Classification of PGMs

ENTSO-E

GC ESC, 08 March 2018, Brussels

Network Codes /Guidelines requirements

- **NC RfG, Article 5**

  1. The power-generating modules shall comply with the requirements on the basis of the voltage level of their connection point and their maximum capacity according to the categories set out in paragraph 2.

  2. Power-generating modules within the following categories shall be considered as significant:

  (a) connection point below 110 kV and maximum capacity of 0,8 kW or more (type A);

  (b) connection point below 110 kV and maximum capacity at or above a threshold proposed by each relevant TSO in accordance with the procedure laid out in paragraph 3 (type B). This threshold shall not be above the limits for type B power-generating modules contained in Table 1;

  (c) connection point below 110 kV and maximum capacity at or above a threshold specified by each relevant TSO in accordance with paragraph 3 (type C). This threshold shall not be above the limits for type C power-generating modules contained in Table 1; or

  (d) connection point at 110 kV or above (type D). A power-generating module is also of type D if its connection point is below 110 kV and its maximum capacity is at or above a threshold specified in accordance with paragraph 3. This threshold shall not be above the limit for type D power-generating modules contained in Table 1. 27.4.2016 L 112/10 Official Journal of the European Union EN

- **GL SO, Article 2(1)(a)**
  - Requirements applicable to Significant Grid Users of type B, C, D

=> Impact on power-generating modules embedded in the networks of industrial sites, connected at 110 kV or above

Objectives of NC RfG

RfG, Article 1

This Regulation establishes a network code which lays down the requirements for grid connection of power-generating facilities, namely synchronous power-generating modules, power park modules and offshore power park modules, to the interconnected system. It, therefore, helps to ensure fair conditions of competition in the internal electricity market, to ensure system security and the integration of renewable electricity sources, and to facilitate Union-wide trade in electricity.

This regulation also lays down the obligations for ensuring that system operators make appropriate use of the power- generating facilities' capabilities in a transparent and non-discriminatory manner to provide a level playing field throughout the Union.

=> The intent was not to make a difference between plants connected within industrial sites and plants connected directly to the network (DSO, CDSO or TSO).

How to deal with the case of PGMs in industrial sites ?

German Solution for Mixed Plant

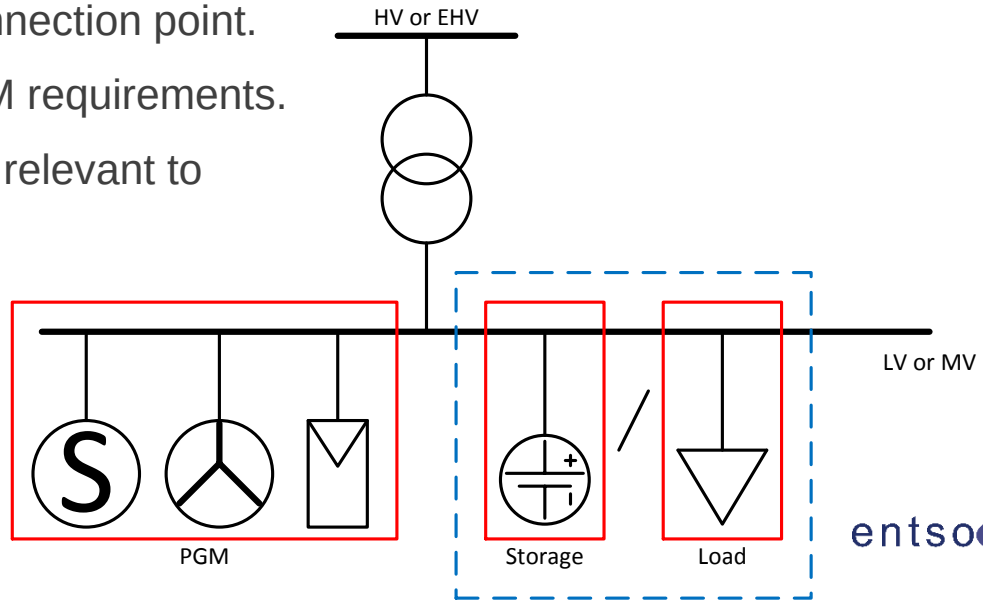
Definitions:

Mixed plant is a plant which is a combination of Generation and/or Load and/or Storage units which share the same connection point (existence of load and/or storage is necessary in the mix). $\mathbf{P_{AV,E}}$ is the maximum active power infeed at the connection point (based on agreement). $\mathbf{P_{SL}}$ is the sum of load and/or storage active power demand. Auxiliary is not considered as demand.

- if P_{SL} is less than 10% of $P_{AV,E}$, all units together should comply with all the requirements at the connection point
- if P_{SL} is greater than 10% and less than 50% of $P_{AV,E}$, the whole plant should comply to the reduced requirements (FRT, voltage and reactive power related requirements) at the connection point.

Remark: The requirements at the connection point are based on PPM requirements.

Remark: in all cases, all the units shall comply with the requirements relevant to their size, local voltage and type.

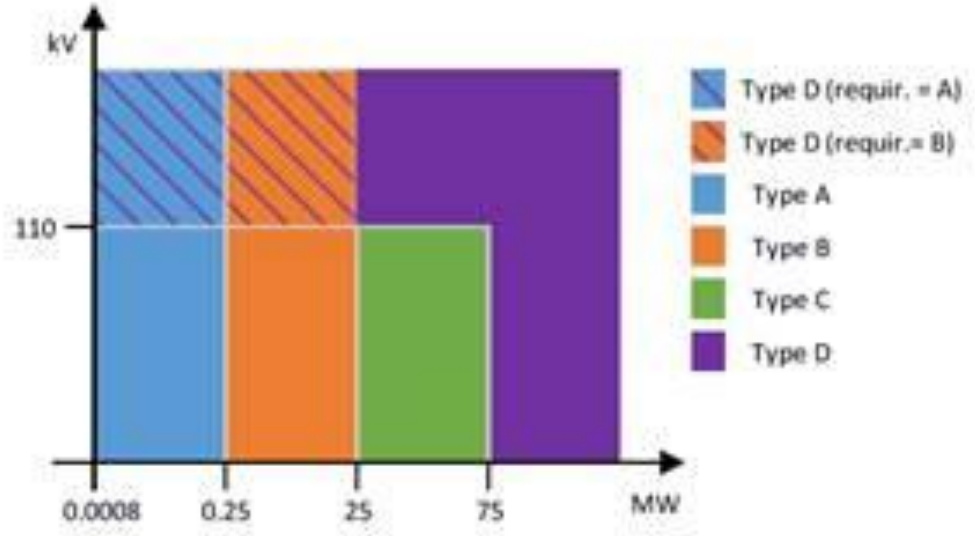


How to deal with the case of PGMs in industrial sites ?

Belgian Solution

In Belgium, the proposed approach is a class derogation of the requirements of PGM of type D which have U> 110 kV and Maximum Capacity P< 25 MW. These PGMs have to follow the requirement of type A or type B depending on their Maximum Capacity.

This can be summarized by the following figure:



The main arguments are:

- Fair level playing field: no different requirements for same power units, depending on the voltage connection level
- Design and check for conformity: for type A – standard for the suppliers, no extra cost. Additional requirements for type D impose design and verification case by case, at high cost.
- Power volume concerned by the derogation is very limited as the benefits for the system
  - Limited installed power of this segment
  - Limited expected growth of this segment
- Extra volume is not requested for proper system operation
- No significant impact on voltage and frequency

A CBA is being conducted:

- No higher performance needed for the system performance;
- PGMs have costs to be conformed with type D requirements;
- Therefore CBA is negative.

How to deal with the case of PGMs in industrial sites ?

French Solution

In France, the proposed approach is a class derogation for PGMs connected within a demand facility, connected above 110 kV.

In that case, the facility is connected to a voltage level U ≥ 110 kV because of the demand unit. The PGM (if alone) should have been connected to a lower voltage level.

For PGMs connected within a demand facility, the objective is to define the requirements (at the HV or EHV connection point) based on the Maximum Capacity of the PGM:

- Applying type A requirements for a type D PGM which has 0.8 kW ≤ P_{MAX} < $P_{A/B}$.
- Applying type B requirements for a type D PGM which has $P_{A/B}$ ≤ P_{MAX} < $P_{B/C}$.

Thank you for your attention!