Ref: GC ESC22-09

23rd Grid Connection European Stakeholder Committee (GC ESC)

22 September 2021 from 09:00-15:15

Microsoft Teams

Minutes of the meeting

Participants		
Addala	Srinivasa Raju	EUGINE
Alcazar	Freddy	EUGINE
Aren	Assiet	EUGINE
Benedict	Florentien	CEDEC
Bridi	Alberto	CEDEC
Buelo	Thorsten	SolarPower Europe
Chambers	Keith	Europgen
Chevillard	Naomi	SolarPower Europe
Dekinderen	Eric	VGB
Gabrijel	**Uros**	**ACER / Chair of GC ESC**
Gomes	Barroso Maria	ACER
Gonzalez	Adrian	ENTSO-E
Guenzi	Luca	EUTurbine - Solar Turbine
Johansen	Knud	ENTSO-E
Kaestle	Gunnar	COGEN
Kay	Mike	GEODE
Klonari	Vasiliki	WindEurope
Lewis	Thomas	SolarPower Europe
Luxa	Andreas	orgalim
Malbrancke	Marc	CEDEC
Ndreko	Mario	ENTSO-E
O'Briain	Caoimhín	EURELECTRIC

O'Connell	Elaine	European Comission (ENER)
Pasquadibisceglie	Marco	Arera
Pfeiffer	Ralph	ENTSO-E
Pint-Bello	Andres	smartEn
Quere	David	CENELEC
Rogers	Sam	ESTELA
Schaupp	Thomas	CENELEC
Schowe-von der Brelie	Bernhard	EFAC / VAZ (FGH)
Taylor	Susan	EASE
Teelahk	Anneli	EASE
Theologitis	Ioannis	ENTSO-E
Van Bossuyt	Michaël	IFIEC Europe
Vinas	Thierry	EURELECTRIC
Wilch	Michael	EDSO

1. Opening

1. Review of Agenda

The Chair welcomes the participants to the 23rd GC SC meeting and reviews the participants list to ensure that only members of the Committee or/and alternates that have informed the Chair are connected.

The Chair refers to the fact that for today's meeting, Microsoft Teams webtool has been chosen for a test run and if proves to be efficient then for the following meetings the GC ESC will use it on permanent basis. Similarly, for the SO ESC. The tool has all the features the GC ESC needs; however, it requires more discipline from the participants to control their audio and mute/unmute themselves when required.

The agenda is presented and approved (available here)

The Chair asks for any additional topics to be covered under AOB. No topics are suggested.

2. Approval of the minutes

The minutes received only a few suggestions for editorial changes which have been incorporated and are approved with no further comments (available here)

3. Follow-up actions from previous meeting/ new additions to Issue Logger (available here):

Ioannis Theologitis (ENTSO-E) presents the follow-up actions and their status from the previous meeting.

Eric Dekinderen (VGB) states that VGB has raised questions on two different topics and asks if both will be handled through Issue Logger and addressed under topic 2 of today's agenda.

Ioannis confirms the above.

Eric continues and asks what the status of the IGDs that were supposed to be publicly available by end of summer is. In particular, his interest is for the Compliance Verification IGD.

Ioannis replies that under topic 2, ENTSO-E will give some information about the IGDs.

The Chair invites the DSO associations and ENTSO-E to review the question on "P=const behavior of some loads connected via power electronics" (line 86 in the Action Tracker) and assess the importance of the impact and the cross-border relevance.

Srinivasa Raju Addala (EUGINE) refers to the monitoring file which is uploaded on the Active Library. Although the work is very much appreciated and the file is useful, there are a few outdated requirements listed or in cases the information is incomplete e.g. the RfG requirements for FRT in Italy which are different for PPMs and SPGMs and for PGMs connected to the transmission or distribution level. Is not fully transparent is those cases and there is the risk of misinterpretation. Can we help to keep it updated to the required level?

Ioannis mentions that the file was made available together with the last year's Monitoring Report. Therefore, is not a file that ENTSO-E continuously updates. For this year's report (or whenever we have information to update) we will do so. Ioannis points out that the file (especially in the current format) cannot include all the different range of requirements and national variations for both transmission and distribution connected PGMs and also is very challenging to receive all this information from TSOs and DSOs. In the past and in similar discussions at GC ESC level, there was an invitation to DSOs to share their requirements/documentation at national level. A few only responded, so the information is of course not complete. Ioannis invites EUGINE and again all GC ESC members to share with ENTSO-E the shortcomings they observe and support the work and objective of the monitoring file.

The Chair asks whether ENTSO-E plans to have regular updates on the monitoring file even if it is now associated with the yearly Monitoring Report.

Ioannis replies that overall, the file should not be assumed as subject to frequent updates. The file includes final approved values/requirements at national level which in theory don't change often. However, to be sure that we do maintain an updated version, we can agree on ENTSO-E reviewing it once per year and in the meantime if updates are spotted by stakeholders, they can be shared as well. Jointly then, we keep the file as updated as possible.

The Chair points out that there might be some larger updates concerning at least the NC HVDC due to the fact that the national implementation was not finalized everywhere at the time of issuing the monitoring report of ENTSO-E and ACER.

The Chair also suggests that any specific information of national requirements that are hard to be incorporated to the monitoring file, can also be uploaded to the Active Library under each country and in the national documents section.

Ioannis agrees and also mentions that ENTSO-E will have another review of the current content of the Active Library and explore what more can be retrieved from the national experts.

Luca Guenzi (EUTurbines) mentions that this topic has also been debated within the the scope of topic 9 and the workshops that have been conducted by EUTurbines and VGB on certain amendment proposals. It will be mentioned again later on in today's meeting.

ACTION: DSO associations and ENTSO-E to review the question on "P=const behavior of some loads connected via power electronics" (line 86 in the Action Tracker) and assess the importance of the impact and the cross-border relevance.

ACTION: All GC ESC members are invited to share information with ENTSO-E to improve further the monitoring excel file and/or the Active Library with the national CNC related requirements/grid codes.

ACTION: ENTSO-E to review the monitoring excel file and the content of the Active Library and update where possible.

2. *CNC implementation – ENTSO-E updates*

Ioannis Theologitis (ENTSO-E) and Ralph Pfeiffer (ENTSO-E) present the slides (available here)

Eric Dekinderen (VGB) reacts on ENTSO-E's answer on the interaction studies point that was presented by Ralph and asks what to do with the costs of the studies and also if something needs to be modified in the HVDC system. The cost issue is the one of more importance. Is it that the TSO will study the issue and the relevant costs will be borne by the TSO or from the developer that has asked to make the study?

Ralph replies that the CNCs do not deal with such aspects – allocation of costs for studies. However, Ralph's states his personal opinion and says that such studies are usually within the context/scope of interaction studies that TSOs need to do in a wider area anyway and therefore doesn't believe that such studies should be seen as stand-alone studies that will require specific cost handling. The costs then can be assumed, being borne by the TSO.

Eric continues and asks if this this principle will also apply to any changes that need to be done to the e.g. HVDC system out of the results of this studies.

Ralph clarifies that he was only referring to the costs of the studies themselves. For any follow up costs out of the results of any study, Ralph says that is difficult to define a general rule on this. Matters are then site and project specific and can be handled in different ways with all involved parties.

Eric asks if this opinion is independent from the ownership of the HVDC terminal (TSO or third party).

Ralph states that his opinion has entirely the engineering perspective and is completely detached from commercial aspects and ownership of assets.

Mario Ndreko (ENTSO-E) complements the discussion and mentions that for HVDC NC, it is the new (latest) installation that connects to the system that bears the costs. When a new installation connects, and adverse interactions occur, the new installation is responsible for taking actions and adapt control schemes etc (not referring to costs). However, when it comes to a new PGM connecting this is still not defined on who takes actions, adapts control schemes and protection settings (again not referring to who bears the costs).

Eric mentions that if the study reveals that the HVDC needs to adapt when a new PGM is connected, then that should be done. Is not clear in the Regulation but this is clear in the study itself. Who bears the costs, this is indeed something that can be defined nationally or on project basis.

Mario concludes with a personal opinion that we may need to check if there is any equivalent of Article 29 of HVDC NC in RfG and clearly allocate responsibilities to those that come last to the system. Is not maybe fair to adapt the whole local system settings when a new PGM connects.

Eric says that is a problem of costs. From all the options that might exist to solve an issue the one of lowest cost should be chosen.

Mario says that indeed a CBA is sensible, but we need to have clearly the responsibility of who should act on the issue.

Ralph agrees with the CBA point and on top he adds that is also important for the existing users to be confident that they won't need to change and adapt their control/protection system everytime that a new party connects. An optimal solution needs to be found and then who will bear the cost is a parallel consideration.

Ton Geraerds (VGB) agrees with the statement from Ralph, pointing out that this is interaction phenomena and therefore one party should not be seen as the guilty one in comparison to the other.

ACTION: ENTSO-E to inform the GC ESC when the IGD on "Compliance Verification – Compliance Testing and Use of Equipment Certificates" and the respective replies to the public consultation feedback are publicly available (expected by mid-October).

3. *Assessment of RfG RoCoF values*

Eric Dekinderen (VGB) presents the slides (available here)

Ioannis Theologitis (ENTSO-E) says that ENTSO-E had the opportunity to assess the content of the presentation and remarks a few points in VGB's presentation:

- On the fact that in certain Member States that RoCoF values have unilaterally been selected by the TSOs, is hard to believe. The implementation process includes submission to NRAs, informal and formal public consultations and then a process for approval. Also, at ENTSO-E level, TSOs have coordinated the drafting of an IGD on RoCoF (which was separately consulted by stakeholders) with the intend to support implementation and to extend possible harmonize the values at synchronous area level. For the latter, the picture is much more positive than what the relevant table from the presentation implies – which present a high range of values when considering all synchronous areas together.
- On the frequency data from gridradar source: the data published by ENTSO-E (for the 24 July 2021 incident still to come) are of high quality and resolution (wide-area measurements) and are the results of dedicated work from all TSOs. Therefore, I would be very reluctant to trust such sources which could give an indication but not the reality.
- On the observed RoCoF value: the average value of 13 sec cannot be appropriate when values are expected to be calculated within 500 msec. How ENTSO-E calculates RoCoF and what assumptions are used in terms of accuracy of measurements, there are studies by System Protection and Dynamics (SPD) group available online.
- Last but not least is that is very risky to extrapolate from 1-2 incidents and result to conclusions on system needs and requirements. Those incidents are example cases where you can draw some conclusions, but we should not use them as reference for all needs. There can be more severe cases of system separations

Mario Ndreko (ENTSO-E) complements:

- The system split in January led to 6.3 GW imbalance in the North-West area where the load was 318 GW which is an imbalance of 2%. This is by far not the worst case we can have in Europe and Continental Europe where we can talk about 10% of imbalance and so on.
- About the centre of inertia and when we refer to 1 Hz/sec, you may have parts of the European system which may have much higher values. The Regulation should cover all cases and not only the centre of inertia.
- For the Iberian Peninsula incident, the slides mentioned 2.5 sec measurement window while if you check the 0.5 sec window then you could easily reach close to 1 Hz/sec. All bear in mind that LFDD was also activated so the situation was risky. Therefore, we cannot easily generalize from one incident or the other.

Eric clarifies that he mentioned average RoCoF values because he didn't have any other data available and agrees that you cannot rely to such large intervals to define requirements. The only thing that VGB wants to ask ENTSO-E is to clarify the method used to define the RoCoF because there is a concern whether the approach of the sliding windows is used and also if there are any intentions to harmonize that at synchronous area level and have discussions on what can be an acceptable RoCoF, because the current withstand capability of 2Hz/sec may be unacceptable for a lot of users.

Ralph Pfeiffer (ENTSO-E) states that to avoid any confusion in this discussion we need to differentiate between the approach to calculate RoCoF (incl criteria for measurement) and the initial RoCoF that can be observed is such incidents which is calculated by a mathematical formula using the physics/parameters of the system at that moment. RoCoF is proportional to the the imbalance and inertia and in order to conclude how critical a situation is, all three values should be assessed together. Therefore, is not recommended to extrapolate from one incident but on the contrary to investigate possible incidents of system split that could occur around Europe and examine the impact and the RoCoF that could result to.

Luca Guenzi (EUTurbines) mentions that in the past there have been considerable efforts to identify scenarios and the impact on RoCoF and what the time windows should be. That study that was done with manufacturers too concluded then to 1 Hz/sec but that was specifically for Ireland. The biggest imbalance checked back then was the loss of two lines with the UK. Luca mentions that there were also three workshops organized within the framework of this investigation and the TSO was asked to explain the strategy for keeping RoCoF under control, the target values etc. It became known then that Ireland has its own strategy to keep frequency under control and therefore explained why the specific RoCoF parameters are reasonable. The result from those workshops[1] was also that such strategy and target values is not apparent in Continental Europe.

Luca adds that the analysis was also based on single bus bar model analysis which is a simplified one. Therefore, as Eric mentioned, it is difficult sometimes to understand what is behind the selected RoCoF values and how those are being implemented at national level (as it was highlighted in the recent FGH report on RfG Implementation). The workshops also concluded (for Continental Europe) that there is no need to take any actions to keep RoCoF under control which doesn't match with the fact of high RoCoF being important for the future and the request for higher withstand capabilities. What we should still need to discuss is the target value for continental system and then how much more the withstand capability for PGMs should be.

The Chair replies to Eric's point on harmonization of measuring window, by saying that ACER cannot harmonize such matters, but can facilitate discussions. Taking into consideration what Luca said about the past workshops, the Chair recalls the the Article 39 of SO GL and the preparation of bi-annual dynamic studies per synchronous area to identify the minimum required inertia. In those workshops, ENTSO-E was requested to investigate on possible scenarios for system splits and possible system design parameters. The Chair then suggests that all these RoCoF aspects under such system split scenarios to be discussed in a dedicated workshop. ENTSO-E can lead the organization of this workshop when also these studies are prepared and are ready to be discussed, because useful comments can come from stakeholders as it has been the case in the past.

Ioannis says that the suggestion for the dedicated worshop is noted and in addition announces that ENTSO-E, acknowledging the importance of this discussion and the fact that there can be more severe cases of system splits, will present in the next GC ESC meeting some first results of a relevant internal investigation that has recently been conducted and currently being finalized.

The Chair asks whether we can have an indication for the workshop.

Ioannis replies that we need to coordinate first internally to ensure proper preparation and presence. Possibly end of this year or beginning of next one.

ACTION: ENTSO-E to present in December's GC ESC meeting results of their investigation on system splits and respective RoCoF obsrvations.

4. *GC ESC Expert Groups – Comments from GC ESC review, final reports and acknowledgement*

Criteria for Significant Modernisation (EG CSM)

Michael Wilch (EDSO) presents the slides (available here). Final Report here.

Eric Dekinderen (VGB) comments that by modifying/replacing the blades and/or low pressure turbine due to e.g. some cracks in those blades, you are upgrading at the same time the performance/the efficiency of energy conversion and therefore the active power increases by some percentage. Is that a significant modification?

Michael replies that it might be since you change/increase active power in this case, but then it depends on what the TSO has defined at national level and has been accepted by the NRA. If it 0.5% then according to Michael's view, it is irrelevant, but still the national implementation decides.

[1] Reference to the ENTSO-E stakeholder workshops on dynamic stability assessment and minimum inertia – Art 38 and 39 of SOGL – that were hosted 3 years ago.

Eric continues and says that since we do not propose ranges (min/max value), each country define own threshold values which may vary significantly and impacts the European level playing field.

Michael acknowledges that the risk for different thresholds across Europe exists, but with a proper TSO coordination across Europe this risk can be reduced and define similar thresholds at least per synchronous area.

Eric states that the EG CSM does not propose a range.

Michael confirms that statement and mentions that it was due to time limitations and also complexity of the discussion. The objectives of the EG have been largely met and results are very useful but of course not all open questions might have been answered.

Mike Kay (GEODE) adds that we don't know what to expect yet on this matter. Is better to give time to the national implementation to consider the thresholds based on own needs/discussions and then we can see if the thresholds e.g. those of active power require harmonisation at EU level.

Srinivasa Raju Addala (EUGINE) congratulates the EG and states the concern from manufactures' point of view that manufacture their products based on IEC standards. If you start implement different requirements and then the manufacturer tailors the product based on those requirements, this is time consuming and gets equipments and products more expensive. Do we need in the long run to have an alignment between the TSO,DSO and IEC standards?

Michael says that the EG hasn't derived any new qualitative requirements and it should be possible to fulfil those requirements with equipment compliant to IEC standards. Regarding the state-of-the-art references, in the report it is used to describe any equipment that can support/fulfil the CNC requirements. It is important to understand that for example, if one changes a controller in an installation (may not be assumed as modernisation) and then later on in time the whole installation is retrofitted, he cannot claim that the installation cannot comply with the CNC requirements because of the controller. Since he was aware of the connection requirements at the time he was changing the controller, he should have made sure to get one (or any other equipment) that can comply/support compliance with CNCs.

Raju understands the point, but he repeats the challenge of the manufacturing industry to produce products which are based on IEC standards and still need to fulfil grid codes – alignment of standards and requirements is needed.

Mario Ndreko (ENTSO-E) asks if we have a point-to-point HVDC connection and this expands to a multiterminal one, what is this classified? Have the EG discussed such cases?

Michael replies that the EG hasn't discussed such cases and most of the focus was spent on NC RfG. However, the first reaction would be whether this change to multiterminal implies change to the transmission capacity, so as to be able to classify it as significant modernisation.

Interaction studies and simulation models for PGM/HVDC (EG ISSM)

Mario Ndreko (ENTSO-E) presents the slides (available here)

Ton Geraerds (VGB) complements Mario and clarifies that the EG took the comments from the GC ESC review very seriously and most of them were accepted and incorporated into the report. However, there are a few comments that the EG decided not to implement and of course the right feedback and explanations needed to be provided. In the process of providing those explanations, VGB was asked to deliver some content to support the justifications and that was the point that we had more discussion and diverse opinions within the EG and the reason for not finalizing the EG report on time. Discussions are still ongoing, and we will need 1-2 more weeks.

5. *GC ESC Expert Groups – Comments from GC ESC review, final reports and acknowledgement*

Baseline for Type A PGMs (EG BfTA)

Florentien Benedict (CEDEC) presents the slides (available here)

Thomas Schaupp (CENELEC) comments about the statement that an EU wide certification scheme is missing and says that the respective statement from Florentien is not entirely precise. There is an EU wide certification scheme that is based on the Regulation 765/2008 which distinguishes several standards and defines the way of accreditation of the certification bodies and how to provide certificates. The certification scheme is EU harmonised at some level, but what we miss is actually a testing scheme with a standardised testing method.

Furthermore, Thomas mentions that the EG distinguishes between mandatory and non-mandatory requirements for the fault-ride-through (FRT). What is always challenging from his perspective with the titling mandatory and non-mandatory is what is mandatory for whom; sometimes it seems to be used in the NC RfG context that is mandatory for the TSO to cover a certain topic or is understood as mandatory for the grid user to provide certain functionalities. Similarly, for the non-mandatory: for the TSO to request or not the functionality or for the grid user to provide it or not.

Florentien replies that regarding the EU wide certification scheme, this can be explored by the new EG to be created on this topic. Regarding the mandatory and non-mandatory, it has been written in a way that reflects the capability of the PGMs. Florentien refers to slide 7 to clarify further.

Thomas says that this would mean that for SPGMs, they should be able to provide FRT but is not necessarily required to do so.

Ioannis Theologitis (ENTSO-E) adds that the interpretation is correct, but it should not be forgotten that at national level the non-mandatory EU requirement can be implemented as mandatory if approved by the relevant authorities. In this particular situation (FRT) we wanted to highglight that our concern was mainly to establish the behavior of the PPMs acknowledging that for SPGMs of that size the implications (cost mainly) are considerable.

Bernhard Schowe-von der Brelie (EFAC / VAZ (FGH) comments on the point from Thomas regarding the EU wide certification and remarks that the Regulation 765/2008 is not a certification scheme. The certification for equipment/products is the one from ISO 17065 but there is no international certification scheme for grid connection certification.

In addition, Bernhard wonders whether the chosen thresholds of 50kW really helps considering the current approved thresholds of A/B in the different Member States.

Florentien replies that the intention was to address those couple of cases where the A/B threshold was too low and ensure that in the future small PGMs until that threshold will be assumed as Type A, supporting the mass products without also burdening them with extra requirements stemming also from other Regulations.

Bernhard concludes that it is also surprising that there are no recommendations for reactive power control, since there are problems at lower voltages.

Mike Kay (GEODE) understands the point regarding reactive power and he adds that the EG worked on the direction to assess which requirements from Type B can be applied to Type A. If we look at the Type B requirements for reactive power control, they are very vague, so bringing them down to Type may not have a desired impact and anyway the RSO needs to specify those requirements in much more detail than what there is in RfG. Also to the extend that reactive power control / voltage control is needed, there are already local / national provisions defined and therefore putting something vague in RfG may not be necessary.

Eric Dekinderen (VGB) follows up on the comment from Bernhard on the thresholds and asks if there could be the case to raise this threshold to 100 kW if Slovenia and Italy will agree with it. He also asks about the different alternatives that are provided in some parts of the recommendations. Who will decide which one to follow in the amended Regulation? Is it the GC ESC, ENTSO-E, ACER or the EC? What are the next steps regarding the alternatives?

The Chair replies on the second question from Eric and says that the EG reports will be taken into consideration in assessing the proposals for the amendments for the CNCs. ACER is in charge in leading this process. Of course, these proposals will be submitted for public consultation and then a recommendation will be made to the European Commission which will decide whether to follow it or not and propose a different one.

When there are multiple proposals on the table, ACER will consult on them and try with the Regulators if possible to converge to one proposal before submission to the EC.

Florentien replies on the point regarding the thresholds that we have tried to get feedback from Italy and Slovenia during the work of the EG. We didn't receive a definite answer, but we understood that in Italy they need to consider small units as significant grid users (SGU) which assumes certain requirements coming from SO GL/KORRR and therefore the threshold is low.

Gunnar Kaestle [COGEN] expreses some concerns regarding the low thresholds and the reasons that those were chosen. At the same time, he acknowledges that the FRT is addressed in a good manner by the EG report and is an important requirement. Both alternatives could work from the system perspective. Gunnar also recommends that the report could be used to amend the EN 50549-1 in the next revision and change the "should" into "shall" when it comes to FRT – even if the NC RfG is not yet updated.

Florentien answers that the main reasons for the low chosen thresholds were the FRT and the SGU considerations.

Mario Ndreko (ENTSO-E) asks if the EG discussed what type of FRT capability will be requested i.e. the behavior of the FRT?

Florentien replies that the EG had also discussions on a possible FRT profile and is documented in the report.

Mario agrees that the profile is important and is also important to define the behavior of the unit during this profile. Does it only stay connected or provide reactive power too?

Florentien confirms that it hasn't been discussed in detail. Ioannis complements that the focus was only on the FRT as it is defined in the NC RfG which is detached from requirements on reactive current during the fault.

Mario asks if then the national implementation will define such behavior. Mike says that such provisions can be national. Mario mentions that this is understood but we need to pay attention to the fact that what PGMs do during FRT affect the system need so we should not neglect that.

The Chair wraps up the discussion on the existing EGs and repeats that only the report from the EG BftA has been provided on time and is publicly available. The one from EG CSM is final but not uploaded and the one from EG ISSM is almost complete. With regard to efficiently approve/acknowledge all reports by the GC ESC, the Chair proposes to approve them as a bundle but given that EG ISSM needs a couple of more weeks, the electronic approval might be appropriate after the report from EG ISSM is finished. Then we can give 14 days (2 weeks time) for acknowledgement, requesting from the members to react only if there are objections. Relevant communication can be organised by Ioannis.

The Chair makes an important clarification that the EG reports are not the final stage in the amendments process. In fact, it is the first one. It is the first input to inform the amendment process. Any alternative proposals and diverging views can still be communicated/submitted during the public consultation from ACER. Therefore, if members don't agree with everything in any of the EG reports, they will be able to raise their points.

Marc Malbrancke (CEDEC) asks whether we should acknowledge today the report from EG BftA since it was ready and uploaded on time.

Ralph Pfeiffer (ENTSO-E) asks the Chair what will mean if someone objects to the report and its publication. Will the report be published anyway, noting the objection?

In reply to Ralph, the Chair says that if the EGs fulfilled their mandate by delivering according to the ToR, either we agree fully or partially with the final report, we should not object to their publication or to parts of the reports. We can receive further feedback and also discuss it in December's meeting, but the publication of the reports should not be withheld.

Eric comments on the EG ISSM report and the fact that simulation requirements are defined for Type C and above, and he considers that they should apply to PPMs of Type A and Type B as well to avoid that each Member States defines each own rules. What does the GC ESC say about this?

Mario replies that in the ToR we refer to Article 16, but also he is not convinced that asking such requirements from hundrends of thousands makes sense.

Mike says that this is the current case (leave the work at national level) for all requirements in Type A; no harmonised approach to certification.

Eric suggests including that in the scope of the new EG. Ioannis agrees that this point belongs to that EG.

Michael Wilch (EDSO) says that the way forward is indeed as followed: harmonising first the requirements and then the simulation models.

Thomas adds that we don't need to define all the details in the NC RfG. From the CENELEC perspective, there are already international standards and procedures available which are well used in various countries. Standardisation can support the harmonisation that is requested and don't need to harmonise all details in the Regulation. Thomas invites the stakeholders that see any needs for such harmonisation to communicate them to CENELEC.

Eric asks whether Thomas supports to include a provision to the Regulation for Type A and Type B but referencing the link to EU standards.

Thomas replies that he has no knowledge about requests for simulation needs for Type A. Only for Type B and above (at least in Germany). International standards are used as reference in that case.

The Chair comes back to the suggestion from Marc to approve the EG BftA report. **No objections were raised, and the report is acknowledged and approved for publication**. The GC ESC congratulates the Chair and the members of the EG BftA for their success.

The Chair reminds to the EG Chairs that when there are diverging views at EG level, those could be documented in the report before submission. This is a solution to be considered.

ACTION: As soon as the remaing EG ISSM report is finalized, Ioannis will send both CSM and ISSM final reports to the GC ESC for a 14-day period of acknowledgment. The GC ESC members will be asked to raise objections only.

6. *Preparations – survey assessment for establishing future EGs*

Ioannis Theologitis (ENTSO-E) presents the slides (available here). Survey results are found here.

Eric Dekinderen (VGB) comments that European Commission has launched a call for experts for a working group on offshore grids. Do we envisage any collaboration between this group and the new EG on the topic? Because we may risk producing conflicting reports

Elaine O' Connell (EC) replies that indeed the call was issued for a working group on offshore renewables but in terms of content, it is not expected to have overlaps with the GC ESC EG. The working group's focus will be more high-level covering supply chains and value chain overall. However, for transparency reasons Elaine recommends establishing some cross-reporting from one group to another (frequency to be defined). The EG is expected to focus on HVDC NC and possible amendments and in the EC working group some of HVDC cable manufacturers are interested to participate. What would also be interesting for the EG's work is to utilise the industry's expertise from the EC's working group when and if needed.

We have good examples of such collaboration from the past when working on EG STORAGE.

Ralph Pfeiffer (ENTSO-E) highlights that for the GC ESC EG, a first stage is proposed which will be more of scoping exercise to identify the areas to further focus on and the expertise needed. Under this workplan, we can assess the establishment of links with other relevant groups as the one from the EC.

Elaine supports the approach, and she will help facilitating the links with the EC working group.

Elaine in reply to a comment raised through the chat

7. *Draft ToRs/Annexes from the new three prioritized EGs*

Ioannis Theologitis (ENTSO-E) explains that for today's meeting the experts that have suggested the topics that have been prioritised for the new EGs, prepared draft ToRs (usual 1-2 pages format) to initiate the discussions within the GC ESC. The ToRs have not been widely consulted and after the meeting we will schedule a period of time for GC ESC members to share their feedback together with nominations for being members in the EGs.

Expert Group: Identification of connection issues for offshore systems (EG Offshore) – tentative title

Ioannis presents the draft ToR (available here)

The phase 1 – phase 2 approach was proposed as discussed earlier by Ralph Pfeiffer (ENTSO-E). The current ToR aims at focusing on scoping the existing work and identify the specific objectives that phase 2 can tackle. In conjunction with this, the needed expertise can be invited and relevant collaborations with other groups can be established.

Vasiliki Klonari (WindEurope) asks how short the period of phase 1 would be.

Ioannis replies that tentatively the ToR includes a time of 3 months with some flexibility depending on the scheduling of the EG meetings and kick off.

Vasiliki asks whether we will have two separate calls for phase 1 and phase 2.

Ioannis replies that probably the core membership will be defined already in phase 1, but we can upgrade it as soon as we identify the objectives of phase 2. It is likely that further or/and different expertise will be needed. There will be a call for members from phase 1.

The Chair asks whether interoperability aspects will be tackled within this work or not.

Ioannis replies that interoperability will be part of the existing/parallel relevant work to consider. ENTSO-E with certain stakeholders has been quite active on this field over the last two years and discussions should be utilised when of relevance

Mario Ndreko (ENTSO-E) adds that the focus in this EG is to identify the connection requirements needed and what we miss from today's Regulations. Interoperability is a wider and still open topic with no conclusive work yet. However, we can have the channels of communication open.

Luca Guenzi (EUTurbines) asks whether we should add an explicit reference to this ToR regarding the potential link with the working group from the EC as described before.

Ioannis replies that we could try to list exhaustively all the relevant groups and reports to be assessed but this is in fact the work of this phase 1. So explicitly or not such link will take place.

Expert Group: Harmonization of Product Family Grouping and Acceptance of Equipment Certificates in European Level – tentative title

Freddy Alcazar (EUGINE) presents the draft ToR (available here)

Florentien Benedict (CEDEC) recommends for the new EG to consult on what has been done so far (also discussions within EG BftA). Also some legal expertise may be beneficial for the work. That was the main challenge BftA had and couldn't conclude with proposals about CE marking etc.

Mike Kay (GEODE) complements what Florentien has already said, mentioning that EG BftA had a lot of discussions on compliance and certification aspects and may be helpful that a small group of experts from BftA could join the new group to ensure continuity. Mike overall supports the content of the ToR but mentions that it may be challenging to achieve all objectives, although timeframes have not been discussed yet. On specific remarks to the ToR: the title might need further consideration since it implies that Equipment Certificates (EqC) exist already which is not particularly correct.

Ralph Pfeiffer (ENTSO-E) requests clarifications regarding the term "product family grouping". Do we mean products that can be covered by the same certificate?

Freddy replies that yes, that should be the understanding. However, he reminds that this is also the objective of the EG, to define clearly what a product family would be and why it could be taken into consideration for the certification of multiple units. Similar to what is done in Germany and is proposed in Spain and Italy.

Bernhard Schowe-von der Brelie (EFAC / VAZ (FGH) comments on the "product family" notion and says that the main issue is not only that there is only one certificate but is also relying one one testing so you don't need to repeat the test with all the "members of the family".

Bernhard continues and asks whether EN 50549-10 will be considered in this EG. It will worth including this as a separate point.

Freddy replies that for sure this standard will be considered. It does only cover Type A and Type B but still it will be considered.

Bernhard then suggests including another milestone for existing schemes in testing across EU Member States.

Freddy agrees.

Luca Guenzi (EUTurbines) asks if the EG will eventually consider component certificate e.g. in big PGMs can be the AVR and the associated validated models or components outside the generating unit itself e.g. supervisory system etc. That could be interesting for the scope of the EG.

Freddy replies that as a first priority the focus will be on equipment certificates which includes the whole unit, AVR etc. This will be the scope to start with but of course things may change according to the discussions in the EG and the interest of the members.

Ioannis Theologitis (ENTSO-E) mentions that ENTSO-E has reviewed the draft and some comments have been prepared. Those comments will be sent after the GC ESC meeting for consideration. Main points that have been highlighted are: 1) consider DC NC and HVDC NC in the scope, 2) make more specific objectives and deliverables so as to reach realistic results, 3) consider existing work that has been done and discussions that have been made, 4) not everything should be tackled through the Regulation and certain objectives/tasks fall under the standardisation work.

Freddy replies that indeed this is a draft proposal so far and the target/objectives will need to be rationalised and specified according to the timeline.

Assiet Aren (EUGINE) welcomes all comments and indeed the idea is not to cover everything. Assiet uses the example of the FRT that is defined differently in every country to say that this is the main issue we want to tackle – requirements that are not harmonised and to have the acceptance of the testing/certification results from one country to others. FRT is one striking example, but we should check what tests and for which requirements can be common to each country.

Mario Ndreko (ENTSO-E) mentions that EG ISSM has looked at simulation requirements and invites the new EG to check the report/results produced especially if you define compliance verification based on those models.

Thomas Schaupp (CENELEC) agrees with Bernhard that 50549-10 should be included in the scope of this EG. Regarding the comment from Mike that we don't have EqC today, Thomas says that we do have them all over Europe, even in GB according to G99 AND G98. The problem from the manufacturers' perspective is that we have specific testing procedures, documentation needs and certification processes in each country that increases the effort quite a lot.

Mike replies that there are many self-declarations of compliance from manufacturers but not certain that those have the legal status of EqC. If Thomas has more information about this, then it will be useful if he could share with members.

Expert Group: Advanced Grid Services and Controls for Grids with High Penetration of DER – tentative title

Thorsten Buelo (SolarPoower Europe) presents the draft ToR (available here)

Elaine O' Connell (EC) points out that the scope of the ToR is quite broad and market focused, so we need to make sure and be clear on what the outcome should be – if it is on the technical capabilities or the market. Elaine acknowledges that the work of this EG is very important and could be useful to align with the work of another group that is working on potential amendments on Demand Side Flexibility (also more market focused). A bilateral follow up should take place before we finalize this ToR and ensure that work aimed here has not already been done in another group. Same consideration for the needed expertise. Overall, we need to make sure that we target connection codes and if there are additional questions, we can channel them to the demand side flexibility group.

The Chair agrees with Elaine regarding the focus of the current draft which seems to be rather market oriented and certainly not in line with the focus of the GC ESC. However, it would be important to ask the system operators to say what the future system needs would be or what characteristics will be needed and then how those should/could be delivered by the capabilities of the system users (engineering approach). Upon that, we could discuss on how to facilitate markets to deliver what is required once the capabilities are available.

Thierry Vinas (EURELECTRIC) asks about the point in the ToR "to explore minimum requirements to be delivered by generators". Is it meant, by all generators? SPGMs and PPMs?

Thorsten replies that the focus is on PPMs, but in cases we discuss that even the SPGMs may not be adequate to address all system needs or that we need to consider possible interactions with existing/new SPGMs, so in a way they enter into the focus.

Michael Wilch (EDSO) agrees on what has been said so far. He remarks that the methodology includes reviewing or starting from what has already been done at EU level but is a good idea to start better with Member States and investigate what has been done in terms of such requirements at national level. Then we can derive what is needed to be harmonised at EU level. That gives us the certainty that at least there is experience with such requirements.

Thorsten replies that from his perspective indeed there is not much experience on such aspects, not much knowledge that we can utilise from Member States, however the EG will certainly seek for existing information from Member States (e.g. regulatory approaches) or/and relevant other groups. Regarding the technical specifications and system needs, there have been already enough things discussed and documented and we don't need to repeat the work, but check for updates and shortcomings.

Thorsten gives a general statement regarding the market notes from the ToR and says that the intention was to see whether certain of those needs can be delivered by the market and not necessarily to discuss about market structures.

Michael reacts and mentions that from his perspective the fact that there is not much experience at national level on such requirements, where national specificities could have revealed the need for them, is an indication that we don't need to work at EU level yet.

Thorsten clarifies that experience is not large but there is some and things progress fast. There is also a common acceptance to the fact that we will need such requirements in the future.

Mario Ndreko (ENTSO-E) agrees that this EG should start from where th technical group of high penetration ended. There the system needs were identified and what is more, the report argued that a new class of PPMs with specific capabilities should be present in the system. Now this EG should take those capabilities and explore putting them in the context of the Connection Codes (amendments). It is also important to discuss the dynamic performance of such PPMs and the technology readiness with regard to the capabilities defined. Mario mentions that market is out of scope.

Luca Guenzi (EUTurbines) comments on the point regarding "development of requirements" and says that we need maybe to differentiate on what can be a default capability and what a service. The definition of capability is important since some aspects may be "capability of performing a logic" or something such as capability for reactive power which are different things. It has a different impact when considering redesigning the unit vs extending it with some components and then being compensated by a market.

Thorsten comments that the EG should elaborate on where we need mandatory or default requirements and where not and we can rely on other solutions (or services).

The Chair reiterates that we should make a clear distinction between capabilities and services. Only capabilities are within our focus. If we want to talk about non-mandatory requirements that can be defined at EU or national level within the framework of a service provision, then this is OK, but the focus remain on defining the requirement as such.

Thorsten agrees.

Gunnar Kaestle [COGEN] supports that previous statement that the focus of this EG should be on inverters or PPMs. Any interaction phenomena could probably be dampened by other features.

Vasiliki Klonari (WindEurope) agrees with Mario and Thorsten that we need to continue on the work that we did in the past, but is this group only for grid forming capabilities or of wider scope? Vasiliki also adds that this EG should define the necessary capabilities no matter if they will be mandatory and for whom or they will be treated as services at the end. Today, in different countries there are different ways of defining/understanding what is a capability and what is under remuneration scheme.

Mario supports what Vasiliki mentioned.

Ton Geraerds (VGB) comments that after defining the requirements, it is also important to consider how you can meet them before burdening more the generators. If the needs should be delivered by the capabilities of generators, then we should pay attention to the Article 1 of NC RfG that mentions that only capabilities shall be required where appropriate use is made of them.

Ralph Pfeiffer (ENTSO-E) says tha the approach to the scope is still unclear, do we narrow it down to grid forming or we target all PPM requirements? One may seem narrow but the second is also too broad and we should not re-write all matters and those that are not questioned.

Mario says that if we start from Class 3 PPMs as defined in the report of High Penetration, then this will lead us to the conclusion we want. If we want to name this grid forming or not, is another topic.

Regarding next steps of the process to finalize all the ToR of the new EGs, Ioannis suggests allowing two weeks for further comments to the drafts since not all of them were ready on time. After that, the current leading associations can consider changes and finalize the drafts within a week's time.

In parallel, since the content/objectives of each EG is largely known, we can also launch the call for members for three weeks. The above plan will bring us just after mid-October with final ToRs to communicate to the GC ESC and then kick off the work.

The timeline is agreed and Ioannis will communicate the plan in a separate email to the GC ESC members.

Vasiliki Klonari (WindEurope) asks whether the ToRs will be sent immediately for comments.

Ioannis replies that he will send the drafts after the meeting. If for any EG(s) more time will be needed to incorporate comments then we can afford some additional time.

ACTION: Ioannis to inform the members about the timeline for finalizing the new EG ToRs. That includes two weeks for additional comments from the GC ESC members and one week for leading organisations to assess and incorporate the comments. In parallel a call for EG members will be launched for a period of three weeks.

8. *CENELEC updates – Work Program of TC8X WG03*

Thomas Schaupp (CENELEC) refers to the slides presented last time (available here). The work continues with the scheduled mentioned in the slides.

9. *Joint EUTurbines – VGB proposal "Connection Network Code Amendments – the necessity of procedurual improvements"*

Luca Guenzi (EUTurbines) presents the slides (available here) and the work done in collaboration with VGB.

Due to lack of time, the Chair proposes to have a feedback session or any comments on this presentation in our next GC ESC meeting.

ACTION: GC ESC members to review the slides from EUTurbines on "Connection Network Code Amendments – the necessity of procedural improvements" and prepare any comments (if any) for the next GC ESC meeting.

10. *AOB*

No AOB points.

11. *Follow-up actions:*

1. DSO associations and ENTSO-E to review the question on "P=const behavior of some loads connected via power electronics" (line 86 in the Action Tracker) and assess the importance of the impact and the cross-border relevance.
2. All GC ESC members are invited to share information with ENTSO-E to improve further the monitoring excel file and/or the Active Library with the national CNC related requirements/grid codes.
3. ENTSO-E to review the monitoring excel file and the content of the Active Library and update where possible.
4. ENTSO-E to inform the GC ESC when the IGD on "Compliance Verification – Compliance Testing and Use of Equipment Certificates" and the respective replies to the public consultation feedback are publicly available (expected by mid-October)
5. ENTSO-E to present in December's GC ESC meeting results of their investigation on system splits and respective RoCoF obsrvations
6. As soon as the remaing EG ISSM report is finalized, Ioannis will send both CSM and ISSM final reports to the GC ESC for a 14-day period of acknowledgment. The GC ESC members will be asked to raise objections only
7. Ioannis to inform the members about the timeline for finalizing the new EG ToRs. That includes two weeks for additional comments from the GC ESC members and one week for leading organisations to assess and incorporate the comments. In parallel a call for EG members will be launched for a period of three weeks.
8. GC ESC members to review the slides from EUTurbines on "Connection Network Code Amendments – the necessity of procedural improvements" and prepare any comments (if any) for the next GC ESC meeting.