



The voice of the European generating set industry



EUROPGEN Contribution to NC RfG Amendment Proposals

25th October 2022

Key Items for EUROPGEN Members



Four main themes were highlighted by EUROPGEN in the policy paper consultation:

1. Determination of significance of PGMs

- a) Inconsistency of SPGM definition
- b) Application of voltage criteria

3. Harmonisation of types B, C and D PGM requirements

- a) Fault ride through boundary conditions

2. Demonstration of compliance

- a) Harmonized certification acceptance
- b) Product family grouping

4. Simulation models and compliance monitoring

- a) Simulation software
- b) Use of modeling to demonstrate compliance

Two additional items were raised during recent working group discussions

5. Cyber security

- a) Clarification of minimum requirements applicable to SPGMs

6. Improvements to the applicable rules and procedures

- a) Use of English as a second language / translation of national implementations

Determination of Significance of PGMs



a) Inconsistency of SPGM definition

Issue: There is **significant inconsistency** on how determination of significance is defined for SPGMs.

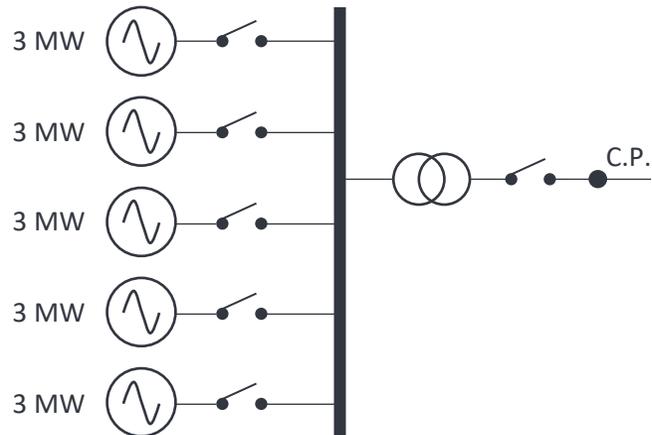
In some national implementations the type classification is defined based on the individual unit rating, whereas in others it is defined based on the aggregated capacity of the facility.

This results in **disproportionate requirements** for SPGMs relative to their individual effect on the overall system.

Determination of Significance of PGMs

a) Inconsistency of SPGM definition

Example: Power generating facility with 5x 3MW SPGMs

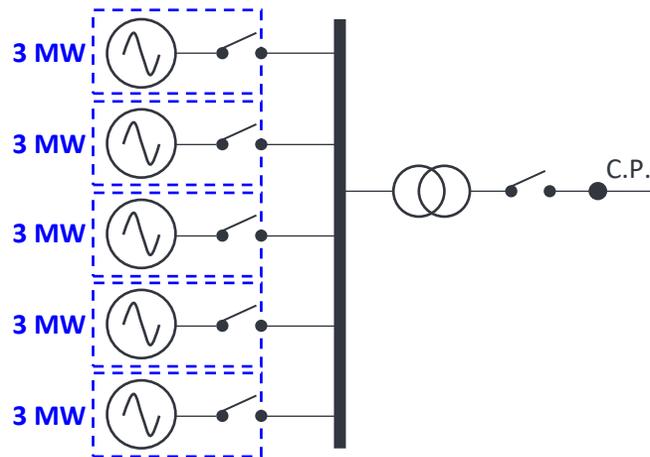


Type A	$800 \text{ kW} < P \leq 1 \text{ MW}$
Type B	$1 \text{ MW} < P \leq 5 \text{ MW}$
Type C	$5 \text{ MW} < P \leq 10 \text{ MW}$
Type D	$10 \text{ MW} < P$

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Country A:

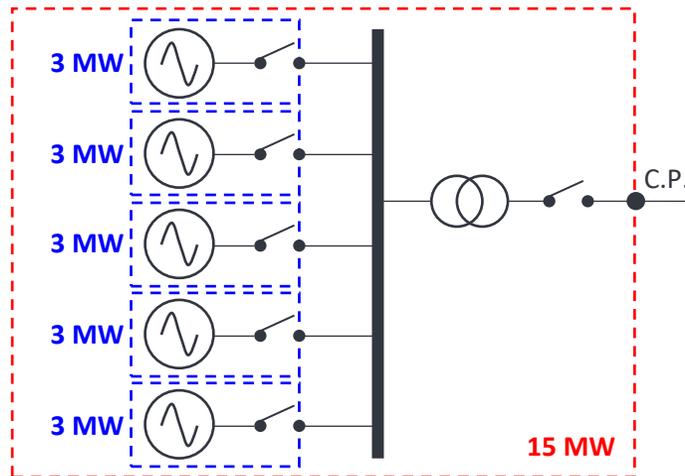
SPGM type classification based on **individual unit rating**

Each SPGM is considered **Type B**

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Country A:

SPGM type classification based on individual unit rating

Each SPGM is considered **Type B**

Country B:

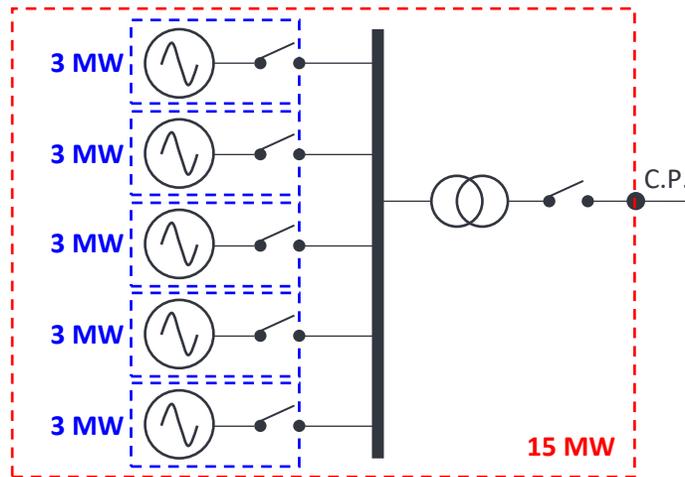
SPGM type classification based on aggregated capacity of the facility

Each SPGM is considered **Type D**

Determination of Significance of PGMs

a) Inconsistency of SPGM definition

Example: Power generating facility with 5x 3MW SPGMs



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Type D	$10 \text{ MW} < P$

Country A:

SPGM type classification based on individual unit rating

Each SPGM is considered **Type B**

Country B:

SPGM type classification based on aggregated capacity of the facility

Each SPGM is considered **Type D**

Proposal: Amendment to Preamble (9), Article 2(9), and Article 5(1) to clarify how the SPGM definition should be applied. The principle from Preamble (9), which states that individually run synchronous units must be classed on the machine size (and not the whole capacity of the facility) should be upheld.

- (9) The significance of power-generating modules should be based on their size and their effect on the overall system. Synchronous machines should be classed on the machine size and include all the components of a generating facility that normally run indivisibly, such as separate alternators driven by the separate gas and steam turbines of a single combined-cycle gas turbine installation. For a facility including several such combined-cycle gas turbine installations, each should be assessed on its size, and not on the whole capacity of the facility. Non-synchronously connected power-generating units, where they are collected together to form an economic unit and where they have a single connection point should be assessed on their aggregated capacity.

Determination of Significance of PGMs



b) Application of voltage criteria

Issue: As stated in the policy paper, the cumulative character of the capacity and voltage criteria in their present form can lead to some disproportionate technical requirements for PGMs compared to their actual impact on the system.

Many mixed customer sites connected to the distribution system include smaller PGMs which generate energy for the sites' own needs. The voltage criteria used to determine the type of a PGM means that small PGMs embedded in MCS are considered Type D if the connection point voltage is ≥ 110 kV.

Proposal: Amendment to Article 5(2)

EUROPGEN preference is to **remove the voltage criteria completely for determining significance**, so making the assessment of type based on (unit/module) MW size and its relative impact on the grid.

Technical requirements would then depend on the MW capacity (as proposed in the policy paper)

Demonstration of Compliance



Issues: Lack of harmonized PGU certificate acceptance across member states.

- Different certification approaches in different member states drive Manufacturers to repeatedly test the same genset and results in high costs to obtain multiple certifications. This can delay introduction of new products into the market.

No harmonized definition of a product family exists that permits translation of test results to other power generating units in the same product family in all member states.

- This is driving high costs on manufacturers for testing and certification of products.

No clarity on how to apply an equipment certificate for a power generating unit to demonstrate compliance at the point of common coupling in the case of multiple PGUs or mixed sites.

Proposal: EUROPGEN **strongly supports** the ongoing work of the Expert Group on Harmonised Certification Approach and Product Family Definition (EG HCF). The recommendations of the expert group should be considered for amendments to Article 2, and Articles 42-49 in the following areas:

- Provide a path towards a harmonized approach for demonstration of compliance (SG3 and SG4)
- Family definition for SPGMs and PPMs (SG5)
- Define an approach for acceptance of existing PGU certificates (SG3 and SG4)
- Recommend a harmonized approach to accept validated simulation models to be used for product family compliance demonstration (SG2)

Harmonisation of types B, C and D PGM requirements



Issues: In general, EUROPGEN would like to see a harmonized norm across all member states.

More specifically, NC RfG defines a framework for Type B, C and D FRT requirements, however national grid codes have added various conditions such as over-/under-excited pre-fault operating points which has led to inconsistency in national implementations.

- Article 14, Paragraph 3(a)(iv) states; *“each TSO shall specify and make publicly available the pre-fault and post-fault conditions for the fault-ride-through capability....”*
- Article 14, Paragraph 3(b) states; *“fault-ride-through capabilities in case of asymmetrical faults shall be specified by each TSO”*

In both references above **no boundary conditions are defined**, leading to further inconsistency.

Inconsistency drives complexity for manufacturers in demonstrating compliance and prevents use of certificates across multiple countries.

Proposal: Amendments to Article 14, paragraphs 3(a) and 3(b)

Harmonized, reasonable LVRT and OVRT boundary conditions are essential for pre-fault / post-fault conditions and asymmetrical faults

Simulation models and compliance monitoring



Issues: Inconsistency of simulation model functional and accuracy requirements is an issue for manufacturers

Simulation software is an issue - manufacturers are expected to maintain validated simulation models in multiple different software packages and version levels

No clear guidance on use of simulation models to demonstrate compliance

Protection of manufacturer intellectual property is a challenge

- Encrypted models are not always accepted, and system operators may be reluctant to sign NDAs

Proposals: Amendments to Article 43

- Harmonized simulation modeling requirements would be a positive step forward but should be aligned with the minimum requirements defined in ISO/IEC/EN standards and industry best practice
- If a simulation model is required, then the relevant system operator should:
 - a) accept a neutral model description in the form of a generic model block diagram and mathematical representation published in a document format, or;
 - b) provide options for multiple simulation software

Issue: Due to the upcoming Cyber Resilience Act, clarification is needed on the minimum cyber security requirements applicable to PGMs. This is an area of concern for manufacturers – there is a high risk of inconsistent requirements defined in national implementations and potential for lack of harmonization.

Proposal: New article to add clarity on minimum PGM requirements.

Improvements to the applicable rules and procedures



Issue: With a large volume of documents in many languages there is a risk of incorrect translation, which leads to misinterpretation of requirements. There is also a cost burden on manufacturers in sourcing translations. This was raised previously by EUTurbines and is supported by EUROPGEN.

Reference: EUTurbines proposal “Connection Network Code Amendments – The Necessity of Procedural Improvements”, Section 3.11, presented at the GC ESC meeting 7th December 2021

Proposal: EUROPGEN supports the EUTurbines proposal for “use of English as a second language for relevant documents” – proposal for new article 3(3) or 7(10)

3.11.2 Proposal for new article 3.3 or art 7.10

“The documents defining the requirements and the verification of the compliance as defined by each Member State and system operators shall also be available in English. Unless English is the official language of the Member State, the version translated into English shall bear the words “Translation of the original document”.”

- Aim is to place responsibility on the relevant system operator to publish a translation of the original document in English to avoid risk of misinterpretation of requirements due to incorrect translation.
- A reasonable time constraint for the translation to be available should be defined

Questions?