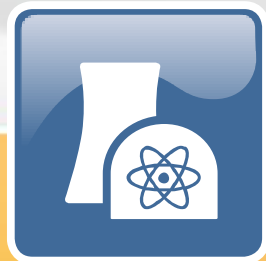


Guideline on System Operation : **List of items to improve.**

SUBMITTED AT SO ESC ON 7 MARCH 2018



Content

It was proposed at the Brainstorming Session on 31/1/2018 to list all items susceptible for improvement of the RfG network code and to create one or more workshops to solve those issues.

This presentation gives a similar list for the Guideline on System Operations. All stakeholders are invited to add items and to participate at the workshops.

This presentation can be divided in three parts :

- Generic items
- Important items
- Minor items

What are the next steps?

Status HVDC installation

Art. 2.1.f defines a HVDC installation as a significant grid user (SGU).

But compared to a generator or a consumer, a HVDC installation is not subjected to several requirements; See some examples below :

Art. 3.87 (definitions) : the notion “outage planning agent” does not exist for a HVDC system.

Art.15 (annual report on operational security indicators) is applicable for generators and grid elements but NOT for HVDC systems.

Art.22.1.c (remedial actions for voltage control) : HVDC is not mentioned in the list of actors.

Art.22.1.g (remedial actions) : imposes only an adjustment of ACTIVE power through a HVDC system, not for reactive power.

Art. 84 (assessment of outage coordination) is only applicable for generators, consumers and grid elements, not for HVDC.

Art. 85.2 en Art. 85.4 : (list of relevant PGMs and demand facilities) : idem

Art. 86 (update of lists of relevant PGMs and demand facilities) : idem

Art. 89 (appointment of planning agents) : not applicable for HVDC because it is not listed as relevant assets according to Def. 84.

Art. 94 (year-ahead availability plan) : this applies not for HVDC because a HVDC is not a relevant asset.

Art. 103 (real time execution of availability plans) describes specifications for PGMs, demand facilities and grid elements. Nothing for HVDC.

Art. 109 (reactive power ancillary services) : nothing specified for HVDC.

Art. 113 (information exchanges between TSOs) describes procedures for AC links but not for HVDC.

What is the intention of this Guideline?

Operational rules for storage / batteries

According to Art 3.2.d of the RfG code, storage devices (except pump storage) are not subjected to the RfG code.

=> Not within the scope of GL SO according to Art. 2.1.a

=> Batteries (and other storage devices) are excluded from this GL SO.

What is the intention of ENTSOE?

Are such exclusions appropriate?

Note : Storage devices are subjected to E&R code (Art. 2.5)

Small PGM installed at an industrial site > 110 kV

According to the RfG code, small PGMs (e.g. a photovoltaic panel of 100 W) installed in a consumer's installation, connected at 110 kV or more, are class D PGMs and are subjected to this GL SO.

This does not sound logic for small PGMs.

Has ENTSOE a strategy to solve this problem?

Note :

- Art. 46 (Scheduled data exchange) : Each SGU which is a power generating facility owner of a type B, C or D power generating module connected to the transmission system shall provide the TSO with at least the following data => acceptable
- Art. 47 (Real time data exchange) : Unless otherwise provided by the TSO, each significant grid user which is a power generating facility owner of type B, C or D power generating module shall provide the TSO, in real-time, at least the following data: => added value = ???
- Art. 48 – 51 : idem for PGMs connected at a DSO network at 110 kV or above.

Important Items (1)

- Art.18.4.b : Why is the status of black-out applied after **three minutes** of absence of voltage in the control area?
- Art. 21.1.a and 22.1.i allow TSOs to open an interconnector in case of emergency. Shall generators and consumers be **compensated**?
- Art. 22.1.c.iv allows TSO to block automatic voltage control.
Who will compensate the **damage** when IEC standards are not respected?
- Art. 22.1.j allows to activate a manually controlled load shedding.
Is this done according to an **existing agreement** with the consumer?
- Art. 23.4 imposes remedial actions when the system is NOT in normal or alert state. This is a subject for the E&R code instead the GL SO?
- Art. 24.1.e imposes the TSOs to facilitate cross-border operations. How to interpret this obligation in case of emergency (Art. 21.1.a and 22.1.i)?
- Art. 25.2 requires to take into account the **frequency limits** of SGU in normal and alert situations. But nothing is said about submission of those limits (see Art. 28.3). What about the rights of DSOs (\neq SGU)?

Important Items (2)

- Art. 28.1 imposes to submit the applicable voltage ranges of existing SGU before 14/12/2017. This is supposed at 50 Hz only. Correct?
- Art. 31.3 imposes max. and min. limits for short-circuit currents. A deviation of the limits is only allowed during switching operations. The min. value has to be respected at all times. Correct?
- Art. 33 : To add at the contingency analysis : **successive voltage dips** due to lightning can provoke the tripping of PGMs (Cfr. black-out in Australia)
- Art. 37 describes a “**special** protection scheme”. What is such scheme?
- Art. 45.1.k imposes to determine the cost of remedial actions. How? How do we have to interpret “**market based** mechanisms”?
- Art. 54.4 allows tests at any time referring to Art.41.2 of RfG allowing only tests according to a “repeat plan”. We suppose that **RfG prevails** for ALL PGMs.

Important Items (3)

- Art. 95 (outage planning) : the allocation of costs detected at incompatibilities is unclear. Who shall **bear those costs**?
- Art. 98.4.a allows a TSO to force an “unavailable status” into a “available status”. This is not always possible. E.g : refuelling of a nuclear PGM.
- Art.102.1 imposes a **procedure for forced outages**. Why? This is an element of the contingency analysis made by the TSO. What is the intention of this article?
- Art. 102.3 : “When undertaking the procedure, the TSO shall respect, **to the extent possible**, the technical limits of the relevant assets.” Meaning???
- Art. 119.1.c : **Ramping restrictions for PGMs** : more information and values are needed to analyse the impact of this article.
- Art.152.8-13 & 16 allows a TSO to modify the active power of generators and consumers to grant sufficient reserves (FRR, RR, FRCE). Is this done according market rules or agreements with SGU?
- Art.156.9 imposes that FCR is continuously available. This does not apply when a PGM does already supply FCR in normal state or alert state. Correct?

Important Items (4)

- Art. 156.13.b requires the recovery of the energy reservoir for FCR within 2 hours after the **end of the alert state**. Questions : \neq emergency state? / = with active markets? / what without markets? / single event or several events? Details are missing.
- Art. 157.2.a describes the dimensioning of FCR based on historical data. This should be based on a “**lessons learned**” approach. Cfr. Incident 4/11/2006.
- Art. 157.2.j & k imposes sufficient FRR during 99% of the time. Meaning that during 86 hours per year, a black out is realistic. Why not **99,9%** instead of 99%?

Minor Items (1)

- Art. 2 : A DSO is not a SGU according to recital 3. Correct???
- Art. 3 : “load-frequency-control” is not defined (see Def. 12; 18; 140)
- Art. 3.71 : ‘**availability status**’ means the capability of a power generating module, grid element or demand facility to provide a service for a given time period, regardless of whether or not **it is in operation**
More explanation needed for the terms “available” and “in operation”.
- Art. 7 : ACER cannot propose amendments. Why??
- Art. 8.1 : Is a TSO legally obliged to inform stakeholders by other means than the internet? What is the legal status of an “**hidden**” internet publication?
- Art. 27.5 (voltage ranges for DSO < 110 kV) : what with DSO at 110 kV or more?
- Art. 35 allows a TSO to consider the N-1 criterion as sufficient.
This is not allowed for **SEVESO plants** and nuclear PGMs.
- Contradiction between Art.40.3 (generation/ consumption) and Art. 40.4 (injections / withdrawals)??

Minor Items (2)

- Art. 52.3 : The min. and max. power to be curtailed is NOT a real-time data.
- Art.109.3 : At un-sufficient **reactive** power, the regulator is not informed. Why?
To compare to Art. 105.3 for active power : the regulator is informed.
- Art. 110.4 : No definition of a shipping agent. Unknown role.
- Art.114 : the information in the ENTSOE operational planning data environment is of paramount commercial value for traders. **How will ENTSOE prevent leakages?**
- Art.119 : LFC block, LFC area, outage coordination area and monitoring area are new terms. Could those be explained and visualised in a list or a map?
- Art.127.8.b requires a public consultation for a modification of the frequency quality parameters. **What is the role of the ESC?**
- Art.128.1 : the terms Level 1 FRCE range and Level 2 FRCE range are not clear.

Minor Items (3)

- Art. 133 : A TSO has to collect data to define the frequency quality parameters. Who will have access to those parameters.? Will they be published? (Idem 134.4)
- Art. 135 allows a TSO to request data from generators and consumers **related to imbalances**. What is the purpose of this? Imbalance is a notion at portfolio level.
- Art. 137.4 (ramping rates for generators and demand) : What is the added value if the modifications are within a LFC block / a single synchronous area? This provision can provoke **additional unbalances** if too restricting.
- Art. 138 describes measures in case the frequency quality is not respected. The proposed mitigation is with the **existing quality parameters**. Correct?
- Art. 154.3 specifies that a TSO can impose additional requirements for FCR. Are other criteria than geographical ones possible?
- Art.185.1 & 5 impose to notify ENTSOE about **modified frequency quality parameters**. Is this according Art. 6 (approval process) and Art. 11 (public consultation).

QUESTIONS?