

Report from the Expert Group 'Mixed Customer Sites with generation, demand and storage and definition of system users' (EG MCS)

Robert Wilson, Chair of EG MCS

13th Grid Connection European Stakeholder
Committee Meeting

21 March 2019, Brussels

EG MCS structure

Expert group: Mixed customer sites with generation, demand and storage, and definition of system users (EG MCS)

Approved by the GC ESC on September 14, 2018
Subject to possible updates on the list of members

Chair: ENTSO-E, Robert Wilson

Vice-Chair: Paul de Wit, CEDEC on behalf of DSO Associations

Problem Statement

On 11 June 2018, the Grid Connection European Stakeholder Committee (GC ESC) decided to establish an Expert Group (EG) to clarify the requirements on mixed customer sites (MCS), where these could be a combination of generation, demand and/or storage facilities. The creation of this EG was proposed by ENTSO-E to elaborate on connection network code (CNC) issues which had been raised by stakeholders during CNC implementation. The ENTSO-E proposal was based on the findings of a stakeholder survey to identify priority topics.

Target (objectives)

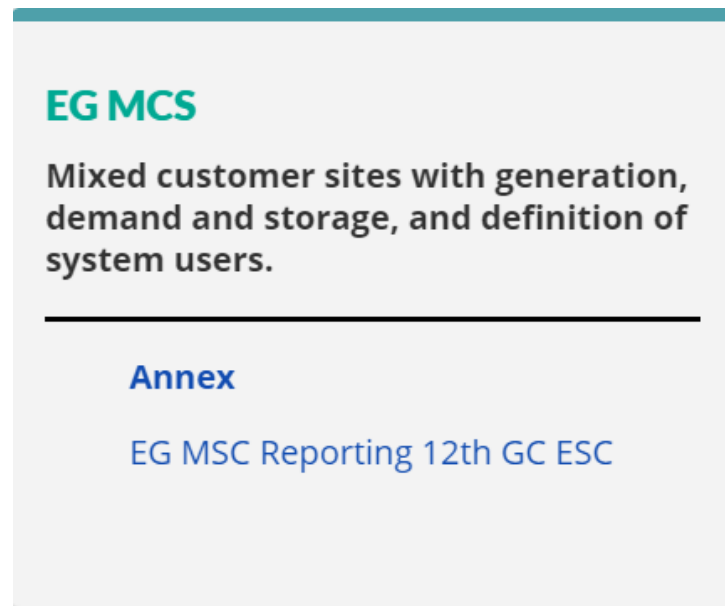
The objectives of the EG MCS are:

- to provide clarification regarding the application of the Network Code on Requirements for Generators (NC RfG) Demand Connection Code (NC DC) and HVDC (NC HVDC) to MCS with generation, demand and storage (to the extent that storage might in future be classed as separate from generation or demand);
- identify differences and similarities of mixed customer sites which are CDSOs and non-CDSOs;
- in the context of MCS:
 - o assess types of MCSs to be considered;
 - o to assess the MCS case against the current definition of system users, found in the Directive 2009/72/EC;
 - o to review the definitions of Synchronous Power Generating Module (SPGM)/Power Park Module (PPM); and
 - o to provide clarification in terms of the type A-D categorisation or applicability of RfG for mixed or novel sites addressing cases such as:
 - mixed generation only sites where a small PGM (e.g. PV) is installed within the connection site of a larger generator;
 - small PGMs connected to a ≥ 110 kV network due to unavailability of lower voltage connection points
 - combined heat and power generating facilities connected at ≥ 110 kV (where type A-C would be excluded from certain RfG requirements)
 - clarification on arrangements for point of connection to TSO, DSO or CDSO if that will determine the voltage of connection and therefore 'type' *(point added after the*

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Public space



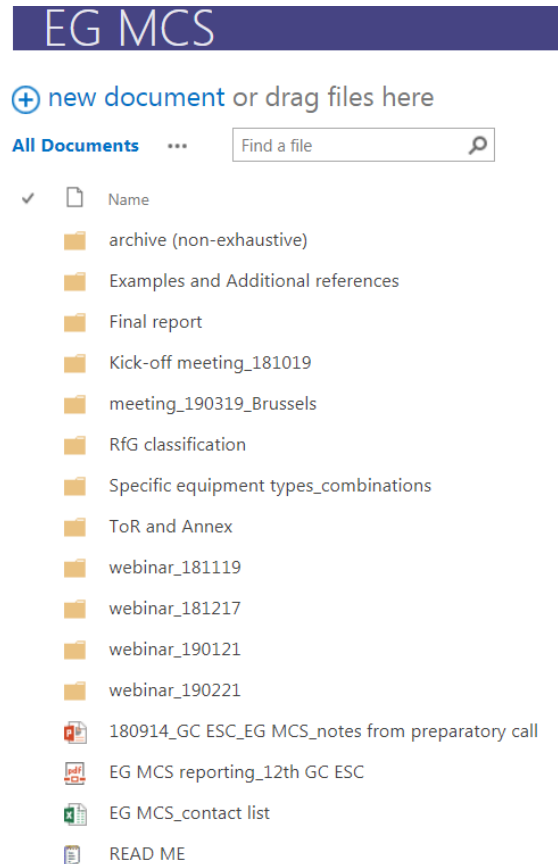
EG MCS

Mixed customer sites with generation, demand and storage, and definition of system users.

Annex

EG MSC Reporting 12th GC ESC

Internal EG space



EG MCS

+ new document or drag files here

All Documents ... Find a file

- ✓ Name
- archive (non-exhaustive)
- Examples and Additional references
- Final report
- Kick-off meeting_181019
- meeting_190319_Brussels
- RfG classification
- Specific equipment types_combinations
- ToR and Annex
- webinar_181119
- webinar_181217
- webinar_190121
- webinar_190221
- 180914_GC ESC_EG MCS_notes from preparatory call
- EG MCS reporting_12th GC ESC
- EG MCS_contact list
- READ ME

EG MCS meetings



- 19 October 2018 kick off meeting
- 19 November 2018, webinar
- 17 December 2018, webinar
- 21 January 2019, webinar
- 21 February 2019, webinar
- 19 March 2019, meeting
- **20 March 2019, joint EGs meeting**
- 09 April 2019, webinar



- 39 listed members (+6 since the last reporting)
- 16 different representative organizations (+2 since the last reporting)
- ~40% participation of members in meetings (dropped by close to 20%)
- >75% participation of organizations (dropped by 15%)



- Overall good collaboration among the active members, with good discussion over a complicated topic
- Common space (SharePoint) and emails are used to provide inputs
- The Expert Groups aims at finalizing the work beginning of May to be submitted to GC ESC in June's meeting

Examples of 'Mixed Customer Site' issue

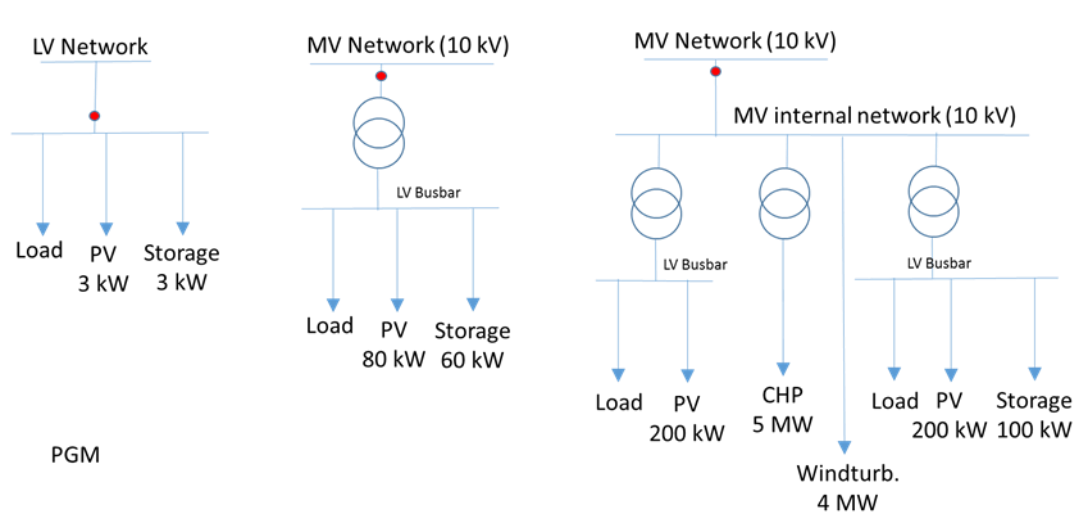
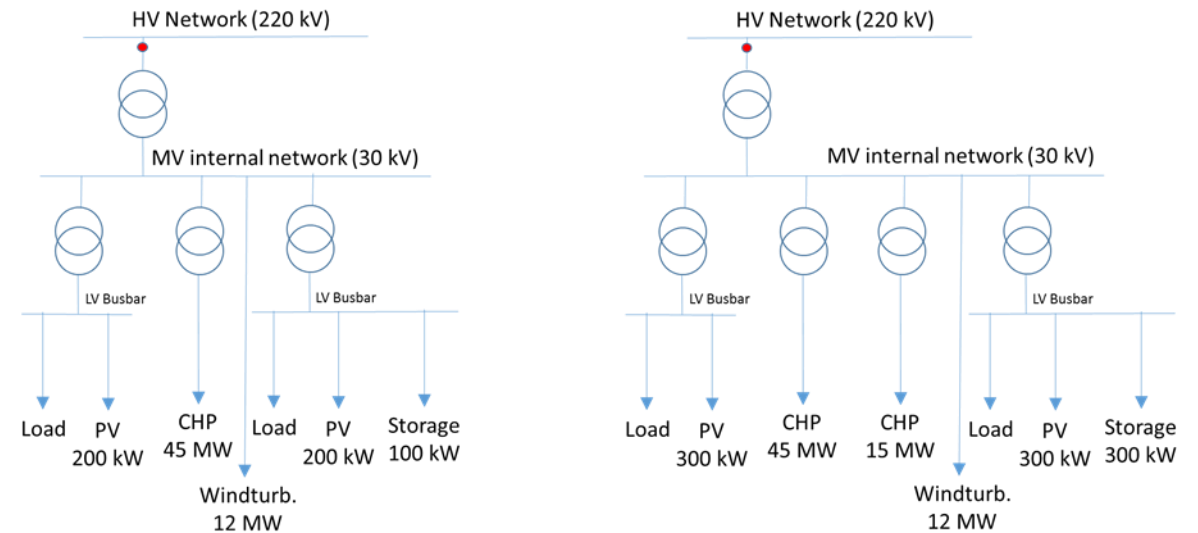


Fig 1(a) & (b) & (c) Mixed site connections to LV and MV networks .

Each of these generators is assessed as type A-D on the basis of their size



Figs 2 (a) & (b) Mixed sites connecting to HV networks via internal (= private) MV

Each of these generators is assessed as type D since their connection point to the system is at > 110kV

• Connection point at the network of DSO or CDSO

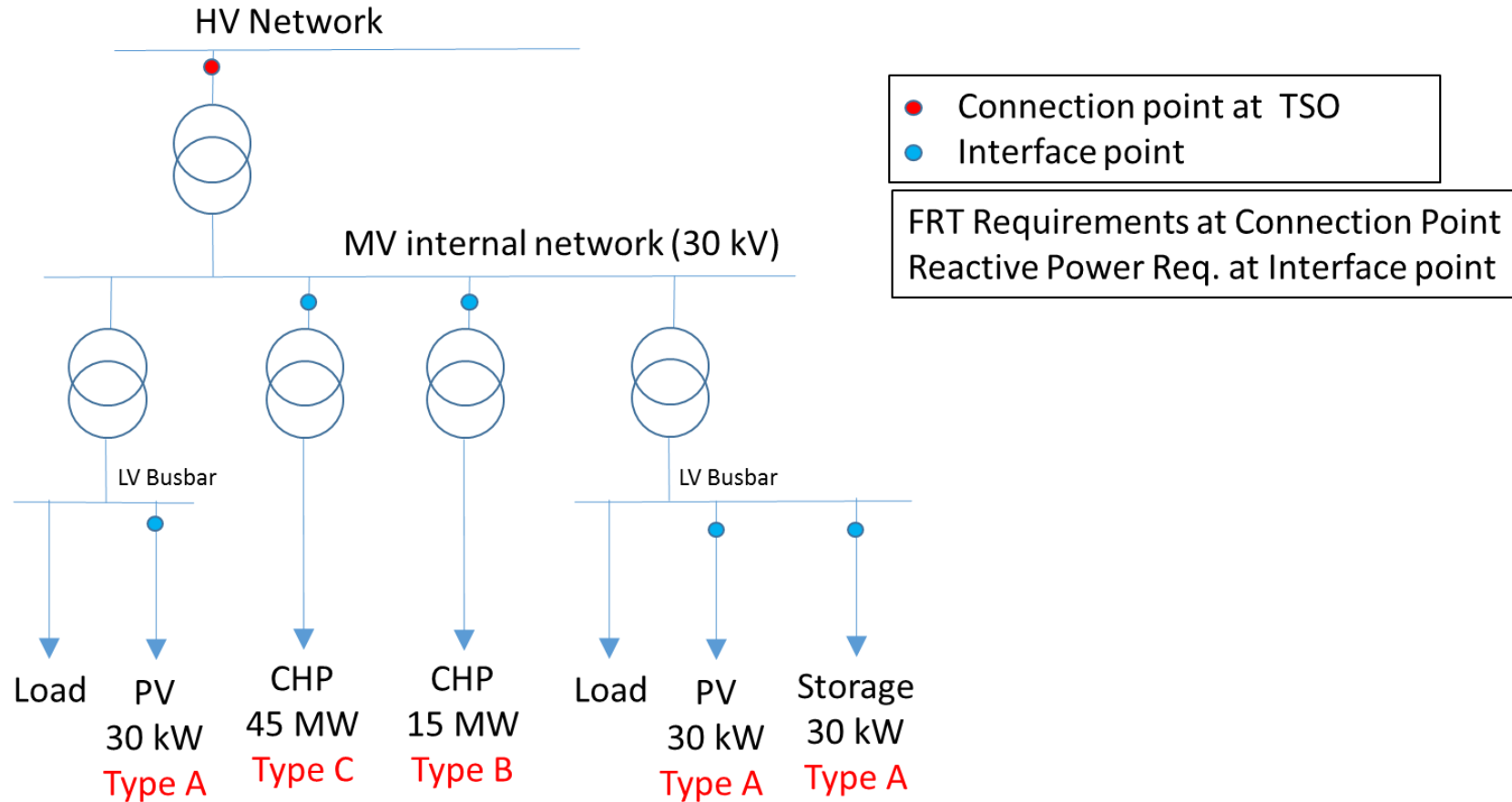
Possible solutions discussed in the EG

- Acknowledgement that RfG 'type D' voltage default was not perfect but during the drafting of RfG had been the best option available.
- In line with the ACER [FWGL](#) to take account of the connection voltage - on page 8:
'The minimum standards and requirements shall be defined for each type of significant grid user and shall take into account the voltage level at the grid user's connection point.'

Options considered:

- Define additional 'interface point' to determine all connection requirements (except fault ride through); or
- Define additional 'interface point' just to determine the connection voltage and therefore type
- Increase voltage criteria to be >220kV; or
- Remove voltage criteria from type A generators (so determined by capacity only); or
- Remove voltage criteria from type A & B generators; or
- Remove voltage criteria completely so for all of types A-B-C); or
- Removal of voltage criteria from type A, partial removal of increased RfG requirements for type B generators (on capacity) where defaulted up to type D on connection voltage

Interface Point illustration



Each of these generators is assessed as type A-D on the basis of their size if against their interface point but type D if against their connection point

Advantages and Disadvantages

Voltage Criteria Solution	Pro	Con
Use interface point for all	<ul style="list-style-type: none"> Treats public/private networks identically Solves issues with supply of reactive power across connection point 	<ul style="list-style-type: none"> Visibility of performance within a network to TSO/DSO Establishes an additional legal boundary Doesn't solve geographic availability of LV/MV issue Reverses established legal arguments around requirements applying at the connection point to the system Encourages connection at lower voltages and independent operation (no collective control)
Use interface point – for type selection only	<ul style="list-style-type: none"> Maintains visibility of performance to TSO/DSO By generally leading to reclassification, reduces technical requirements for smaller generators 	<ul style="list-style-type: none"> As above (except visibility within a network to TSO/DSO) Doesn't solve reactive range issue
Change the default criteria to >220kV	<ul style="list-style-type: none"> Simple – minimum change to RfG 	<ul style="list-style-type: none"> Doesn't resolve issues with transmission connections constrained for geographic reasons Doesn't solve case where a major industrial site is connected at 220kV+. (Examples of this in Germany and in Belgium for CHP plant)
Remove voltage criteria from type A generators (so type A determined by capacity only)	<ul style="list-style-type: none"> Resolves all type A scenarios Solves obligations in the SOGL imposed for type A PGMs connected at >110 kV 	<ul style="list-style-type: none"> Some reduction in network support Will incentivise connections to keep within capacity for type A Discrimination between types A & B
Remove voltage criteria from type A & B generators	<ul style="list-style-type: none"> Resolves all type A/B scenarios 	<ul style="list-style-type: none"> Some reduction in network support Will incentivise connections to keep within capacity for type B Discrimination between types B & C
Remove voltage criteria from type A, partially remove from type B (some type D requirements retained where defaulted up to type D by connection voltage)	<ul style="list-style-type: none"> Seeks a compromise in reducing impact for smaller generators and retaining more network support from type B by size 	<ul style="list-style-type: none"> Complicated solution Possible discrimination between types A, B and C Feels similar to a derogation for type B
Remove voltage criteria completely so for all of types A-B-C)	<ul style="list-style-type: none"> Simple in principle Resolves all cases 	<ul style="list-style-type: none"> May be viewed as significant change to RfG – loses link to ACER framework guidelines in no longer considering voltage Reduction in network support would lead some TSOs to reassess 'type' thresholds

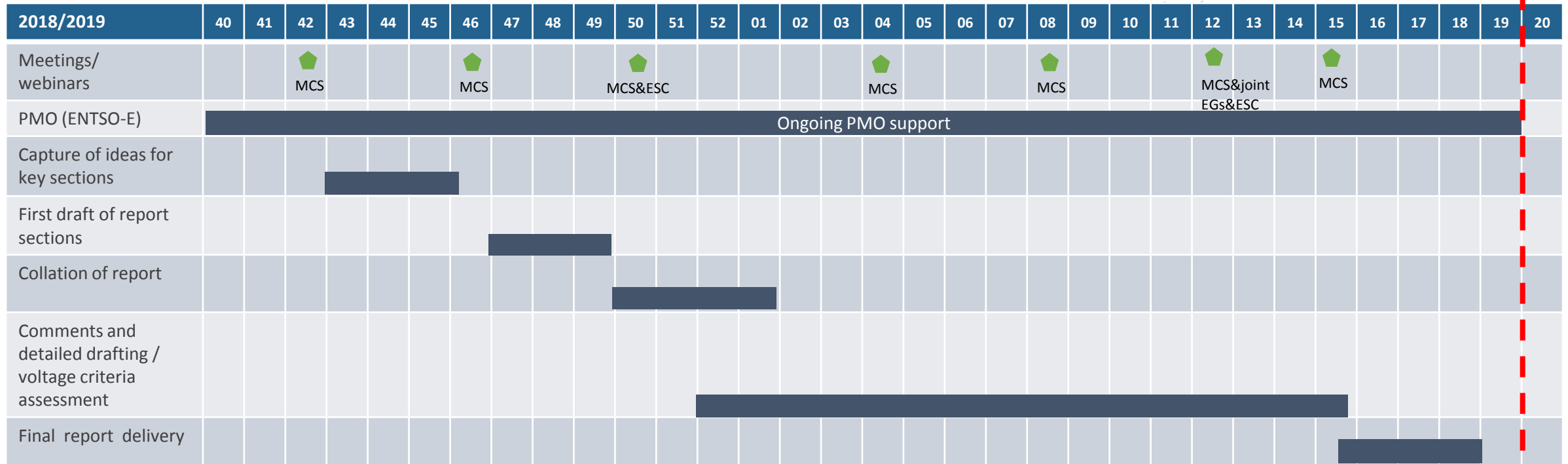
Acceptability...red lines

- Generators:
 - Would like to see voltage criteria removed completely
 - Want to at least address type A & B issues
 - Support interface point in concept
- TSOs:
 - A reduction in support will lead to increased operational costs. Needs to be balanced.
 - Removal of voltage criteria completely would lead some TSOs to revise 'type' thresholds
 - Don't support adding another legally complex boundary (interface point)
- DSOs
 - Don't support adding another legally complex boundary (interface point)
- Industrial sites/CDSOs/CHP parties
 - Increasing voltage threshold to 220kV doesn't work
- Manufacturers
 - Want as simple a solution as possible
 - Prefer greater harmonisation and removal of national specificities
 - In some cases can't comply with type D requirements for smaller plant

Preferred Solutions

- Removal of voltage criteria (for all of types A-C)
- Removal of voltage criteria for A & B
- Interface point

Workplan and Next Steps



- The EG will work on completing the acceptability assessment and finalizing the report in the meeting in April
- The EG will come to conclusions where possible
- In April's meeting, all comments will be addressed (deadline for comments by 2 April)
- The format of the final report will be aligned with the rest from the other EGs
- The EG will submit the report to the GC ESC for publication