



# Clarification of Definitions

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24/01/2017



# Clarification of Generating units and storage systems



- **Extract from the NC RfG**

“This Regulation shall not apply to:

- a) [...]
- b) power generating modules that were installed to provide back-up power and operate in parallel with the system for less than five minutes per calendar month while the system is in normal system state. [...]
- c) power generating modules that do not have a permanent connection point and are used by the system operators to temporarily provide power when normal system capacity is partly or completely unavailable;
- d) storage devices except for pump-storage power generating modules in accordance with Article 6(2).



- **Therefore, the following are not covered by the NC:**

Backup-up generators

However, for local issues they have to follow some basic rules (protection, ...power quality, ...)

Backup supplies of DSO and TSO during maintenance work  
Trains during breaking phases,  
Electric Vehicle while connected,  
....

Batteries, Electric Vehicle while connected, ...

# Power Generating Module and difference with existing “unité de production/productie eenheid” – status



## From Federal Technical Reglement:

41° « unité de production » : une unité physique comprenant un générateur qui produit de l'électricité;

42° « ensemble de production » : ensemble des unités de production ayant un ou plusieurs processus techniques de fonctionnement commun dont l'indisponibilité conduit à l'indisponibilité partielle ou totale des unités de production concernées;

43° « unité de production locale » : unité de production dont le point d'injection est identique au point de prélèvement d'une ou plusieurs charges;

41° « productie-eenheid » : een fysieke eenheid die een generator omvat die elektriciteit produceert;

42° « productiegeheel » : het geheel van productie-eenheden die één of meerdere technische processen gemeenschappelijk hebben en waarvan de onbeschikbaarheid leidt tot de onbeschikbaarheid van de gedeeltelijke of gehele betrokken productie-eenheden;

43° « lokale productie-eenheid » : productie-eenheid met injectiepunt identiek aan het afnamepunt van een of meerdere belastingen;

## From EU NC RfG

- 'synchronous power generating module' means **an indivisible set of installations** which can generate electrical energy such that the frequency of the generated voltage, the generator speed and the frequency of network voltage are in a constant ratio and thus in synchronism;
- 'power park module' or 'PPM' means a unit or ensemble of units generating electricity, which is either non-synchronously connected to the network or connected through power electronics, and that also **has a single connection point to** a transmission system, distribution system including closed distribution system or HVDC system;

# Power Generating Units and difference with existing “unité de production/productie eenheid” – status



## From Federal Technical Reglement

28° « point de raccordement » : la localisation physique et le niveau de tension du point où le raccordement est connecté au réseau et qui sépare la partie des installations de raccordement du réseau de transport de la partie des installations de raccordement dont la déconnexion du réseau de transport n'a d'effets que sur l'utilisateur du réseau raccordé à ce point:

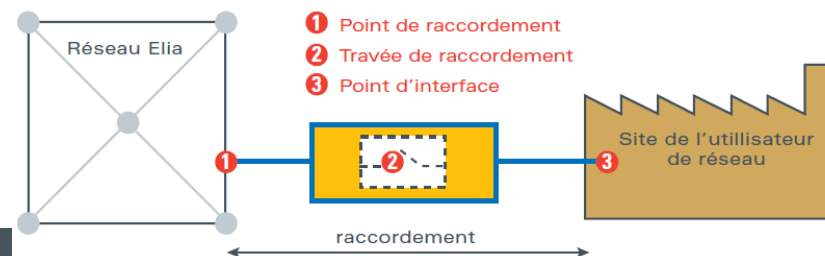
29° « point d'interface » : la localisation physique et le niveau de tension du point où l'installation d'un utilisateur du réseau est connectée aux installations de raccordement, ce point se situant nécessairement entre l'extrémité de la travée de raccordement au départ du réseau d'une part et, dans le cas d'utilisateurs raccordés au réseau via un jeu de barres, l'extrémité de la travée de raccordement reliée à l'installation de l'utilisateur du réseau, côté utilisateur, d'autre part;

28° « aansluitingspunt » : de fysieke plaats en het spanningsniveau van het punt waar de aansluiting is verbonden met het net en die het deel van de aansluitingsinstallaties van het transmissienet scheidt van het deel van de aansluitingsinstallaties waarvan de uitschakeling van het transmissienet slechts gevolgen heeft voor de netgebruiker aangesloten op dat punt :

29° « punt van interface » : de fysieke plaats en het spanningsniveau van het punt waar de installatie van een netgebruiker verbonden is met de aansluitingsinstallaties en die zich noodzakelijk bevinden tussen het uiteinde van het aansluitingsveld vanaf het net enerzijds en, in geval van netgebruikers aangesloten tot het net via een railstel, het uiteinde van het aansluitingsveld verbonden tot de uitrusting van de netgebruiker, aan de zijde van de netgebruiker anderzijds;

## From EU NC RfG

- ‘connection point’ means **the interface** at which the power generating module, demand facility, distribution system or HVDC system is connected **to a transmission system, offshore network, distribution system, including closed distribution systems, or HVDC system, as identified in the connection agreement;**



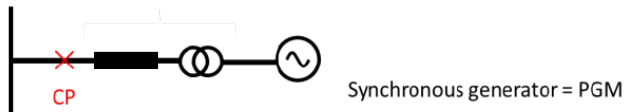
## Additional extracts from the NC RfG



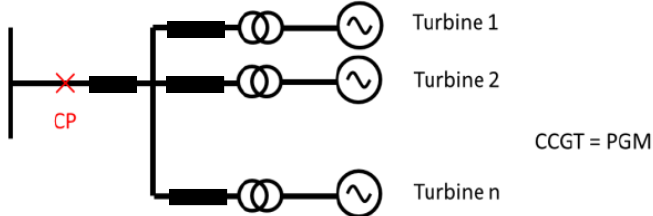
- Definition (19) - 'offshore power park module'
  - 'offshore power park module' means a power park module located offshore **with an offshore connection point**;
- Preamble (9)
  - The significance of power generating modules should be based on their size and their effect on the overall system. Synchronous 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.
  - **Power park modules**, 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.

# What is a Power Generating Module? Concept 1: Concept of “indivisible set of installations” for SPGM

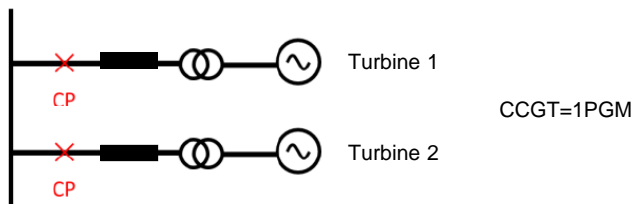
Impedance between the alternator and the CP (e.g. TFO and or cable could be absent)



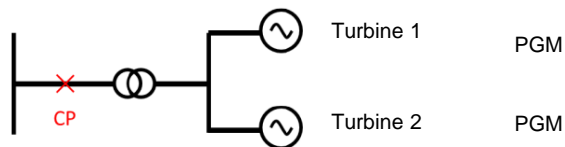
A single-shaft CCGT (only one generator with several turbines on the same shaft), an hydro unit, a diesel, ... is a single synchronous generating unit => 1PGM



Ensemble of synchronous units that cannot be operated independently from each other (e. g. multi-shaft CCGT where the steam turbine (ST) cannot be operated standalone, but together with at least one gas turbine (GT)). => 1PGM

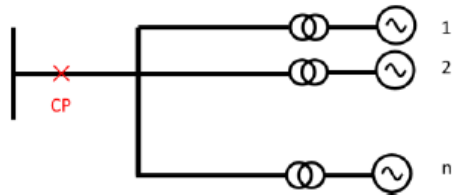


The case of a CCGT where the ST has a dedicated connection point. Obviously the ST itself will not be able to meet all relevant RfG requirements. In this case the concept of connection point should be understood in a flexible manner (the 2 physical points are the connection point)

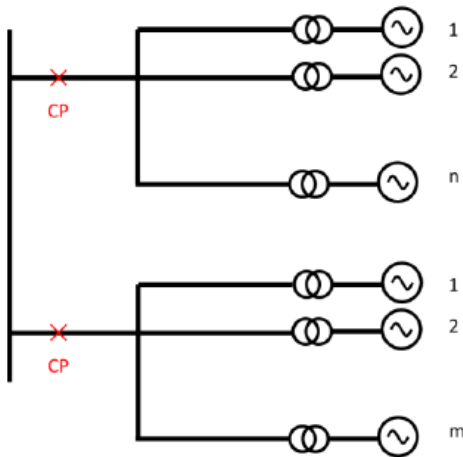


Ensemble of synchronous units that are controlled separately even if have a shared transformer => 2 PGMs  
=> Common equipment do not prohibit from operating one unit without the other.

# What is a Power Generating Module? Concept 2: Concept of “ensemble of units” and “single connection point” for PPM

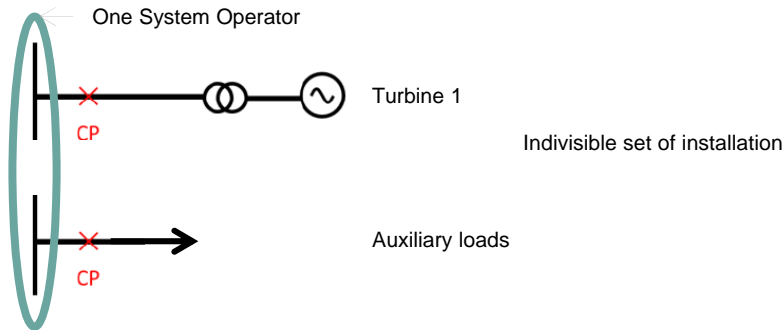


Single PPM in a wind farm operated as one combined unit

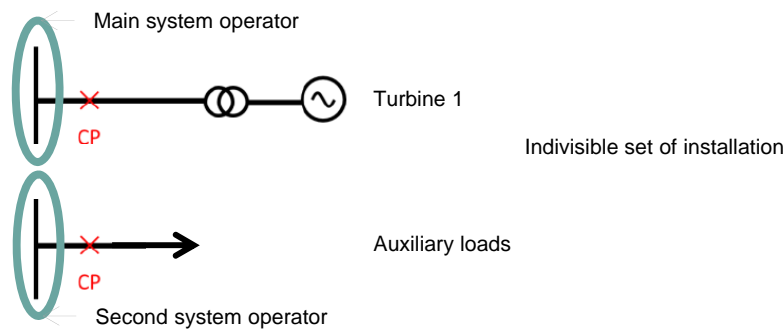


Two PPMs as they are operated separately or in a combined manner but have 2 connection points  
⇒ 2 PPMs

# What is a Power Generating Module? Concept 3: Connection Point “as identified in the connection agreement”



The case of a power generating module with the auxiliary power (needed for the operation of the module) connected at another location in the grid operated by one SO. In this case the concept of connection point should be understood in a flexible manner (the 2 physical points are the connection point)



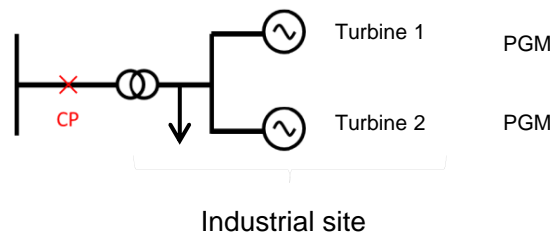
The case of a power generating module with the auxiliary power (needed for the operation of the module) connected at another location in the grid which is operated by another SO than the grid at the generating site.

The concept of connection point should be understood in a flexible manner (the 2 physical points are the connection point) and the connection process (EON, ION, FON) should be dealt in coordination between the system operation. Coordinating role should be in hand of the system operator where the generating part is connected.

Note that, if relevant, this concept can be generalized easily for PPM

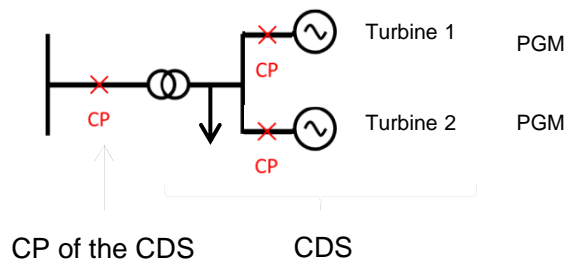


# What is a Power Generating Module? Concept 4: Load and Local Generation in CDS or Not



2 single (local) synchronous generating unit => 2 PGMs connected at the Transmission network or Distribution Network Connection point of the industrial site.

Each PGMs can meet the grid code requirement event in the absence of the other PGM and in any operating point of the industrial site. Process relation (e.g. cogeneration for the generation of electricity and used in the industrial site) are to be taken into account in defining the operating points.

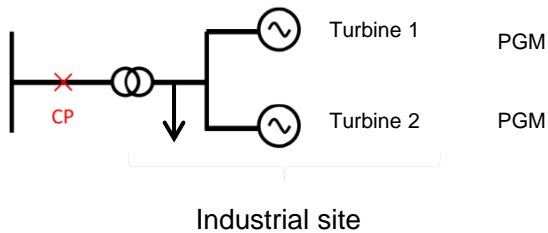


2 single (local) synchronous generating unit => 2 PGMs connected at the Connection Point within the (Closed) Distribution System.

The (Closed) Distribution System is the system operator and is responsible to verify the compliance of the PGMs

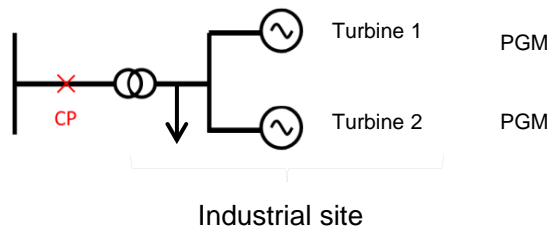
Note that, if relevant, this concept can be generalized easily for PPM

# What is a Power Generating Module? Concept 5: Shared Connections or Not



2 single (local) synchronous generating unit  
 ⇒ 2 PGMs

⇒ One connection contract with the SO  
 Any ancillary service contracts are defined at the connection point and are to be agreed with the owner of the holder of the connection contract.

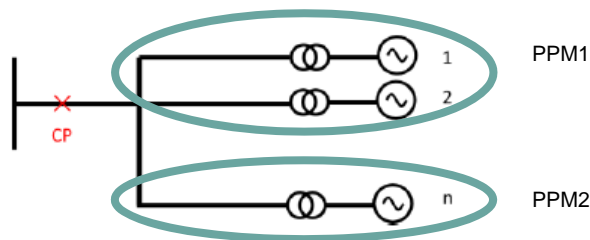


2 single (local) synchronous generating unit having a shared-connection

⇒ 2 PGMs

⇒ One connection contract with the SO but several parties known in the contract

Management of ancillary service contracts are defined in the shared-connection contract



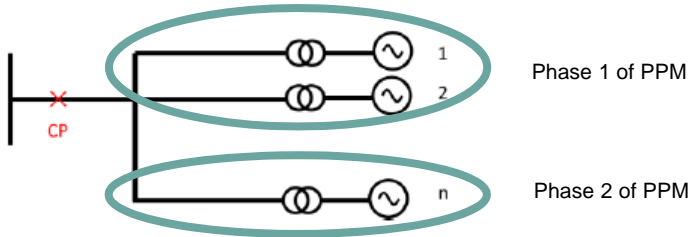
Two PPMs in a wind farm operated separately, having a shared-connection and that can meet the grid code requirement even in the absence of the other wind farm.

Note that, if relevant, this concept can be generalized easily for PPM or SPGM

# What is a Power Generating Module? Concept 6: Detail Study and Project Phasing

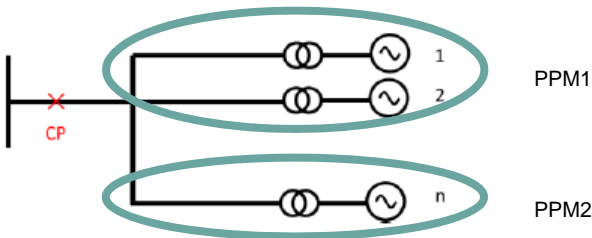


- A Detail Study with 2 phases



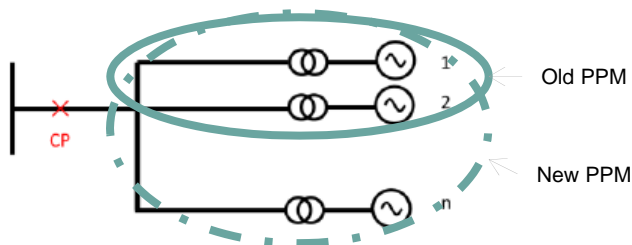
Single PPM in a wind farm operated as one combined unit after the 2 phases are finalized

- A Detail Study with 1 phase + A new Detail Study requested later on



Two PPMs in a wind farm operated separately

- A Detail Study with 1 phase + A new Detail Study requested later on to increase the power of the PPM capacity



Single PPM in a wind farm operated as one combined unit



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