Ref: GC ESC10-02

10th Grid Connection European Stakeholder Committee (GC ESC)

Monday,11 June 2018 from 12:30-18:00
ACER, Trg Republike 3, Ljubljana 1000, Slovenia

Draft Minutes

Participants			
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Ton	GERAERDS	VGB Powertech	
Thomas	LESCARRET	EURELECTRIC	
Jan	RASMUSSEN	EURELECTRIC	
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Eleni	DIAMANTOPOULOU	ClientEarth	Via webstreaming

1. Opening

1.1 Welcoming address and Draft Agenda

The GC ESC Chair Uros Gabrijel (ACER) welcomes the participants to the 10th GC ESC meeting. The agenda is approved, with an additional item from ENTSO-E under AOB on the topic of NC HVDC.

1.2. Review and approval of minutes from previous meeting

The minutes of the 9th GC ESC meeting are approved (available here).

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

1. Action 1: *ENTSO-E will provide updates on the creation of the EGs under agenda item 4.*

***2. Action 2: Joint SO-GC ESC**: Regarding the question on measurement precision of the frequency and the definition of insensitivity in SOGL and NC RfG, additional clarifications on the outstanding issues will be provided at the joint SO-GC ESC session on 12 June under agenda item 3.*
***3. Action 3:** ENTSO-E should send a request to start the process for the standard regarding max voltage in 400kV networks to be amended on behalf of the ESC. IEC has been contacted and the issue was explained. Formal submission will be done through the relevant ENTSO-E WG. The ESC will be kept informed.*
***4. Action 4:** The question whether TSOs would accept the same type of equipment they use in operating their systems to be owned by generators will be addressed under agenda item 5.*
***5. Action 5: Joint SO-GC ESC:** The question on whether SO GL provisions can be imposed on batteries will be explored through the EGs that will be established.*
***6. Action 6: Joint SO-GC ESC:** ESCs will be updated regarding any updates of the consultation overview under agenda item 5 of the joint SO-GC ESC on 12 June.*
***7. Action 7:** The topic on substantial modifications will be addressed under agenda item 6.*
***8. Action 8:** Stakeholders should inform the EC if they notice some divergencies between the English version of the NCs and the translated version into national languages. The EC fill follow-up on any such notifications received. The action is ongoing.*
***9. Action 9:** ENTSO-E will present its considerations and responses to the questions raised by VGB under agenda item 3.*
***10. Action 10:** To raise the awareness, the ESC members should inform the MSs and NRAs of the uncertainties of application for the mass products PGMs after 17 May 2018 and of possible solutions. The ESC is to follow the unfolding of this issue. The action is ongoing.*
***11. Action 11:** The question regarding the interpretation of NC RfG Article 6.4 and how it applies to cogeneration has been logged in the issue logger. ENTSO-E will provide its response as part of the answers to VGB questions under agenda item 3.*

The Chair concludes with the agreement of the GC ESC members that it would be beneficial to setup an excel list to facilitate tracking outstanding/open items from the GC ESC meetings. ENTSO-E will create this list and make it available on the ESC platform.

The Chair reminds of the ToR's provisions concerning meeting preparations and prompts everyone to submit meeting presentations at least 1 week ahead of each ESC meeting.

2. Connection Network Codes implementation: Update from Expert Groups and Forward planning for activities in 2018

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. During stage 1, the group focused on Fast Fault Current Injection (FFCI) to develop initial guidance for use at national level ahead of issue of national documents; during Stage 2 (2017 – 2019), the group is focusing 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 topic can 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.

Garth Graham (EURELECTRIC) notes that regarding CM and the issue of equipment standards, the UK NRA has published a related decision saying that the RfG requires equipment certificates to be used for mass market generating modules, but noting that at present there is no process for creating such certificates. He wonders which stakeholder group should be looking at the process and procedures for introducing the certificates. If there is no process for creating the certificates, how can it be ensured that the process is put into place. He thinks that elements created in the EU should be applicable in the entire EU.

Ioannis Theologitis (ENTSO-E) takes note, and explains that equipment certificates were addressed in an IGD (available here). There is also an ongoing discussion with CENELEC on this topic, as it is an open point to which extent equipment certificates are covered.

Jan Rasmussen (EURELECTRIC) explains from a Danish perspective, for type A generators something else then using certificates can legally be done, while for type B and above they will need to make an on-site compliance test if they do not have a certificate.

Garth Graham (EURELECTRIC) understands that certification is relevant for all types of PGMs, but an equipment certification process doesn't exist, so he wonders what and who can take steps to ensure equipment certificates can and will be developed at some point. The UK NRA says that at present there is no process for creating certificates.

Marc Malbrancke (CEDEC) supposes that the EN 50549-10will need to be issued first to provide the basis for creating those certificates. The process will be created by bodies that make the certificates based on a standard which would supposedly prove that if one has a certificate coming from that standard, then it is indeed in line with the RfG.

Luca Guenzi (EUTurbines) notes that normally first standards are established, then a procedure through different parties that provide certificates is established, and they follow the relevant specifications. For the EN 50549-10, there is ongoing work addressing small units. The intention is to address the mass market with actions. CENELEC is also checking if this is extendable and to which extent it can provide a procedure.

Garth Graham (EURELECTRIC) notes that there would be differences between parameters of general application and of site-specific application for different types of generators. He wonders if there are benefits by having equipment certificate for reducing competitive compliance testing to avoid testing every time by the manufacturer. If a generator has an equipment certificate, then he can pass it to the network operator and no compliance testing would be needed for that while for larger generators, some site-specifics may apply additionally. He is keen to understand how things are developing with a view to getting a process on this across the Union as the GB NRA is saying there is no process for creating these certificates across the Union. Garth's reading of the equipment certificates is that if he has an equipment certificate, then under the RfG he could also use that certificate across the Union, which is why it is of concern that there is no process yet for creating equipment certificates across the Union while it would be beneficial to ensure that wherever the equipment certificates are created in one country in the Union, they could be applicable across the Union in other countries too (for example a Slovenian equipment certificate to be used in Italy without the need for getting an Italian equipment certificate while people want to be able to use the equipment certificates everywhere).

Ralph Pfeiffer (ENTSO-E) explains that from a DE point of view, the national implementation connection rules have defined extensively what should be the context of equipment to be accepted in Germany, what should be in the certificate, but it is not obligatory to issue the certificate by a German certifier; it can be issued by any accredited certifier according to Regulation (EC) 765/2008 and the certificate can be issued anywhere as long as it has been issued by an accredited certifier and the content fulfils what is requested by national implementation rules. For example, for Italian equipment certified by a Slovenian testhouse, to be applicable in Germany, the certificate should fulfil German national requirements on the content of the certificate. If the Slovenian testhouse fulfils this for the Italian equipment, then it will be fine.

Michael Wilch (EDSO) explains that there could be a two-fold solution: there is a need for an accredited certification body and accreditation is a process which is harmonized across Europe. However, every certification body can have its own process for certifying something so long as the technical requirements for the equipment are taken into account. If a manufacturer wants to sell only in the German market, then the certification body has to certify by using the German set of parameters needed for national implementation in Germany. If selling in the entire European market, then the range of parameters as given in the NC RfG should be used, with testing min/max for each parameter to see if it passes. If a general European certification is required, one needs a confirmation that all national parameters needed are set as they are required at national level. There is a possibility for a European-wide valid certificate, but then one needs to show they can set the parameters as it is required in the national regime where the generator will be used (as in the case of the German example). In the German case, one needs to have a certificate to show it fulfils the German national requirements, then showing to each system operator (SO) that he fulfils the parameters as given by the SO.

Garth Graham (EURELECTRIC) notes that there could be a danger with equipment certificates if there are different understandings. The result could be a difference in application across Europe. It also seems there could be a marketing advantage if there is the possibility to test only once for certain parameters and elements but to be able to use that certificate across Europe for this specific set of parameters.

The Chair invites Bernhard Schowe-von der Brelie from EFAC to provide a presentation at the next GC ESC on the topic of equipment certificates and to address the questions raised in the discussion.

Jakub Fijalkowski (E-Control) inquires regarding the harmonization of the processes, how will accreditation standards be met? The intention is to avoid similar issues as observed with the cars, where in Malta it has been easier to get homologation of cars as opposed to other places. It has to be looked at how to avoid potential disturbances in the certification process.

3. RfG – addressing the questions from VGB

Ralph Pfeiffer (ENTSO-E) provides answers to the questions raised by VGB at the 9th GC ESC (slides available here).

Regarding the FRT specifications, Ralph Pfeiffer recommends to refer to the existing ENTSO-E Implementation Guideline for the NC RfG available **here** (items 3.5 and 3.9).

Regarding the question on how to understand CHP exemptions in industrial sites, ENTSO-E recommends to refer to the discussion at the 9th GC ESC meeting (available **here**) on how generation in industrial sites could be classified based on connection points. Article 6.4. applies to generators, excluding type D. ENTSO-E considers that the generator should be classified according to its connection in an industrial site, and the generator would remain type B or C based on the connection point even if total site is connected at type D (e.g. a PV installation on the roof).

Luca Guenzi (EUTurbines) explains that the Article 6.4 formulation is not clear as to whether/when the article applies in case the industrial site is not covered currently by the national code, as it is not explicitly stated in it how the cogeneration units should deal with the reduction in active power while it is also said that all generation unit should follow type A, B, or C, etc. There are some national codes where cogeneration is not addressed at all and there is no explicit indication in the codes as to how active power has to be dealt with for cogeneration plants. He asks for a confirmation whether Article 6.4 applies to all those plants.

Ralph Pfeiffer (ENTSO-E) explains that as it is stated, Article 6.4. is a default unless something else is defined at a national level in which case that would prevail.

Garth Graham (EURELECTRIC) explains that from a legal point of view, if the text says, "where otherwise stated in the national framework," it could be understood as whatever was in the national framework, if it was there when NC RfG was approved, back in 2016; another interpretation is post-2016 when the NC RfG was approved, if something wasn't in the national framework, then it is put here and it has to be applied. The first interpretation might be legally better - some countries might have something stated in the framework in 2016, and that was in the mind of drafters when developing the code.

The Chair concludes that some unclarities remain and the question is not fully addressed at this point. The ESC agrees to check national translations related to this article and to ask the EC to provide their view on this question.

Michaël Van Bossuyt (IFIEC) notes there seems to be a level-playing field issue as there are different text understandings in different countries on this: in BE there are lots of discussions as the TSO has a different interpretation to this, and wants to ask for type A and B derogations; however, for type C, no derogations can apply. Ralph Pfeiffer (ENTSO-E) explains that national examples are different and some divergencies may be observed. Further clarity is needed on this aspect, but that may be also tackled under the EGs to be established.

Regarding the VGB question on why there are differences between adjacent TSOs on the thresholds for the classification of PGMs which have to be coordinated with adjacent TSOs, Ralph Pfeiffer (ENTSO-E) explains ENTSO-E's interpretation that coordination should not be understood as harmonisation to equal values. As explained in the IGD on selection of national MW boundaries, the rationales for choosing thresholds are shared by adjacent TSOs but can lead to different threshold values (e.g., depending on the generation mix in each country).

Srinivasa Raju Addala (EUGINE) points out that from a manufacturer's point of view, this means different things across various MSs, and the lack of harmonization regarding thresholds is costly and time-consuming.

Garth Graham (EURELECTRIC) recalls recital 3 of NC RfG on the harmonization[1] of rules and that coordination between 2 adjacent TSOs can be seen not as separate numbers but as moving towards something and coming together closer, so there is a recognition of coordinating and harmonizing, even if not identical.

Klaus Oberhauser (VGB) agrees coordination is good. The experience in national implementation as he has seen is that surrounding TSOs have different approaches - some looked at different parameters, chose different types of class, others chose something similar to their neighbors' choices.

Regarding the question on the period of time to withstand simultaneous voltage and frequency deviation, Ralph Pfeiffer (ENTSO-E) explains that if a TSO makes use of Article 16.2.a.ii**,** in case of simultaneous deviations of frequency and voltage the shorter time period of each should be applied unless specified otherwise by the relevant TSO according to Article 16.2.a.ii as recommended by the IGD on frequency ranges. It is not mandatory to respect IEC standards when making such specifications, because of the legal hierarchy between the NC RfG and IEC standards.

Jan Rasmussen (EURELECTRIC) thinks there is a need for some kind of justification in case of deviation from the requirements from existing technical standards; as it is stated in the NC RfG, one has to consider existing standards and technical specifications.

Ralph Pfeiffer (ENTSO-E) explains he does not know if it has to be justified, but normally others would expect to understand the motivation behind any such process.

[1] NC RfG recital 3: Harmonised rules for grid connection for power-generating modules should be set out in order to provide a clear legal framework for grid connections, facilitate Union-wide trade in electricity, ensure system security, facilitate the integration of renewable electricity sources, increase competition and allow more efficient use of the network and resources, for the benefit of consumers.

Garth Graham (EURELECTRIC) asks regarding Article 16.2.a.ii, as the TSOs have to specify this by 17 May 2018, if a TSO hasn't specified in the MS, then this doesn't apply.

The Chair notes that regarding specification of proposals made by TSOs and the status of TSO proposals to NRAs/MS, as reflected in the Active Library (AL) and the monitoring spreadsheet, is of December 2017 and asks about when new updates can be expected in the AL.

Ioannis Theologitis (ENTSO-E) explains the AL file includes the most recent information on RfG thresholds and further information on HVDC is expected as well. The file is updated on a continuous basis as ENTSO-E receives information, and the file shows the latest available status. Items in the files which have status below 4 (approved) can be subject to further update/changes in the national context.

The Chair concludes that it would be beneficial if the AL and monitoring file would contain information concerning the time of the input/update of data.

Garth Graham (EURELECTRIC) inquires about the procedures for changing a value by RfG in case the TSOs have specified a value, and whether a TSO can change it and how often at a later date in case they want to change it. It is expected that it would be much more difficult to harmonize if values are allowed to constantly change. He would like to know what happens if the 2-year deadline has passed and the TSO has not specified a value, and whether the TSO is allowed to change the value once specified, as well as how such procedures are followed upon and transparently.

Marc Malbrancke (CEDEC) explains that Article 7.7 gives a possibility to make changes, and there is a process for doing so.

Ralph Pfeiffer (ENTSO-E) confirms that an approval is needed on such changes as no TSO can change anything at its own discretion only.

The Chair concludes that this information should normally be collected and presented in the monitoring and the Active Library. The monitoring file can be a vehicle to keep track of potential changes to the national requirements and updated links to national implementation processes give stakeholders a possibility to react efficiently to any consultation and to follow the progress.

Regarding the question on Article 18.2.a on reactive power, Ralph Pfeiffer (ENTSO-E) explains it is correct, that the reactive power capability should apply at the grid connection point. The relevant SO may specify reactive power to be compensated if the power generating module is connected by a line or cable to the connection point. It is important to identify who is in charge of the reactive power losses. The reactive power should compensate the reactive power demand or production of the line or cable and shall be provided by the responsible owner of that line or cable.

The question related to ENTSO-E's monitoring role regarding RfG will be sent to the EC for a response.

Ton Geraerds (VGB) thanks ENTSO-E for the responses to the questions and will take them back to VGB's members for discussion. He finds it challenging that sometimes different TSOs use different interpretations and there is no legal clarity.

Ralph Pfeiffer (ENTSO-E) reminds that the answers provided are given as ENTSO-E opinions and guidance. However, there may be divergencies across countries. ENTSO-E is not in the position to provide legal certainty on these issues.

4. Creation of new EGs – selection of topics and organization

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, ENTSO-E has chosen 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 as relevant for an EG and as proposed 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 work of the EGs on storage devices and pump hydro should be coordinated between the two to account for interlinkages. The aim will be to keep flexibility as to how the EG meetings are organized (back-to-back with others, web meetings and conference calls, etc.)

Ton Geraerds (VGB) asks how to ensure that other items than those raised by ENTSO-E are considered too in case they might require EGs in the future to be tackled.

Ralph Pfeiffer (ENTSO-E) explains the priority issues for EGs at this stage have been selected based on the results of stakeholder discussions and the survey. Those issues that don't lead to an EG at this time could be tackled in a next sequence of EGs or new issues can be added as needed. The same exercise can be used in the future for the selection of new topics for EGs.

Thomas Lescarret (EURELECTRIC) thanks for the initiative, agrees on separating the two SO and GC topics, and supports VGB that the ToRs should include a methodology to select topics to be studied as priority in the future and inquires as to how the additional topics as raised by associations will be treated. The ToRs should include a methodology to debate on how to prioritize the topics, including additional ones.

Ralph Pfeiffer (ENTSO-E) explains that there will be dedicated ToRs for each of the EGs, including the objective, content, deliverables, timing, etc. ToRs should also indicate when an EG is dissolved. ENTSO-E reminds that some topics can be addressed through the issue logger, or might be worth exploring through a workshop or a brainstorming session as opposed to through the creation of a separate EG. All of these channels can be used in parallel as deemed useful.

The Chair reminds that the EGs will be established under the GC ESC and they cannot drift away from the mandates given by the ESC. Any new topic that is introduced later will have to be defined as a priority to be tackled by existing EGs or by new EGs based on a decision of the ESC to create such a group if needed. An efficient process is needed to tackle additional topics as proposed by members which were not taken at this stage for the EGs. The proposal is to start with the outcome of the existing poll by establishing and then maintaining that list where new topics can be further added over time. The primary focus is on the ToRs of the 3 EGs to be established. Then an efficient way is to be found to replace an EG once it has concluded its work and for new EGs to be setup.

Garth Graham (EURELECTRIC) notes that on storage, there is a risk of committing resources to an EG now while the CEP is still under discussion and has not entered into force yet, so it might be a lost opportunity if an EG on storage is set up now. He wonders if it is better to tackle another topic for the third slot now and check with what the EC recommends on this.

Jakub Fijalkowski (E-Control) reminds that if the EC takes the storage topic and asks for an NC on storage, ACER will need to prepare guidelines within 6 months, then the work will start but an EG and its input would be useful in that context too.

Regarding future amendments to the RfG, Ralph Pfeiffer (ENTSO-E) notes that it is too early to decide on what will be part of proposals for amendments to the RfG, which is why an EG is to help with guidance on whether a topic can be proposed as an amendment in the future. As per the Regulation, any stakeholder can introduce ideas about amendments to the NCs.

The Chair reminds of Article 11 of the RfG on stakeholder involvement; the Agency and ENTSO-E shall organise stakeholder involvement regarding the requirements for grid connection of power-generating facilities, and other aspects of the implementation of this Regulation and to identify problems, etc., which provides a possibility for discussing in the ESC certain improvements to the codes. If the ESC thinks an EG is needed for a topic, the ToRs of the ESC allow for this.

Ton Geraerds (VGB) points out that certain questions which were asked were not yet taken up so he recommends having a list of those where stakeholders can add to and the ESC can pick based on that list for the next EGs as needed.

The Chair underlines that the ESC will be informed of the progress of the EG and will decide on its termination as appropriate. Regarding the topics, once it is known that a new EG can be established, ENTSO-E will be asked to make another survey on the list of potential topics. Also, ENTSO-E should maintain a list of all proposals received. This means that the topics that were not selected for the first 3 EGs, at this stage, will be kept in the list uploaded to the ESC folder. The list will be used as a basis for consideration and selection for topics for future EGs whenever needed through a similar survey with stakeholders on the prioritization. Not all proposals seem to fit the purpose of EGs, therefore, contributors to the survey can also provide their input as to how to tackle those topics. For example, some of the topics raised can be addressed through direct answers, some through workshops with experts, etc., minor topics/issues can be addressed through the issue logger, the Active Library, and at ESC meetings.

Michael Wilch (EDSO) notes the DSOs would be interested to co-chair some of the EGs if they cover topics which are heavily affecting the distribution systems; DSOs want to show active involvement, moreover considering that most of the equipment is connected to the DSO grid. The role of the chairs/vice-chairs must be recognized in the boilerplate.

The Chair clarifies the process and timelines to follow for the creation of the EGs: nominations by the members of the ESC for the 3 EGs should be sent to ENTSO-E by 29 June. The experts nominated for the EGs should send their input on the scope and boilerplate within a week (by 6 July). ENTSO-E will draft the ToRs including the inputs, organize preparatory calls for discussion with each EG at the end of August/beginning of September for finalizing the draft ToRs and submit these for approval at the next GC ESC meeting in September.

5. Equipment for temporary operation at voltages greater than 420kV

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 RfG compliance (e.g. demonstrated by tests, even if such tests are not covered by standards).

Ralph Pfeiffer (ENTSO-E) explains that 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 it 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).

Thomas Lescarret (EURELECTRIC) asks whether it is allowed in some countries, ex. France, for some transformers/equipment owned by generators to not be compliant with the NC RfG.

Ralph Pfeiffer (ENTSO-E) explains that declared compliance is needed so it is not possible to use equipment which is not compliant, as far as NC RfG is applicable to the TSO as well as a user. The NC RfG defines functional requirements.

Jakub Fijalkowski (E-Control) reminds that the NC RfG requirements concern new 400 kV TSO transformer units and not the upgrading of old ones. Therefore, in the next 5 years, the equipment concerned is primarily TSO equipment because of the system extension.

Klaus Oberhauser (VGB) notes that 400 kV may also apply for pump-storage, existing equipment and some lines. The problem is that the equipment is standardized, and if they have to build a new power plant on this, the generator has to state he is responsible or to install 500kV equipment.

Michael Wilch (EDSO) explains that even if transformers can be used for at least 60 years, there are always some that get old and once the TSO has decided they might experience such high voltage in the system, they would have been obliged to have same transformers that can withstand that in the future. He explains that system operators don't have a choice and need to have the new equipment as being responsible for the system security and so they have to ensure that all equipment can withstand risk situations.

Ralph Pfeiffer (ENTSO-E) explains that NC RfG does not specify equipment but defines functional requirements in terms of technical capabilities of power generating modules. Both SO GL and NC ER define operational requirements, which make use of these technical capabilities. The SOGL requirements are set up to fulfil the TSO needs to achieve under normal operating conditions, but there may be faults/incidents in the system, which the TSO needs to manage based on a system defence plan, so both the TSO equipment and also the equipment of connecting users matters.

Garth Graham (EURELECTRIC) notes harmonization means the generator is supposed to harmonize the equipment – this implies TSOs and DSOs will harmonize their equipment too and that should avoid the need to have too many types of specifications.

Michael Wilch (EDSO) explains there are lots of IEC standards used for the DSO so it might be worth the effort to have an international standard on the TSO side. Certain ranges are given by the TSOs, in a similar manner as for generators; and it varies depending on whether there is an existing connection point, while standards are being harmonized across.

Garth Graham (EURELECTRIC) notes that new connections are covered by DCC, for a DSO asset, the standard is set by TSOs for the connection to the TSOs.

6. Substantial modifications - ACER

The Chair provides an update on substantial modifications. ACER has discussed the examples from the 9th GC ESC meeting with the NRAs. It was agreed that ACER will develop guidance on best practice on substantial modifications, however, there are interdependencies with the banding affecting national choices on substantial modifications. Therefore, ACER will first monitor the ongoing implementation to understand these interdependencies. Any other examples from other MSs or revisions of practice remain welcome.

Garth Graham (EURELECTRIC) explains that regarding substantial modifications, the GB NRA issued a decision on Article 4.1.a.3, applicable to all connection codes. The NRA is proposing that they would not decide, in cases where the plant owner and the TSO agree. Article 4.1.a.3, requires NRA decisions, relevant for DSO and TSO assets – to ensure that the impact on consumers is considered and that the right arrangements are ensured. He thinks that even if the TSO and HVDC, or DSO, or the generator agree between themselves, the NRA should issue a decision, otherwise there can be an issue of customer dissatisfaction and to avoid unintended consequences.

The Chair recommends that the ESC is kept informed of the developments if the issue is raised with the NRA.

Beyond the implementation monitoring, ACER needs to understand how the regulation is being implemented and the links (banding, how the individual facilities are treated) etc. All these are yet to be implemented at MS level, and could be looked at either separately or holistically. ACER will check how the implementation is going and what the interaction with modifications that come on top is. No guidance is expected before mid-2019.

ACER will be creating a common repository for national decisions on derogations, which will soon be ready and will provide insights as to the implementation of the banding, definition of non-exhaustive requirements and treating of substantial modifications, as they all constitute the national implementation and have to be looked at holistically. NRAs agreed also to upload to the repository their derogation criteria.

Garth Graham (EURELECTRIC) notes that visibility would be very important for stakeholders to help them if they are looking to make investments/change plants. There will be an impact if the NRA already approved something on this aspect so it is important to have a view as soon as a decision is made or is expected to be made in order to be able to compare across NRAs as well and to challenge them if some differences on the application are found (also regarding the application of DCC). The Chair will take back to the NRAs the ESC recommendations.

Michaël Van Bossuyt (IFIEC) notes that if a modification in a site is treated as a substantial modernization in one country and not in another, there is no level playing field. It is not clear what a substantial modification is in various countries. A similar issue is related to single user sites under the DCC, not only mixed sites.

Thomas Lescarret (EURELECTRIC) reminds that there are different needs across countries and also exhaustive and non-exhaustive requirements in the NC RfG.

The Chair reminds that there will be an EG created to tackle questions related to mixed customer sites and how the NCs are applied in these cases. Significant modifications are not a stand-alone issue and first an understanding is needed as to how the NCs apply in different countries. The EG might come up with a clear message on how the mixed customer sights should be treated. ACER will be looking into these processes and closely follow the implementation. **Stakeholders are invited to bring relevant examples on substantial modifications they are aware of to ACER.**

7. Standardisation progress – updates and work on EN50549-10 on Compliance

David Spillett (CENELEC) provides an update on the standard EN 50549-10. The WG3 met in Frankfurt on 25-26 April with the EG CM. Part 10 is a fundamental document to enable the compliance process to work and to have a standard that can be applicable for testing equipment across Europe. Experts from ENTSO-E and CENELEC had very good discussions. Parts 1 and 2 of the standard are actually issued by MS at national committees, voting is closing on 11 July. The expectation is that those documents would pass, and then be implemented in MSs. Part 10 is the key document where one can demonstrate compliance and testing houses processes. For GB, as there isn't a process, manufacturer information and certificates for compliance are being accepted to ensure compliance. A number of items are on the list in the document, including chapters on the assessment to power specifications, frequency operation rates, rate of change of frequency requirements, power quality, short-circuit, electromagnetic compatibility, remote information exchange etc. A European consultation on the early drafting took place in 2016 on a pre-RfG type testing document, and the comments received were taken into account. Work is ongoing to get the document ready for committee draft consultation. The next meeting of WG is on 3 July and a WG meeting to finalize the chapters is expected for mid-September.

Garth Graham (EURELECTRIC) inquires, given the obligations on type A PGMs, whether CENELEC developed a test specification for type A PGMs so that manufacturers can test their generators.

David Spillett (CENELEC) explains that parts 1 and 2 of the standard dealing with MV and LV are relevant for these tests.

Thomas Lescarret (EURELECTRIC) notes that some compliance testing can be done for small units. The EN 50549-10 is for compliance of the entire type A and type B PGMs, not for one component only, but for the entire unit. Some of the parameters can be set and some of them not.

8. Implementation issues

Already addressed in the discussions earlier.

9. AOB

Ralph Pfeiffer (ENTSO-E) presents several questions by ENTSO-E on the confidentiality of data and models related to the interaction between HVDC systems or other plants and equipment and relevant studies as performed to mitigate adverse interactions (slides available **here**). ENTSO-E wonders if it is allowed and compliant with confidentiality obligations according to Article 10 of the NC HVDC, that a TSO submits confidential data and models, he has obtained from a system user, to a connecting HVDC system owner, who is in charge of a HVDC system interaction study according to Article 29.2; and questions on rights and obligations of system users, whose data are to be forwarded, to refuse data submission through the TSO, in particular if the receiving party is a competitor of the sending party; on how the obligations of TSOs to preserve confidential information can be reconciled with the need to connect grid, which obligations should take precedence, and if there is a hierarchy between confidentiality obligations and obligations according to the NC HVDC, among others. Ralph Pfeiffer (ENTSO-E) explains that currently what the TSOs do in such cases is to invite the relevant parties for the study to find an agreement on data to be exchanged and used (mainly through aggregated models to act as a black box to avoid intellectual property issues), but still issues remain as to the model. ENTSO-E has looked at these questions from a legal perspective, but could not find a conclusive answer.

Garth Graham (EURELECTRIC) notes on a case by case basis, Article 10.4 should apply – if a party receives the confidential information and uses it for another purpose than the one agreed, then that party has breached the law.

Michael Wilch (EDSO) explains that DSOs face similar worries with wind turbines and performed studies themselves, based on available information from academics on dynamic behaviour, and using models from ABB, Siemens, etc. to simulate details. Encrypted or compiled models can also be used so long as it is ensured that the model is detailed enough regarding invertors as defined by the SO for use in the system.

Ton Geraerds (VGB) notes there are black box models, but another possibility is to take a 3rd independent party for the required studies to sign confidentiality agreement with the other two parties which do not want to share their models, and to avoid confidentiality and competition issues.

In conclusion, the questions will be taken to the EC to provide an answer.

Next meeting dates

The location of the September ESCs is to be confirmed (ACER or ENTSO-E) if space allows as per the request of several GC ESC members.

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

10. Follow-up actions:

1. ENTSO-E will create a list to track outstanding/open items from the GC ESCs and make it available on the ESC platform.
2. Bernhard Schowe-von der Brelie from EFAC should provide a presentation at the next GC ESC on the questions raised regarding the processes for equipment certificates and accreditation.
3. Regarding the application of Article 6.4 of the NC RfG to cogeneration units, the EC is asked to provide their view on the interpretation of the article. The ESC members shall also check national translations of this article.
4. ENTSO-E's monitoring file on the status of implementation should include information as to the time of the data input/update. The Active Library should collect and include information regarding any, also ongoing, updates/changes to values specified at national level to help keep track of potential changes to the national requirements over time.
5. The question related to ENTSO-E's monitoring role regarding the NC RfG will be sent to the EC for a response.
6. Nominations by the ESC members for the 3 EGs should be sent to ENTSO-E by 29 June. The experts nominated for the EGs should send their input on the scope and boilerplate by 6 July. ENTSO-E will draft the ToRs including the inputs, organize preparatory calls for discussion with each EG at the end of August/beginning of September for finalizing the draft ToRs and submit these for approval at the next GC ESC meeting in September.
7. ENTSO-E should check the proposals that came from stakeholders for the past survey on the EG topics, provide feedback on how those topics have been dealt with or if they remain open, and create a list of topics which not yet resolved and/or were not selected for the first 3 EGs at this stage, and keep it in the ESC folder as a reference pool for any such surveys in the future.
8. The ESC should be kept informed of the developments regarding the GB NRA question on the NRA decision procedures if the issue is raised with the NRA.
9. Stakeholders are invited to bring relevant examples on substantial modifications to ACER.
10. The questions on HVDC studies and data confidentiality by ENTSO-E will be taken to the EC to provide an answer.