suggesting remedial actions.

For the RG Baltics, due to the strong connections with Russia, dynamic security is not a critical issue. Currently no issues with minimium inertia criteria have been identified under normal operating conditions but relevant aspects can be later explored once the Baltics have decoupled from Russia. Knud Johansen (ENTSO-E) thanks the stakeholders for their contributions and feedback received at the workshop. As next steps, ENTSO-E will look further into integrating the comments received into the work in the upcoming workshops in the fall (such as creating a common set of scenarios if possible as recommended by ACER, among others).

Ton Geraerds (VGB) explains that according to Recital 25 of the NC RfG, countermeasures should be taken to avoid higher values for RoCoF during high RES production, so he would like to get the impression from other stakeholders on their thoughts about this aspect. His impression is that higher values of RoCoF are reached without any countermeasures, which is not acceptable from his perspective.

Knud Johansen (ENTSO-E) explains that there is an IGD on RoCoF which tackles this aspect and that in the past years high values of RoCoF have been observed. The values depend on how the frequency is measured and what the basis for comparison is. There is no international standard on how to measure frequency.

Ton Geraerds (VGB) notes that so there should be a method on how to measure frequency to be defined in NC RfG, but is currently missing there. If there are very high values for RoCoF, turbines and generators will face significant issues. The NC RfG states that RoCoF will not go to higher values as countermeasures shall be taken.

Thomas Lescarret (EURELECTRIC) supports Ton Geraerds (VGB), noting that when stakeholders read that TSOs should take some measures to avoid extreme fast deviation of frequency, the understanding is that there are also other solutions in addition to conventional generators to create inertia, as well as studies regarding the evolution of technologies. Stakeholders would appreciate to have some regular reports about these studies and technologies' evolution.

The Chair reminds that there is a common understanding that ENTSO-E will continuously keep stakeholders involved in the development of the studies, also through relevant workshops.

Ralph Pfeiffer (ENTSO-E) clarifies that with regard to RG CE the requirements for RoCoF are needed in order to cope with out-of-range contingencies like a system split where high RoCoF values would be observed.

Ton Geraerds (VGB) notes that the value used (0.5Hz used commonly as a number) should not be changed dramatically when measures are taken because otherwise the generators will not survive. **He is willing to deliver a document on this topic and a presentation about such cases.**

Jakub Fijalkowski (E-Control) inquires if there are plans for monitoring inertia for RG CE like the system in the Nordics, and whether there is data available on the lowest inertia and highest instantaneous non-synchronous generation in the RG CE area at a given point in time, and whether it is possible to see how this is changing from year to year. Such data might show some trends and indicate a point in time where there might be a potential need for future actions. **It would be beneficial if ENTSO-E could consolidate such data for low-load situations from all the systems and come up with a number.**

Knud Johansen (ENTSO-E) explains that for IRE/NI and GB they are doing such plans, in some part of Central Europe that is in place in some TSOs, etc., and there could be ways to share these tools related to stability among some TSOs. Further discussion can be pursued at a next workshop regarding low-load situations and **ENTSO-E can report results in one of the next ESCs.**

Michael Wilch (EDSO) notes that with regard to the fundamentals of the overall situation, it is interesting to see the tipping point when you reach first stability limits and then thermal limit (n-1), and asks if there is further information if we are close to the tipping point or of when we expect to reach the tipping point as there are many countermeasures possible. He would like to get more insight into what the expectations are about stability limits as opposed to thermal limits in continental Europe, and further grid scenarios as to how relevant or likely it is to have a system split.

Knud Johansen (ENTSO-E) explains that the TSOs are using the thermal limits and countermeasures based on these parameters, but if a system split happens as seen in the past, then some parameters will be in the focus, it would be a different situation depending on how one looks at it. In the Nordics, it is different from Continental Europe with regard to applicable countermeasures. 165 different scenarios were discussed but the involved TSOs still need to find some conclusions and facts to structure the outcome. It is expected that an overview of findings will be available in October this year and to be further processed at the next TSO WS in September.

Ralph Pfeiffer (ENTSO-E) explains that it should be differentiated between the various stability issues. System stability is a manifold issue and shall not be limited to frequency stability. Within Continental Europe frequency stability is not an issue under normal system operating conditions, but other stability aspects may be (in DE grid for example the system is potentially not far away from limits regarding voltage stability). There is no single tipping point for system stability across the synchronous area of RG CE and this varies a lot on a regional basis. A number of scenarios are investigated to see if stability limits are within the range of normal operating thermal limits. Some analyses have been performed and results are publicly available regarding the situations that may cause the system to approach/reach stability limits, but those vary widely on a regional level and need to be further studied at national level. For DE for example, such analysis and scenarios are investigated in the DE grid development plan.

Michael Wilch (EDSO) would like to see more analysis on this regarding the different types of stability and parameters concerned leading to such situations, and recommends further discussion on this aspect, starting from the analysis available and deriving some conclusions regarding what needs to be changed for grid users, SOs, and deriving some measures to avoid reaching the tipping points in the future in Europe.

The Chair invites all stakeholders to consult the reports available to use the input as a basis for further discussion with a view to forming a European view on this.

Jakub Fijalkowski (E-Control) notes voltage stability and frequency inertia should be differentiated as the first one is more local/national, while here a stronger focus should be put on the latter one in the context of synchronous areas. He invites more analysis on the current status of inertia in the RG CE area, to complement the analysis on national or smaller regional basis.

Knud Johansen (ENTSO-E) notes that the TSOs will have a Workshop in September on this topic and ENTSO-E can further report on this to the ESC meeting in December.

On RoCoF, the Chair invites ENTSO-E to provide a European overview of the countermeasures that TSOs are considering in application of these requirements as per NC RfG. Knud Johansen (ENTSO-E) clarifies that a minimum inertia and the requirements on fast frequency functions are solving the same stability issues and as so they need to be analysed together.

5. Roadmap for updating ENTSO-E stakeholder consultation processes and practices, update on the consultation document, update on network code communication

Stela Nenova (ENTSO-E) provides an overview on the state of play of the ENTSO-E consultation process document update foreseen for 2018. ENTSO-E has gathered feedback through the ESCs, the ENTSO-E annual stakeholder survey, and the ENTSO-E Advisory Council, and is working on integrating those suggestions into a new version of the consultation document. As the document is part of the ENTSO-E Association documents, its update will be subject to a submission to and an opinion by ACER and the EC. The consultation document will be subject to a formal stakeholder consultation, once it has been internally approved. The update of the ENTSO-E consultation document will further take into account and prepare for the anticipated additional mandates of ENTSO-E and for the cooperation with the future DSO entity as the CEP enters into force in 2019, while reflecting the experience gained so far and best practices.

In the update to its consultation policy, ENTSO-E will aim for a product development approach fit for each deliverable through differentiated requirements depending on the complexity, scope, legal deadlines, and the urgency of different deliverables, as well as to provide adequate consultation timelines as per stakeholder requests. ENTSO-E will look into providing ample opportunities and adequate channels for early stakeholder involvement and improved visibility and transparency both through developing better structured consultations, enabling a simplified consultation response procedure, and providing an inception document at the start of each product, outlining objectives, scope, target groups and timelines for developing the proposal and for relevant stakeholder contributions. Workshops, webinars and other interactive tools will likewise continue to play a key role in ensuring early engagement and continuous opportunities for stakeholders to provide input to ENTSO-E products throughout the various stages of the development and drafting process. ENTSO-E welcomes additional suggestions for further improvements on the consultation process document and will aim for early implementation of its updated policy.

Sonya Twohig (ENTSO-E) informs that ENTSO-E is currently developing an NC app to help transparency on NC documents' development and information sharing with stakeholders. The app should be available for wider use by October. Stakeholders who would like to test the app and provide suggestions in the prototype phase should let ENTSO-E know. Stakeholders welcome the idea of the NC app.

Pierre Castagne (EURELECTRIC) welcomes the recent consultation process improvements and the ideas for the update to the consultation document. It would be appreciated if in the final stage once stakeholders have submitted their comments through the formal consultation platform, they could get more information on the process and if they could also see other stakeholders' responses as submitted. Michael Van Bossuyt (IFIEC) and Michael Wilch (EDSO) agree that this could further help stakeholders align. Stakeholders would further appreciate more flexibility on the timelines where possible with a view to anticipating better the launch of the consultations and providing an additional loop for stakeholder engagement.

Michael Wilch (EDSO) notes that the current governance makes it difficult for stakeholders to understand what happens in the phase after the formal consultation has closed. Stakeholders would like to be offered more possibility to explain the inputs they provided in the formal consultation phase, as they worry that maybe they didn't explain their issues and objectives well enough through the formal consultation tool.

Garth Graham (EURELECTRIC) notes that it was highly appreciated when during the NC development process ENTSO-E did workshops to explain the changes made to the proposals once stakeholder comments were submitted and encourages ENTSO-E to continue this effort as a good practice, by offering more stakeholder engagement opportunities in the pre-first draft stage and more engagement in the last stage prior to finalizing a document.

ENTSO-E is striving to explain the various stages of the process to stakeholders, including how comments are taken into account, when starting off the work on various deliverables and planning workshops. Rigid and tight delivery timelines are a significant challenge for ENTSO-E when it comes to providing additional loops for stakeholder interaction in the last stage before finalizing a given proposal. Having regard to NC time-lines in order to provide for further engagement is also a challenge for ENTSO-E. ENTSO-E will look into taking these comments into account and providing additional possibilities for stakeholder interaction, throughout the proposal development.

The Chair notes that an additional round of public consultation would be appreciated during the NC development process or more flexibility can be explored in the preparatory phase of ENTSO-E proposals. He agrees that the stringent deadlines represent a significant challenge. A message should be brought to the NC IMG that in the future planning of NC deliverables sufficient time is provided to include more than one formal public consultation on a specific NC. This could be achieved by adequate preparatory work that will need to be done by ENTSO-E and/or the forthcoming EU DSO body. Feedback could also be given by the relevant ESCs to the NC IMG to inform the EC invitation for a piece of deliverable. Good practices from the implementation of the 3rd Energy Package should also be continued (ex. CNCs were scoped before the formal request for drafting of Framework Guidelines has been sent to ACER and this allowed everyone to cope with stringent deadlines imposed by the regulation).

6. AOB:

The ESC agrees to change the meeting place for the upcoming September SO and GC ESCs to Brussels, at ENTSO-E premises: dates remain the same - SO ESC starting with lunch on 13 September and meeting in the afternoon; and 14 September, with the joint SO-GC ESC in the morning and GC ESC afterwards.

7. Follow-up actions of Joint SO-GC ESC:

1. The question on measurement precision of frequency and the definition of insensitivity in SOGL and NC RfG remains as an outstanding topic for the next meeting in September. Ton Geraerds (VGB) will deliver a document on the topic and a presentation concerning the actual RoCoF and consequences for synchronous generators in CE.
2. ENTSO-E will look into the request regarding data and trends on inertia and instantaneous non-synchronous generation in the CE area as well as consolidated figures on low load situations, and report results in one of the next ESCs.
4. ENTSO-E is invited to provide a European overview of the countermeasures that TSOs are considering in application of these requirements as per NC RfG.
5. Stakeholders who would like to test the ENTSO-E NC app and provide suggestions in the prototype phase should let ENTSO-E know.
6. ENTSO-E will look into providing additional possibilities for stakeholder interaction, especially in the last phase of the TSOs' proposals development. ENTSO-E will consider the request for publishing the stakeholder responses directly as submitted after the consultation closing.

5th SO ESC European Stakeholder Committee (SO ESC)

Tuesday, 12 June 2018 from 11:30 to 15:00

1. Opening

1.1 Welcoming Address and Draft Agenda

The Chair, Uros Gabrijel (ACER) welcomes the participants to the 5th SO ESC meeting. The draft agenda is approved.

1.2. Review and approval of the minutes from previous meeting

The minutes of the 4th SO ESC meeting are approved without further comments (available here).

1.3. Follow-up actions from previous meeting (slides available here)

1. *Action 1: SO ESC has been informed of the publication of the minutes of the NC High-level Implementation Group meeting on the ENTSO-E website (available here).*
2. *Action 2: ENTSO-E will look into how national implementation is followed upon in the framework of the CNCs in relation to ER implementation. Analysis is still ongoing and an update on that will be provided at the next SO ESC in September.*
3. *Action 3: ENTSO-E will consider the stakeholder request for providing justification/cost-benefit analysis based on topics identified and can provide additional input and specific analysis where deemed necessary on an ad-hoc basis, as otherwise this might slow things down if it has to be done for every single proposal. Michael Wilch (EDSO) recommends that regarding the need for justification, earlier engagement may help ENTSO-E get more input as to where a CBA might be beneficial in the process and a justification could already be provided at that stage.*
4. *Action 4: NRAs will update stakeholders on the process of the approval for KORRR under agenda item 2 of the SO ESC.*

5. *Action 5: Regarding the question on technical differences on achieving parameters in ER (LFDD) across various countries, ENTSO-E is working on analysis of the question and ENTSO-E will provide an update at the next SO ESC in September in addition to further explanations as provided under agenda item 3.*
6. *Action 6: SOGL: ENTSO-E will look at the legal concern raised by the DSOs regarding communication line requirements and provide an update at the next SO ESC in September as analysis is still ongoing.*
7. *Action 7: ENTSO-E and EC will contribute to answer the questions raised by VGB regarding interpretation of certain articles in the SO codes and Connection NCs. Answers will be provided for the next SO ESC meeting in September.*

1.4. NC High-Level Implementation and Monitoring Group (NC IMG)

The NC IMG will hold its 5th meeting on 2 July. The outcomes of the meeting will be published on the websites of the EC, ACER and ENTSO-E. The topics on the agenda include monitoring and transparency, state of play on NC implementation, transparency platform, bidding zones and lessons learned, among others. The update of the current ACER guidance document on NC amendments will be also discussed as there is a need to reflect the ESCs and to establish a clear process for amendments. ENTSO-E can present proposals on this in the September SO ESC meeting. The EC will present a list of upcoming studies.

The Chair presumes an amendment of the guidance document will follow the same procedure as for the drafting of the existing document and more information will be known by September. In the previous NC IMG meeting, ACER was asked to update the document, and the EC will provide their views on the amendments of the guidance document.

Garth Graham (EURELECTRIC) notes that regarding amendments it would be useful if the NC IMG could give further guidance on how to proceed with amendments, given also the context of national Network Code changes, and if the process will be open to all stakeholders in the Union, or if amendments would be further channelled through ESCs. More understanding is needed as to who can make a proposal, how etc.

Sonya Twohig (ENTSO-E) explains there are various national examples but ideas can be gathered regarding a suitable process, the role of the ESCs, etc. as the amendment process at the European level would be more complex.

The Chair concludes that ENTSO-E should take these comments to the NC IMG and clarifies that guidance will be in line with existing regulation which says that the amendment process is open to any person likely to have interest in the NC.

2. SOGL implementation:

2.1. Updates on ongoing activities: CSAM and outage planning coordination

Jean-Philippe Paul (ENTSO-E) provides an overview on the consultation results for the CSAM (SOGL Article 75) and the outage planning coordination (SOGL Article 84) (slides available here). The most comments on the CSAM consultation were received on the topics of influence computation method (Article 3), identification of observability area elements (Article 4) and coordination of remedial actions and inter-RSC coordination topics. Regarding the computation method, stakeholders requested further clarifications on which data models is used for observability. Using yearly scenarios for this, in case there is difference, the TSO will use its own national model complemented with DSO additional data.

Regarding the consultation on relevant assets for outage coordination, ENTSO-E is finalizing the process to conclude the methodologies based on the comments received by stakeholders.

Pierre Castagne (EURELECTRIC) inquires if possible to have a deep dive on some articles or publish the comments as received already before the final proposals are done.

ENTSO-E will look into the possibility of publishing only the comments received to the consultations for information purposes at this earlier stage. The responses to the individual stakeholder comments and explanations on what was taken on board from the comments will normally be published at the final stage together with the publication of the final proposal submitted to NRAs.

2.2. Synchronous area operational agreements

Bruce Riddington (ENTSO-E) explains the state of play on the policy on LFC and reserves articles which were consulted publicly as per Article 118 SOGL (slides available here). Regarding Sections A1, A5 and A6, the project teams are working on the comments received. Section A2 is the only one requiring further amendments based on stakeholder consultation comments.

Regarding Section A-2, paragraph 3.1., the text has been modified to allow the TSO to exercise discretion over provision of response with an activation beyond the 2s acceptable activation delay in case the power generating facility owner can provide technical evidence demonstrating the need for longer activation times. All comments received regarding FCR frequency ranges to stay connected to the grid (Section A2-paragraph 3.2) have been included in the revised proposal. Regarding paragraph 3.3 on limited energy reservoirs, the text has been updated to include the comments received. Regarding paragraph 3.4 on limits for centralization of frequency measurement, discussion is still ongoing as to how to update the text. On paragraph 3.5, continuing activation of FCR also at frequency deviations, a new text proposal will be formulated to account for stakeholder comments.

Thomas Lescarret (EURELECTRIC) thanks that the comments sent were taken into account in paragraph 3.2, and wonders regarding paragraph 3.3 whether it is not too early to specify requirements on electricity storage given the fact that an EG on storage will be launched soon to work on relevant aspects. He wonders where battery storage can be considered and if a specific paragraph can be added. There are also more topics on operational aspects of storage than on capabilities, also as a means to fulfil FCR or ancillary services.

Bruce Riddington (ENTSO-E) explains that limited energy reservoirs are in the focus of paragraph 3.3 rather than references to safe charging as the intention was to be more generic rather than focus on battery storage.

The Chair reminds that as concluded at the 10th GC ESC, the EG on storage would work under the GC ESC and on requirements for connection while the topic raised here is a system operation related. Underlying assumptions may impact the scope of work, but if it is found that the scope of energy storage concerns SO topics, then a discussion is needed on how to deal with this, e.g. whether an additional EG should be created under the SO ESC. Similarly, hybrid connections might also bring complexities to the scope of the work concerning CNC requirements affecting investment decisions and the participation in the ancillary services' market.

Garth Graham (EURELECTRIC) notes that FCR is a voluntary service provided or not but if the TSOs have specified what the reservoir is in their area; then it is different and could discriminate. If a battery was to connect and offer to provide the service, then the TSOs would have to take that same service from the battery, so the TSO would take the requirement from the device, regardless of where it comes from – it should not matter where the FCR comes from so long as it is provided. The service one obtains also has to be identical even if batteries are not bound by NCs and the outcome would be discriminating in the provisions of the service.

Bruce Riddington (ENTSO-E) clarifies that the paragraph is written to avoid discrimination against batteries, and that the requirement is to open for FCR to allow all provision to be available and not to discriminate between provisions.

Jakub Fijalkowski (E-Control) notes that different requirements in synchronous areas will have direct impact on the market (given FCR exchange between SAs) and market share for new investments. He would like to ask ENTSO-E's view on this impact on the market and potential investments.

Klaus Oberhauser (VGB) wonders if the 30min would be changed or if this is to be seen as a max requirement as currently in some countries the need is 15 or 20 min, and there are ongoing discussions to harmonize the number. Bruce Riddington (ENTSO-E) explains that this number is for Continental Europe and it should be the same for all providers in the area.

Jakub Fijalkowski (E-Control) clarifies that the CBA methodology to define the minimum activation time is the same for CE and Nordics, however, bearing in mind different frequency quality target parameters this does not necessarily mean that Nordics and CE will be harmonized together.

Pierre Castagne (EURELECTRIC) recommends inserting in brackets 15/30min and not just 30min.

2.3. Common Grid Model (CGM)

Jean-Philippe Paul (ENTSO-E) explains the state of play of the CGM methodologies. CGMM-v1-plus (pursuant to CACM) has been approved. CGMM-v2 (pursuant to FCA) was amended and all TSOs except one had submitted the amended version to their NRA as of 5 June 2018. NRA decision was expected at ERF meeting on 6 June 2018. CGMM-v3 (pursuant to SOGL) was submitted by all TSOs to their NRAs by 21 March 2018 (last submission). The decision of NRAs is expected by 21 September 2018, with indications for no concerns on the side of NRAs. The expectation is that by October 2018 the CGM methodology framework will be in force for all timeframes.

Jakub Fijalkowski (E-Control) informs that NRAs have agreed to approve now CGM v2 and v3 and that national decisions will be issued consequently. The deadline for NRA decisions (6 months) is counted from the last submission received by an NRA.

Jean-Philippe Paul (ENTSO-E) explains that as all 3 versions of the CGM have been approved by all NRAs, a consolidated version could be legally replacing the 3 previous ones that were approved. TSOs are waiting for an explicit NRA request on whether to proceed in this direction and how, taking into account the resources needed.

Garth Graham (EURELECTRIC) recommends that regarding the merging of the 3 CGMMs and 2 GLDPMs, it would be useful if the consolidated version used different colour text for the 3 different versions to make it easier to distinguish what has been approved and what has been carried over from the various original versions.

The Chair concludes that the NRAs will look into that proposal.

2.4. Regional Security Coordination

Jean-Philippe Paul (ENTSO-E) provides an update on the state of play of developing the RSCs and the 5 services as per the SOGL across the various RSCs through the ENTSO-E RSC implementation project. CORESO and TSC were first established on a voluntary basis to help TSOs cope with challenges identified after the European system split on 4 November 2006. In December 2015, European TSOs and ENTSO-E signed the Multilateral Agreement to facilitate the implementation and rollout of standard services provided to TSOs by RSCs throughout Europe. In 2016, the Nordic, Baltic and SCC RSCs were established and are operational, fulfilling the mandatory requirements for delivering 5 tasks as per the SOGL and the ER NC which entered into force in 2017. The five tasks include: coordinated capacity calculation, common grid model, coordinated security analysis, outage planning and adequacy forecasts. CSA and capacity calculation require some methodologies pursuant to SOGL and CACM. The CE CGM format (UCTE DEF) migration to CGMES is ongoing and advanced OPC and SMTA field-trials have started with go-live 01/2018. Stepwise rollout and implementation of all tasks and inter-RSC cooperation agreements according to SOGL is ongoing with the aim to complete relevant methodologies and common tools for the mid to end 2019. The completion of implementation with rollout of all services is expected by 2020/2021 and will be complemented by the future CEP framework.

2.5 Update on submitted proposals - ACER

Jakub Fijalkowski (E-Control) explains NRAs received 4 methodologies: first one was due 14 January, the others on 14 March. The proposal for LFC structure per synchronous area, the TSOs from Nordics did not agree at first instance, but with small delay the TSOs eventually agreed. The GB being a synchronous area on its own was easy. Regarding CE, amendments were requested due to legal reasons: the EC said the proposal cannot include non-EU MS, so a request for amendments was approved by NRAs. TSOs are expected to submit the amended methodology for LFC structure by 15 July as to allow its approval by 15 September, which is the deadline for submission of LFC block operational agreement (incl. reserve sizing).

On KORRR, NRAs are working on a request for amendments, pending a regulatory forum approval on 18 July. When a request for amendments is sent, then TSOs have to resubmit the amended version within 2 months of the request. NRAs would have then 2 months to agree on it.

Regarding the Nordic and Continental Europe proposal for a CBA for FCR providers with limited energy reservoir, the NRAs will also issue a request for amendments; the approval is expected also on 18 July. The next methodology is the CSAM which has to be submitted to NRAs on 14 September.

3. Emergency and Restoration NC implementation: update on ongoing activities

Knud Johansen (ENTSO-E) provides an update on the state of play on ER (slides available here). In April 2018, an internal ENTSO-E workshop took place with the aim to share among TSOs questions on NC ER implementation (e.g. general rules how establish list of substations essential for system restoration). Lots of rules and regulations are implemented at national level but coordination is needed at synchronous area level. The UCTE Operation Handbook policy 5 (applicable only for Continental Europe) already includes some relevant provisions on that.

Regarding LFDD, the ER requires 6 levels of LFDD procedures and coordination with NC DCC would be needed. ENTSO-E will respond at the next SO ESC meeting regarding this requirement as it is not easy to calculate the amount of generation that disappears when demand is disconnected since that leads to a disconnection of the integrated generation, and not just the demand. Different MS use different ways to calculate total demand.

On technical requirements for voice communication (Article 41.3), Knud Johansen (ENTSO-E) explains that it is different from one MS to another. It is understood that voice communication should last even during outages, but there are no new requirements introduced. A draft text on this aspect is under internal ENTSO-E consultation.

Regarding the coordination rules for suspension and restoration of market activities, there are rules on parameters to be looked at for market suspension and on how to restore the market, but rules for re-establishing the market as soon as possible after suspension are also needed. **ENTSO-E is working on a draft proposal with general principles for suspension and restoration to be presented during next SO ESC in September.** The proposal aims to include guidance when to suspend the specific market activities (market coupling, balancing activities etc.).

Regarding Article 6, regional coordination is under ENTSO-E and the RSC project is working on implementation of the different tasks as required.

ER NC implementation in 2018 is mainly at national level and the implementation schedule varies from country to country depending on different TSO needs (e.g. in Article 11.4.c & Article 23.4.c) in one country is solved now in national legislation (including NRA approval), in others it still needs to be established). Coordination of the national restoration procedure among the TSOs and with the DSOs is necessary as well. Defense service providers will also be placed to provide the necessary defense. A discussion between TSOs and DSOs is ongoing in MS. The system defense and restoration plan is to be notified to the NRA according to the ER, and each SO (TSO and/or DSO) can publish their implementation plan on a voluntary basis or upon NRA request.

Michael Wilch (EDSO) welcomes the overview and state of play on ER implementation. From a DSO perspective, he would like to be involved in the discussions related to Article 41.3 of NC ER as DSOs are consulted at national level by the respective TSO. He fears that if TSOs already agree between themselves on the requirements, there will be less flexibility as to solutions that can be agreed at national level. Regarding load estimations and LFDD, he recommends that TSOs and DSOs talk and try to find together some different good solutions. Perhaps TSOs and DSOs need to agree on a European level as for ER, the DSO work is critical in the restoration process and very close cooperation is crucial with the TSO.

The Chair notes the outstanding point to ENTSO-E is to collect national implementation plans and to make them available on the website in a similar manner as currently done with the CNCs, including finding the responsible parties to upload plans, contacts etc.

Garth Graham (EURELECTRIC) notes that there are links with grid units, type A and B and it would be interesting to see the plans and the thresholds that are applied. In GB, it is 300MW, but in case someone is classified as an SGU, then it is also different. He notes the national plans may need to be updated to ensure alignment with the NCs and the new obligations they place on certain types of plants, and for the new types of plants that did not exist before. Publication of the plans would be important as to ensure the relevant plants are aware of their obligations.

Knud Johansen (ENTSO-E) clarifies that SGUs based on NC RfG would include types B, C, and D; in the case of an aggregator, it depends on how many units are aggregated, but a connector/BRP is classified as an SGU.

Jakub Fijalkowski (E-Control) wonders regarding LFDD if the TSOs plan to make a guidance/recommendation or harmonization on how to consider generation embedded at the lowest voltage level (Type A). If yes, this would be welcome but it would also be a significant challenge. **The offer of Michael Wilch (EDSO) and the DSOs should be considered as they are important and Jakub Fijalkowski would like to see more information on how the TSOs approach this question in a future meeting.** Jakub Fijalkowski (E-Control) notes that regarding suspension of market, the rules for imbalance settlement are critical. He recalls that ENTSO-E also has to make a report on harmonization of the rules for suspension and restoration of market activities. **This should be also brought to the BSG.**

4. Stakeholder topics:

4.1. Eurelectric presentation:

Michael Wilch (EDSO) explains on behalf of the Eurelectric DSOs four aspects with the CSAM as developed and consulted by ENTSO-E, mainly **regarding CGM requirements, data requirements for dynamic simulations and voltage influence factors**, **determination of the Observability Area (OA), and coordination-process between TSO and DSO for determining the OA** (slides available here)**.** Regarding requirements on CGM, the CSAM seems to include additional requirements on the Common Grid Model (CGM), e.g. Article 3, while the CGM is defined referring to Article 67 to 70 SOGL in the CGMM. He recommends that all definitions and requirements on data for the CGM should be included in the CGMM where they naturally fit better instead of being a part of the CSAM. Upon discussion with ENTSO-E on this aspect, it appears the CGM is finalized and there is no chance to put additional requirements. He wonders if there is a revision process foreseen for the CGMM during which the 2 methodologies could be aligned to have the CGMM relevant requirements only in one of them.

Jean-Philippe Paul (ENTSO-E) clarifies that no additional requirements are provided on the building of the CGM, but the reference is about how to use it for computing factors. Regarding Article 38, timelines are provided to ensure that frequency of ID updates in the CGMM will be reviewed and checked if sufficient. That's not in scope of modifying the CGM but it is rather a part of the global way to address uncertainties. Currently, there several updates in ID at pan-European level but in the future, there could be more. The intention is not to modify the CGMM but to give guidance on when/how to use it.

Regarding the requirements for dynamic simulation and voltage factors, Michael Wilch (EDSO) explains that from a DSO perspective, there is a need for a concrete justification and more legal certainty regarding the circumstances for which the simulations and voltage influence factors are used and which data is needed. The DSO concern is that as more information about the DSO system is needed, the TSO might end up with a larger observability area of the DSO. Regarding dynamic simulation, Article 38 requires TSOs to do those simulations to ensure stability but he wonders how this is connected with the observability area and why it is used here. Regarding the relevance of assets for the observability area, he thinks the basic methodology is sufficient.

On voltage factors, Jean-Philippe Paul (ENTSO-E) agrees that in cases where the option is given to the TSO to do something, it is normal to provide some conditions to be fulfilled for the TSO when requesting the activation. This will be provided in the CSAM. Regarding Article 38.6.b and (c), for voltage factors – the TSO needs to check that the relevant grid elements are captured in where necessary.

Regarding the determination of OA, Michael Wilch (EDSO) explains that the DSOs see a risk of interference between the OAs of TSOs and DSOs and propose that the observability area should be only as large as it has to be. On N-2 outage seems too excessive and leads to higher costs and an unnecessary increase in the observability area. He recommends a reconsideration of the calculation method to first assume first outage, take remedial actions and only then asses the 2nd outage after having some remedial actions. Regarding the determination of the observability area of the DSO area by the TSO, better coordination is needed to avoid high cost of data conversion and system risks like cybersecurity, so DSOs propose to use the CGM to do the assessment of relevant assets for the DSOs' own system and give the TSO the result.

Pierre Castagne (EURELECTRIC) agrees that the consideration of remedial actions is also a concern from a market perspective.

Jean-Philippe Paul (ENTSO-E) clarifies that regarding the OA, the objective is that in case of no agreement between the TSO and DSO, the TSO does the methodology and ensures equal treatment. The key question is to evaluate the influence of each network element – TSOs look at each element outside of their control area, and estimate the likelihood of it having some influence, by taking into account the fact that rest of network is not fully available. For simplicity, one additional element out of the area is simulated and a more limited assessment is made because the more elements are looked at, the more influence they have on the control area. On data, in case of no agreement between the TSO and the DSO, the TSO would request the data up to farthest level necessary in terms of a range at the beginning of the DSO network to allow the computation; then the TSO makes a proposal to the NRA, which ensures the requirement is proportionate to the needs and reasonable. As per Article 4, if in the application of such proposal a TSO is going too far, the DSO can argue or ask the NRA about the request. The aim is to avoid misunderstanding by adding this possibility in the requirement for the methodology. TSOs request the data and make computations for the needs of security of supply and assessment, for the contingency list and to make state estimation. It is the responsibility of the TSO to define the observability area based on the CSAM process as described to ensure security of supply but if there is also possibility to share computation with the DSO, then that can be explored as well.

Michael Wilch (EDSO) notes his comments referred to the draft which was published for consultation. If TSOs are open to agree that the DSO could also do the calculation, they do not see the need to put an obligation to all DSO to hand over all information to require the TSO to perform the calculation. He recommends a solution where either the DSOs does calculation or if DSO can't, then TSO to do it. DSOs are willing to provide transparency as much as necessary but want to avoid costs of conversion for the format to be used for the TSO system. There are some grid elements that are key and outage coordination between the TSO and the DSO is necessary and should be taken that into account in any case.

Jakub Fijalkowski (E-Control) reminds that the responsibility should be clearly stated in this case – TSOs are responsible to ensure network security and this responsibility cannot be shared with DSOs. As such TSOs have to make the calculations.

The Chair reminds that cross-border liabilities are not covered in the current framework of the Regulation, and this should be taken into account too that the observability area assessment result is an input towards the design of state estimation and all others and cannot be subject to a monthly revision – so this needs to be kept separate.

4.2. VGB presentation:

Ton Geraerds (VGB) presents several open questions VGB has with regard to SOGL and ER implementation related to tight implementation timelines and their impact on document quality and transparency, financial neutrality applicability and responsibility for bearing the costs for grid restoration, communication systems principles and international communication between exchanges, and market aspects related to requirements for striving to be balanced/helping system restoration, among others (slides available here).

Michael Van Bossuyt (IFIEC) notes that they had similar discussions and open questions in Belgium.

Garth Graham (EURELECTRIC) and Michael Van Bossuyt (IFIEC) agree that regarding system balance (linked to Article 39.c of ER NC), it is zero in a blackout state but this is not the original intention, so something needs to be done.

Jakub Fijalkowski (E-Control) notes MSs did not want further harmonization for emergency and restoration as they wanted to ensure security of supply remains with the MS. A number of the questions raised by VGB have no clear answers as the responsibility remains largely at the national level. The inter-TSO assistance framework may seek to provide some answers so ENTSO-E views would be welcome.

Sonya Twohig (ENTSO-E) explains that defense and restoration plans are regularly updated. Each TSO looks to define the high-priority users depending on the nature of sensitivity of some of those, and this is defined at national level by the MS defining the priority setting for the various types of users.

Jakub Fijalkowski (E-Control) notes that ENTSO-E can help with providing examples as this will increase further awareness; there is no current view on how the different countries approach this aspect now. He recommends a table to show what type of units are considered as SGUs.

The Chair concludes that a workshop can be set up with TSOs on this topic to raise awareness and the information can be added to the Active Library. Experts can present in more depth their national processes whereas a dedicated session can be used to present different topics and examples.

The Chair explains that these plans exist today and in the first iteration the existing plans will be put in the format required in the NC ER. There is little scope for improvement possible at this stage, but the plans will be revised and improved on a regular basis.

Sonya Twohig (ENTSO-E) explains each TSO would have to do their plan by December, but ENTSO-E will take into account the points raised. There is also ongoing work linked to the Clean Energy Package and the Risk Preparedness Regulation requirements for developing methodologies. A workshop towards the end of October, next to the dynamic simulation WS could be a possibility for this discussion.

Jakub Fijalkowski (E-Control) asks how the TSOs perceive and pursue the DSOs' willingness to participate in the development of an ENTSO-E document related to communication in emergency state.

Knud Johansen (ENTSO-E) explains this has been already discussed with the DSOs at MS level, the intention is to follow international standards as recommended by ENTSO-E (also linked to cybersecurity) for both voice and data. For example, by the end of October such a document can be shared for DK.

Michael Wilch (EDSO) notes he was not aware of this; and wonders if there is any European coordination on this aspect as it could be easier if coordination is done at European level to avoid risks of lack of coordination and underrepresentation.

Garth Graham (EURELECTRIC) notes that regarding the communication, this is not only at TSO level but ER plans go down to smaller level and generators that are not in the market might also be concerned at some point in case of need to support the restoration process. Therefore, communication both ways is needed.

5. AOB, next meeting dates

Luca Guenzi (EUTurbines) inquires if there have been any updates regarding the question raised at the previous GC ESC meeting on the 17 May 2018 deadline and the uncertainties related to the implementation of rules related to application for the mass product PGMs, and if the deadline is applicable or delayed. He has raised this with the NRA but has not received further feedback.

The Chair informs that ACER has informed the regulators about this issue, but has not collected national implementation statuses regarding this. NRAs were asked to speak to their MS. According to the minutes, all ESC members were asked to convey the message to their MS. The NC RfG is to be implemented by the MSs, and because not in all countries NRAs are designated for approving the non-exhaustive requirements, ACER has limited visibility and scope for action. **ACER will ask the NRAs of the status of this issue, and report back in September.**

The Chair reminds of the ToR's provisions concerning meeting preparations and prompts everyone to submit meeting presentations as per the ToR deadlines, i.e. 5 working days in advance of each ESC meeting, to facilitate proper preparation and discussions in meetings. A revision of the ToRs will be proposed in coordination with the MESC to underline that all stakeholders have a responsibility to provide their slides on time. **For the next meeting, any materials which are sent after the deadline will not be discussed in the regular part of the meeting.**

GC ESC	SO ESC	MESC
14 September, ENTSO-E	13 September, ENTSO-E	4th September, ENTSO-E, Brussels
13 December, ENTSO-E	14 December, ENTSO-E	5th December, CEER, Brussels

6. Follow-up actions

1. ENTSO-E will look into how national implementation is followed upon in the framework of the CNCs in relation to ER implementation and provide an update at the next SO ESC in September.
2. Regarding the question on technical differences on achieving parameters in ER (LFDD) across various countries, ENTSO-E will provide an update at the next SO ESC in September.
3. ENTSO-E will look at the legal concern raised by the DSOs regarding communication line requirements and provide an update at the next SO ESC in September.
4. ENTSO-E will provide answers to the questions raised by VGB at the 9th GC ESC meeting regarding interpretation of certain articles in the SO and Connection NCs at the next SO ESC meeting in September.
5. ENTSO-E should take the ESC comments regarding the NC development and amendment processes to the NC IMG.
6. CSAM: ENTSO-E will look into the possibility of publishing only the comments received to the CSAM and outage planning coordination consultation for information purposes at this earlier stage.
7. ER: ENTSO-E will present a draft proposal regarding general principles for suspension and restoration at the next SO ESC in September.
8. ER: ENTSO-E should collect national implementation plans and make them available on the site in a similar manner as currently done with the CNCs, including finding the responsible parties to upload plans, contacts etc.
9. The topic of imbalance settlement in the context of market suspension and the link with ER and harmonization of rules for suspension and restoration of market activities should be brought to the attention of the BSG.
10. ENTSO-E should look into organizing a workshop with TSO experts regarding the defense and restoration plans and should make available relevant information in the Active Library.
11. ACER will ask the NRAs on the status of implementation regarding the uncertainties of application for the mass products PGMs after 17 May 2018, and will report back in September on the status of this action.