EXPLANATORY NOTE RELATED TO THE PUBLIC CONSULTATION OF THE TERMS AND CONDITIONS FOR VOLTAGE SERVICE PROVIDERS

27/01/2020

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1. Practical information

This note aims to contextualize the document to be submitted by ELIA as required by Article 234 of the Federal Grid Code.

At the end of the public consultation, all non-confidential comments will be made public on Elia's website, with an explanation of how Elia responded to these remarks or the reasons why they were not considered. Elia will respect the request for confidentiality and/or anonymity of respondents.

Comments concerning items outside the scope of the documents will not be considered by Elia.

The document submitted for consultation can be consulted on the Elia website.

The public consultation lasts 4 weeks. Reactions must be sent no later than Monday 24/02/2020 using the online form available on the Elia website.

Questions relative to the consultation can be sent to the following email address: consultations@elia.be.

2. Introduction

The document subject to consultation constitutes a proposal by ELIA regarding the terms and conditions applicable to Voltage Service Providers or 'VSPs' (hereinafter referred to as the 'T&C VSP') and includes the requirements set up in Article 234 of the Federal Grid Code:

(1) The terms and conditions applicable to VSPs,

(2) The technical specifications for the provision of the service for reactive power and voltage management,

(3) The participation conditions,

(4) The mechanism for the constitution of the service,

(5) The modalities for the compensation with regard to the participation to this service.

These T&C VSP translate the design evolution of the service for reactive power and voltage control that was first described in a design note published in 2018. The implementation of all evolutions described in the above mentioned design note requires an adaptation of the regulatory framework (namely the federal and regional grid codes as well as the Electricity law). These modifications mainly concern:

- The contracting process of the Service: the new design foresees the possibility for a standard participation to the service by each unit while currently the service is contracted after a tendering procedure;
- The participation to the Service: the new design foresees a mandatory participation for some assets while participation is voluntary today;
- The introduction of the role of VSP (Voltage Service Provider) designated by the Grid User
- The remuneration of the Service and the link with the tariff for the offtake or injection of additional reactive energy.

The new Federal Grid Code has been adopted in April 2019, the Regional Grid Codes and the Electricity Law have not yet been amended. Elia has developed the Terms and Conditions for Voltage Service Providers based on the future design evolutions foreseen in the design note of 2018 for those that are compliant with the current legal framework.

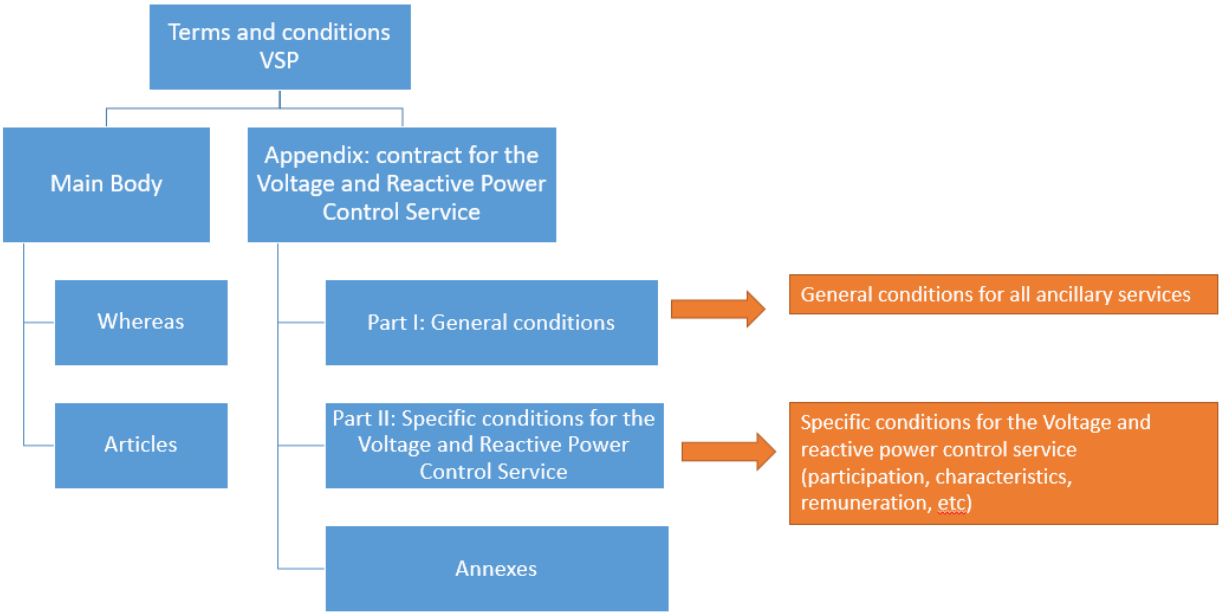
This explanatory note gives a brief description of the principles and main modifications brought by Elia to the service for reactive power and voltage control. .

3. Terms and conditions for Voltage Service Providers explanation

3.1. Structure of the T&C VSP

The structure of the T&C VSP is similar to the structure of the other T&C for ancillary services:

- General Terms and Conditions containing the articles that are applicable for all ancillary services
- Specific Terms and Conditions for the voltage and reactive power control service
- Annexes



As specified in the T&C VSP, the General Terms and Conditions (Part I) were consulted in October 2019 for all Terms and conditions for ancillary services.

Consequently, the General Terms and Conditions are not open to comments anymore, unless upon explicit motivation of the respondent(s) given the specific context of the contract concerned.

3.2. Participation to the voltage and reactive power control service

3.2.1. Compliancy with Art. 234 of the Federal Grid Code

In application of Art. 234 § 2 of the Federal Grid Code (FGC) of 22 April 2019, the provision of the voltage and reactive power control service becomes mandatory for some Grid Users that are or will be in charge of existing or new PGM of type B,C D as well as for new HVDC-connected generators and offshore wind power park modules.

Next to the FGC, the VREG, the CWAPE and BRUGEL approved on September 2019 the General Requirements applicable for all new PGM. Those requirements foresee that new PGM type B and C have to put at disposal of their Relevant SO their reactive capabilities.

An exhaustive list of the technical units obliged to participate is available on the figure below. This figure also indicates the articles of the Federal Grid Code and respectively the General Requirements describing the technical requirements regarding the capability to control the voltage and the reactive power for each type of Grid User.

In addition to obliged parties, some Grid Users can participate to the Service on a voluntary basis. In particular, this is the case for any Grid User connected to a distribution grid or to a closed-distribution grid. The figure below details also the voluntary parties.

	Grid user	Federal level		Regional level	
		Participation	FGC articles	**Participation**	General requirements rfG
Elia grid	New Type B,C,D SPGM	Obliged	Art. 89 +234	Obliged	Art. 4.3.1/5.5.1/-
	New Type B,C,D PPM	Obliged	Art. 93 & 99 +234	Obliged	Art. 4.4.2/5.6.2/-
	New Type B, C, D SPM	Obliged	Art. 93 & 99 +234	Voluntary	No RGC yet
	New HVDC interconnector	Obliged	Art. 104 +234	n.a.	
	New generators connected on a HVDC link	Obliged	Art. 106 + 234		
	New HVDC conversion stations at isolated extremity	Obliged	Art. 107 +234		
	New offshore generators with onshore connection points	Obliged	Art. 117 & 118 +234		
	New offshore generators with offshore connection points	Obliged	Art. 130 & 131 +234		
	Existing generator type C,D	Obliged	Art. 62 to 68 +234	Voluntary	No RGC yet
	Existing generator type B	Obliged	Art. 62 to 68 (To be agreed with system operator) +234	Voluntary	
	Direct clients demand facilities	Voluntary	Art. 234	Voluntary	
Non- Elia grid	DSO	Voluntary	Art. 234		
	CDSO	Voluntary	Art. 234		

With:

- PPM = Power Park Modules,
- SPGM = Synchronous Power Generating Modules
- SPM = Storage Power Modules

3.2.1.1. VSP role

In the current provision of the service, the contract is signed between Elia and the BRP that is appointed for the concerned asset providing the service. In section 6.6 of the design note, Elia proposed the introduction of the Voltage Service Provider role. This later is contractually, technically and operationally responsible for the delivery of the service to Elia.

In accordance with art. 234, 5th al., of the Federal Grid Code, the VSP is the grid user of each Technical Unit providing the service or a third party appointed by the grid user as VSP. A specific template is foreseen in Annex 11 of the VSP contract for the designation of the VSP by the grid user.

3.2.1.2. VSP of a grid user connected to a public distribution system or a CDS

The art. 234, 4th al., of the Federal Grid Code states that the service for reactive power and voltage control can only be delivered by a grid user connected to a public distribution grid or to a CDS if the DSO or CDSO gives a prior approval. Conform this article, the exact modalities for the participation of grid users connected to public distribution grid or to a CDS are described in the VSP contract.

In section 9.2 of the design note, Elia proposed that the VSP of a technical unit connected to a public distribution grid or to a CDS (that wants to participate voluntarily to the service) should be respectively the operator of the public distribution system (DSO) or the operator of the CDS (CDSO). Stakeholders supported this solution during consultation of the design note.

Article II.3.3 c) and d) of this VSP contract proposal are written in accordance with this proposition.

3.2.2. Procurement process according to Art. 12 quinquies of the Electricity Law

Art. 12 quinquies of the Electricity Law foresees that Elia organizes a tender for the procurement of the service for reactive power and voltage control. For a full implementation of the design proposed in 2018 an adaptation of the Electricity Law is necessary.

Currently, no amendments of the Electricity Law has been made. Hence, the service will be contracted through a tender procedure, conform the Electricity law. In accordance to Art. 234 § 2 of the Federal Grid Code, all parties that are obliged to provide the service shall have to participate to the tender.

3.1. Prequalification procedure

During the **prequalification procedure, a prequalification test** is performed before delivery of the service and aims at measuring and determining the main characteristics and parameters used for the service delivery and settlement e.g.:

- The reactive power technical control band which is defined by the technical minimum and the technical maximum reactive power that a technical unit can absorb or generate;
- The Service Measurement Point which is the point where the service is delivered by a technical unit. The remuneration and control of delivery of the service are based on the measurements of voltage and/or reactive power at this Service Measurement Point. The Service Measurement Point is by default:
    - the access point (for technical units connected to the Elia Grid or to a CDS connected to the Elia grid) or
    - the Interconnection Point (for technical units located in distribution grid);
- The sensitivity coefficient (alpha) in case the VSP provides the automatic voltage control service. This coefficient defines the linear relation between the voltage and the reactive power produced or absorbed at the Service Measurement Point. Elia will determine this sensitivity coefficient in collaboration with the VSP.

Remark: if, during the determination of the sensitivity coefficient, a clear relation between the voltage and the reactive power cannot be determined at the level of the access point (for instance when the technical unit is a local production unit located in the internal grid of the Grid User “far from” the access point), Elia may request, during the prequalification phase after discussion with the VSP:

- ⇨ to move the Service Measurement Point to a point located downstream the access point and at the level of the technical unit, and this upon agreement of the VSP[1];
- ⇨ to provide the manual service instead of the automatic service[2].

3.2. Remuneration of the service

Currently, the remuneration of the service is based on the **measured reactive power** at the access point of a unit. In order to remunerate the reactive power that is needed by the system and to allow a correct participation of all assets to the service, Elia introduces a new remuneration mechanism based on the **requested reactive power (Qreq-rem)** (as described in annex 2 of the VSP contract proposal). This requested reactive power volume consists of:

- For the manual service, the setpoint(s) sent by Elia in the context of a manual activation;
- For the automatic service, the automatically requested reactive power that represents the reactive power that the unit should deliver at the Service Measurement Point based on the voltage variations on this point. The value of this automatically requested reactive power, is computed by Elia and is a function of the voltage measured at the Service Measurement Point and the sensitivity coefficient (alpha). Qreq-auto = f(GV, alpha)

As a controlling unit provides both the automatic and manual control services, the requested reactive power is then composed of the sum of the two above components. More precisely, the requested reactive power for remuneration is computed based on the following equation:

$$Q_{req\_rem} = -\frac{\left(GV(t) - V_{startup}\right) * \alpha_{eq} * 0{,}45 * P_{tech\_max}}{U_{norm\_exp}} + \Delta Q_{req}$$

1 2

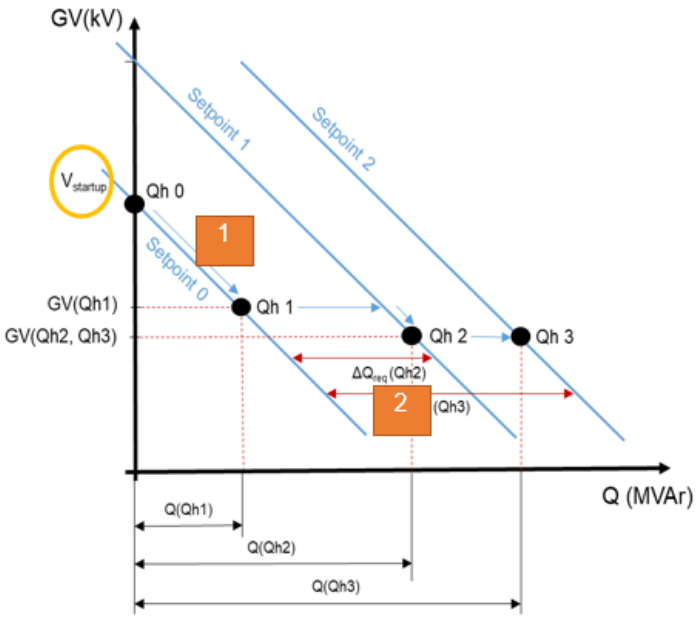
1. The automatically requested reactive power, which is a linear function of the grid voltage measured at the Service Measurement Point with a slope equals to the sensitivity coefficient. The droop curve is defined by this sensitivity coefficient and by the $V_{startup}$ as defined below.
2. The manually requested reactive power that equals to the setpoint changes requested by Elia

[1] For instance if the adequate measurement and/or metering devices exist at the level of the technical unit

[2] For the manual service it is not necessary to identify a clear relation (sensitivity coefficient) between the voltage and the MVAr produced/absorbed at the level of the access point

Where:

- GV(t): the grid voltage for the specific quarter-hour controlled;
- $V_{startup}$: the average grid voltage value of the quarter-hour during which the unit started up for the last time (meaning the last moment in time where the technical unit's active power injection value exceeded its P_{min} value as agreed in the annex 1 of the VSP contract
- ΔQ_{req}: The last Setpoint change value communicated by Elia.



The determination of a requested reactive power volume in the context of the service for reactive power and voltage control is also coherent with the modifications related to the tariff for the offtake or injection of additional reactive energy as described in the tariffs applicable for the period 2020-2023 .

3.3. Delivery control of the service

To be coherent with the new remuneration (based on the **requested** reactive power and not anymore the measured reactive power), Elia introduces some modifications of the delivery control mechanism in order to increase its accuracy and efficiency. The main elements that change in this VSP contract proposal are:

- The tolerance band defined to be proportional to the reactive power capability of the unit (in percentage of the technical maximum reactive power of the technical unit). The tolerance band is identical for both manual and automatic service.
- For automatic delivery control: the delivery control is based on the difference between the reactive power requested by the service (and used for the remuneration) and the reactive power measured at the Service Measurement Point considering the defined tolerance band **for each quarter-hour**. The deltas between both values will be analyzed in 6 samples per month (as it is the case for the current service) and the quarter-hours that are outside the tolerance band limits will be considered as failed quarter-hours. The penalty will be applied by comparing the total number of failed

quarter-hours with the total number of quarter-hours analyzed in the 6 monthly samples (as described in annex 6 of the VSP contract proposal).

- For manual service: no changes of the delivery control are made compared to the current mechanism.

3.4. Link between the service and the tariff for the offtake or injection of additional reactive energy

In the framework of the modifications related to the tariff for the offtake or injection of additional reactive energy (as described in the tariffs applicable for the period 2020-2023), some links between this tariff and the service for reactive power and voltage control need to be highlighted:

1. The modification of the tariff for the offtake or injection of additional reactive energy foresees that, in case an activation by Elia of (automatic or manual) voltage control causes an impact on the determination of quarter-hourly deliveries for a given access point or interconnection point, this tariff will be corrected on the basis of activations requested by Elia. Concretely, it means that the requested reactive power as defined in the VSP contract proposal will be used for this correction. The tolerance margin defined in the VSP contract proposal will also be applied when correcting the tariff for the offtake or injection of additional reactive energy.
2. To avoid a double penalization related to the tariff for the offtake or injection of additional reactive energy and the delivery control of the service, the delivery control of the service will take into account the possible penalty already applied in the context of the tariff for the offtake or injection of additional reactive energy i.e.
    - For both the automatic and manual services: in case of a failed delivery control, any quarter-hours for which a reactive power volume has already been penalized through the tariffs for the offtake or injection of additional reactive energy will not be considered in the delivery control.
3. The VSP contract proposal imposes that the VSP shall have a bilateral agreement with the Access Contract Holder acknowledging and accepting the modalities of service delivery and the interactions between the service and the application of the tariffs as per modalities described in Elia's tariff proposal. This bilateral agreement considers in particular the fact that the tariff for the offtake or injection of additional reactive energy is corrected with the reactive power requested by the service (provided by the VSP) as described above.

Note: the elements described in this last section are not directly related to the VSP contract but to the tariffs. They are described here so that the market players can make all the necessary links. Hence, only points 2 and 3 are mentioned in the VSP contract.