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Contract for Voltage & Reactive Power Control Service

“VSP Contract”



Contract Reference [ContractReference]

between

[Company], a company established under **[Country]** law with registered offices at **[Address]**, company registration number **[Number]** and validly represented by **[Name1]** and **[Name2]**, in their respective capacity of **[Role1]** and **[Role2]**;

hereinafter referred to as the "**[ServiceProvider]**",

and

ELIA Transmission Belgium N.V./S.A., a company established under Belgian law with registered offices at Keizerslaan 20, B-1000 Brussels, registered at the Crossroad Bank for Enterprises under number 0476.388.378 and represented by **[Name1]** and **[Name2]**, in their respective capacities of **[Role1]** and **[Role2]**;

hereinafter referred to as "Elia",

Elia and the **[ServiceProvider]** may also hereinafter be referred to individually as "the Party" and collectively as "the Parties".



Whereas:

- Elia is responsible for the operation of the Belgian transmission system over which it has an ownership right or, at least, a right of use (hereinafter referred to as the "Elia Grid");
- Elia has been appointed as Transmission System Operator (hereinafter referred to as the "TSO"), in accordance with the Belgian law of 29 April 1999 concerning the organisation of the electricity market (hereinafter referred to as the "Electricity Act") and supervises the safety, reliability and efficiency of the Elia Grid;
- Elia must therefore safeguard operational security, frequency quality and the efficient use of the interconnected system and resource – in accordance with the Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation (hereinafter referred to as "SOGL");
- [VSP] has expressed its willingness to become a Voltage Service Provider ("VSP") according to the terms and conditions of this Contract for the Voltage and Reactive Power Control Service;
- The Parties understand that this Contract is not a contract granting access to the Elia Grid;
- The Service is procured as part of the Grid User's obligation and/or voluntarily, according to article 234 of the Federal Grid Code and to article 12 *quinquies* of the Electricity Act;
- The General and Specific Conditions as detailed hereafter shall govern the Contract, as well as the rights and obligations of the Parties relating to the Voltage and Reactive Power Control Service , without prejudice to the applicable provisions of the Federal Grid Code or, where appropriate, without prejudice to compliance with the relative Sensitivity Coefficient set in Annex 1 in accordance with the criteria defined to that end in the Connection Contract for the Technical Unit concluded with Elia;
- This Contract falls under the Terms and Conditions for Voltage and Reactive Power Control Services.

the following points have been agreed:

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PART I - GENERAL CONDITIONS

[The General Conditions are part of a separate public consultation available on the Elia website]



Part II - Specific Conditions

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PART II - SPECIFIC CONDITIONS

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TITLE 1: DEFINITIONS

ART. II.1 DEFINITIONS

Except where there is further specification aimed at application for the purposes of the present Contract, and without ignoring the stipulations of public order, the concepts defined in the Electricity Act, the electricity decrees and/or ordinances in relation to the organization of the electricity market and/or the various applicable Grid Codes and EU network codes and guidelines, as amended from time to time, are also included for the purposes of the Contract in the sense of these statutory or regulatory definitions.

In addition, the following definitions apply for the purposes of the Contract:

Access Point	For the purpose of this contract: <ul style="list-style-type: none"> As defined in art. 2 §1 29° of the Federal Grid Code for an access to the transmission grid of Elia; For an access to the Elia Grid other than transmission grid: a point, defined by physical location and voltage level, at which access to the Elia Grid other than transmission grid is granted, with a goal to injecting or taking off power, from an electricity generation unit, a consumption facility, a non-synchronous storage facility, connected to this grid;
Access Contract	As defined in art. 2 § 1 8° of the Federal Grid Code for an access to the transmission grid of Elia; for an access to the Elia Grid other than transmission grid, this means the contract between Elia and a Elia Grid User or a third party appointed by this Elia Grid User for the access of the installations of the Elia Grid User to the Elia Grid;
Access Contract Holder or "ACH"	The party requesting access to the Elia Grid who concludes the Access Contract with Elia;
Active Energy	As defined in art. 2 §1 14° of the Federal Grid Code;
Active Power	As defined in art. 2 (20) of the EU Commission Regulation (EU) 2016/631 of 14 April 2016 establishing a network code on requirements for grid connection of generators;
Automatic Control Service Type	Control of the Grid Voltage and Reactive Power by means of an automated and continuous modulation of the production/absorption of Reactive Power by the VSP in function of voltage measured at the Service Measurement Point;
Balance Responsible Party or "BRP"	As defined in art. 2 (7) of the EBGL and listed in the register of Balance Responsible Parties;
BRP Contract	The contract concluded between Elia and a BRP pursuant to art. 219 and 220 of the Federal Grid Code;



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Closed Distribution System or "CDS"	As defined in art. 2 §1 3° of the Federal Grid Code; For the purpose of this Contract, CDS refers to CDS connected to the Elia Grid;
CDS Operator or "CDSO"	A natural or legal person appointed by the relevant authority as the operator of the CDS;
CDS User	As defined in Art. 2 §1 58° of the Federal Grid Code;
CIPU Contract	The contract for the Coordination of Injection of Production Units concluded with Elia, or any other regulated contract(s) that will replace the CIPU Contract, in accordance with the dispositions in art. 377 of the Federal Grid Code;
Communication Test	A test in which Elia certifies the VSP's ability to exchange information that is necessary to execute the contract as per Annex 8;
Compensator Mode	The operation mode during which a Technical Unit provides the Automatic and/or Manual Control Service Type, at Elia's request, without any injection of while injecting less Active Power than its Minimum Active Power Threshold in injection or while offtaking less Active Power than its Minimum Active Power Threshold in offtake;
Connection Contract	The contract concluded between a Elia Grid User and Elia, as defined in art. 2 §1 9° of the Federal Grid Code;
Controlling Technical Unit	A Technical Unit that can participate in both the Automatic Control Service Type and the Manual Control Service Type as per art. 62 of the Federal Grid Code;
Day	Period of 24 hours starting at 00:00 CET morning until 24:00 CET;
Elia Grid	The electricity grid at which Elia holds the property right or at least a right of using and operating it, and for which Elia has been designated as system operator;
Elia Grid User	A Grid User connected to the Elia Grid;
Grid User	As defined in art. 2 §1 57° of the Federal Grid Code ;
Elia Grid User Declaration	The official declaration of the Elia Grid User provided to Elia containing proof of designation of a VSP by the Elia Grid User, as per letter template advised in Annex 11;
Federal Grid Code	The provisions of the Royal Decree of 22 April 2019, as amended from time to time, establishing a federal technical regulation for the management of and access to the transmission grid;

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Part II - Specific Conditions

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Grid Voltage or "GV"	The voltage at the Service Measurement Point;
Injection Mode	The operation mode during which a Technical Unit provides the Automatic and/or Manual Control Service Type, while injecting more Active Power than its Minimum Active Power Threshold in injection or while offtaking more Active Power than its Minimum Active Power Threshold in offtake) ;
Interconnection Point	As defined in art 2§1 32° of the Federal Grid Code;
Manual Control Service Type	Control of the Grid Voltage and Reactive Power by means of a step-wise modulation of the production/absorption of Reactive Power by the VSP following an explicit signal by Elia;
Minimum Active Power Threshold	Active Power beyond which a Technical Unit starts delivering the Service;
Technical Pmax or "P _{max_tech} "	A data that indicates the installed capacity (in MW) of a Technical Unit in line with articles 45 and 48 of the SOGL, as mentioned in the CIPUOPA Contract;
Month	Period starting at 00:00 the 1 st of the month until 24:00 the last day of the month;
Non-controlling Technical Unit	A Technical Unit that can participate only in the Manual Control Service Type, not falling under criteria for Controlling Technical Units as per art. 62 of the Federal Grid Code;
Offtake	Value indicating the offtake of Active Power at an Access Point. The term offtake is used to designate a certain sense of energy flow and does not exclusively refer to the technical means with which the Service is provided;
Open Qualification Procedure	A qualification procedure in accordance with public procurement rules in which candidates for provision of the Service are screened based on criteria set by ELIA in a publication on ted.europe.eu ; ;
Power Measured or "P _{measured} "	The net active power Active Power, i.e. the difference between gross offtake and gross injection, measured at a Service Measurement Point. Net offtake from the Elia Grid is considered as a positive value, net injection into the Elia Grid is considered as a negative value;
Public Distribution Grid	As defined in art.2, §1 49° of the Federal Grid Code;

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Part II - Specific Conditions

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Public Distribution Grid User	A Grid User connected to a Public Distribution Grid;
Distribution System Operator or "DSO"	As defined in art. 2, 11° of the Electricity Law;
Reactive Energy	As defined in art. 2 §1 15° of the Federal Grid Code
Reactive Power or "Q"	As defined in art. 2 (28) of the EU Commission Regulation (EU) 2016/631 of 14 April 2016 establishing a network code on requirements for grid connection of generators;
Reactive Power Required for Remuneration or Requested Or "Q _{req-rem} "	The volume of Reactive Power that is required as part of the provision requested (in MVar) for the activation of the Automatic Control Service Type and that will serve for the calculation of the/or the Manual Control Service remuneration Type;
Reactive Power Required for Delivery Control or Q _{req-control} RfG	The volume of Reactive Power that is required as part of the provision of the Service and that is calculated for delivery control; The Commission Regulation (EU) 2016/631 of 14 April 2016 establishing a network code on requirements for grid connection of generators;
Sensitivity Coefficient (α_{eq})	As defined in Art. 67 of the Federal Grid Code
Setpoint	The control variable of a certain Technical Unit at a certain moment, defining the relation between voltage and regulation of Reactive Power, expressed in MVar. The Setpoint, as ordered by Elia according to modalities in Annex 8 describes the requested stepwise regulation of the Technical Unit's production or absorption of Reactive Power as per the Automatic and Manual Control Service Types;
Service Type	Manual Control or Automatic Control services, who together form the Voltage and Reactive Power Control Service;
Service Measurement Point	A point within an electric grid or within the grid of a Elia Grid User , taken as a reference for measuring the delivery of the Service as per Art.1.1.1 a);
Prequalification Test	A test performed prior to Service provision according to the modalities in Art.II.3.3;
Technical Control Band in Compensator Mode	The Reactive Power that can be produced or absorbed at Elia's request, within the technically possible operating limits as described in Annex 1, for a Technical Unit operating in Compensator Mode;
Technical Control Band in injection mode Injection Mode	The Reactive Power that can be produced or absorbed at Elia's request, within the technically possible operating limits as

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	described in Annex 1, for a Technical Unit operating in injection mode ; Injection Mode;
Technical Unit	A facility connected to the Elia Grid, to a Public Distribution Grid or to a CDS able to provide Reactive Power and Voltage Control Services to Elia through a VSP;
Contract for the Outage Planning Agent or "OPA Contract"	The contract between Elia and the Outage Planning Agent in accordance with article 244 of the Federal Grid Code.
Contract for the Scheduling Agent or "SA Contract"	The contract between Elia and the Scheduling Agent in accordance with article 249 of the Federal Grid Code.
Voltage and Reactive Power Control Service or "Service"	The Service constituted by the Manual Control and/or the Automatic Control Service Types;
▲ Voltage Service Provider or "VSP"	Any natural person or legal entity, as defined in art. 234 of the Federal Grid Code, and with whom Elia has concluded a contract to provide the Voltage and Reactive Power Control Service;
Week	Period starting at 00:00 Monday morning until 24:00 the next Sunday;

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TITLE 2: CONDITIONS FOR PARTICIPATION TO THE SERVICE

ART. II.2 CONDITIONS FOR VSP

II.2.1 Designation procedure of the VSP by the Elia Grid User

In accordance with art. 234, 5th al., of the Federal Grid Code, the VSP is the Elia Grid User of Technical Units providing the Service or a third party appointed by the Elia Grid User as VSP. In case of the designation by the Elia Grid User of a third party, the VSP must provide Elia with a copy of the Elia Grid User Declaration as figuring in Annex 11 signed by the Elia Grid User and the VSP.

II.2.2 Should the VSP for a certain Technical Unit change, the new party assuming his role also assumes the obligations deriving from this Contract.

II.2.3 When one or more of the Technical Units listed in Annex 1 is/are transferred to another VSP the VSP shall collaborate with the Elia Grid User(s) of the Technical Unit(s) to ensure correct transfer of the Technical Unit to the new VSP by providing all necessary information.

II.2.4 In application of art. 234, 4th al., of the Federal Grid Code, when the Service is delivered at an Access Point of a CDS, the relevant CDSO has the exclusive right to deliver the Service to Elia by undertaking the role of a VSP, or by appointing a VSP. If the CDSO provides the Service with Technical Units from a CDS User, Elia requires a proof of an agreement signed by both parties before the VSP starts delivering the Service.

II.2.5 In application of art. 234, 4th al., of the Federal Grid Code, when the Service is delivered at an Interconnection Point, the relevant DSO has the exclusive right to deliver the Service to Elia by undertaking the role of a VSP, or by appointing a VSP. If the DSO provides the Service with Technical Units from a Public Distribution Grid User, Elia requires a proof of an agreement signed by both parties before the VSP starts delivering the Service.

II.2.6 Open qualification Procedure

Prior to submitting an offer to provide the Service, the VSP has satisfied the following conditions to become a qualified VSP:

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- 1) Provision of a declaration (referred to as "sworn statement") in which the VSP declares the fulfilment of the obligations related to payment of social security contributions in accordance with the legal provisions, fulfilment of the obligations related to payment of taxes in accordance with the legal provisions, and situation of non-bankruptcy.
- 2) Proof of a sound financial and economical situation of the candidate.

The VSP has applied by submitting a completed application form and the required documents, for the applicable Service to Elia. The application form and the template for the sworn statement can be downloaded on Elia's website or requested by e-mail to contracting_as@elia.be, with the contractual responsible as designated in Annex 10 in copy.

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The VSP shall comply with the conditions set forth in the Open Qualification Procedure.

If it is confirmed that the VSP no longer complies with above conditions Elia will notify the VSP via a registered letter. If after 15 working days after reception of notification the VSP remains uncompliant to these conditions, ~~he will be excluded from the participation of the VSP in the Service~~ ~~without prejudice to Art. II.3.3 k)~~ and ~~his~~ remuneration will be suspended until compliance with these conditions has been fully restored.



ART. II.3 CONDITIONS FOR TECHNICAL UNITS

- II.3.1 The VSP operates Technical Units that are able to ~~generate~~produce and/or absorb the Reactive Power to and from the Elia Grid or has concluded an agreement with one or more Elia Grid User(s) that operate(s) Technical Units that are able to ~~generate~~produce and/or absorb the Reactive Power to and from the Elia Grid.
- II.3.2 The Technical Units used by the VSP to provide the Service are listed in Annex 1 (including the necessary technical and measurement information). The list of these Technical Units may change at any time subject to agreement by and between the Parties throughout the term of the Service delivery period.
- II.3.3 The Technical Unit may participate in the Service under the following conditions:

Technical requirements

- a) The Technical Units ~~participating in the Service~~ shall meet the requirements of the articles of the Federal Grid Code and of the requirements of general application in accordance with article 7(4) of the RfG related to the ~~the~~Service as defined in the table below and, for the automatic service, comply with the relative Sensitivity Coefficient α_{eq} . The Sensitivity Coefficient is determined by Elia following discussions between Elia and the VSP as described in Annex 13 and in coherence with the criteria defined to that end in the Connection Contract (in which the technical characteristics of the Technical Unit are described). This coefficient is set in Annex 1.

Technical Unit	Articles from the Federal Grid Code	Articles from the requirements of general application in accordance with article 7(4) of the RfG ¹
New Type B,C,D SPGM	Art. 89 and 234	Art. 4.3.1/5.5.1
New Type B,C,D PPM	Art. 93 and 234	Art. 4.4.2/5.6.2
New Type B, C, D SPM	Art. 99 and 234	n.a. ²
New HVDC interconnector	Art. 104 and 234	
New generators connected on a HVDC link	Art. 106 and 234	
New HVDC conversion stations at isolated extremity	Art. 107 and 234	

² This table may be subject to evolutions of the legislation framework such as the adaptation of the regional grid codes



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New offshore generators with onshore connection points	Art. 118, 119 and 234
New offshore generators with offshore connection points	Art. 130, 131 and 234
Existing generator type C,D	Art. 62 to 68 and 234
Existing generator type B	Art. 62 to 68 and 234
Direct clients demand facilities	Art. 234

Figure 1: Relevant articles concerning the requirements in terms of voltage and Reactive Power control capabilities applicable to different types of Technical Units

- b) Elia is entitled to evaluate, at any time during the Service delivery period, whether the ~~VSP complies~~ Technical Units comply with the conditions mentioned in Art. ~~II.3.3~~II.3.3 a). For the avoidance of doubt, this does not entail any right for Elia to physically access the VSP's assets without prejudice to any other regulation, i.e. the Federal Grid Code, regarding access to the Elia Grid User's connection installations. If Elia establishes that ~~the VSP fails~~(a) Technical Unit(s) fail(s) to comply with these conditions, ~~he will be excluded from the participation in the Service without prejudice to Art. II.3.3 k)~~of the concerned Technical Unit(s) and ~~his~~the corresponding remuneration will be suspended until compliance has been fully restored.

Communication Test

- c) Before the beginning of Service delivery with a Technical Unit, the VSP of this Technical Unit must perform a Communication Test to verify the correct exchange of messages as per ~~Annex 8~~Art. II.5.4 and II.5.5. The Service may not be delivered before successful completion of such a test.
- d) The VSP undertakes to maintain communication means and processes operational at all times. If Elia notices that communication means and processes do not meet the requirements anymore, it may request performance of a new Communication Test, within a reasonable timeframe, until which Service delivery (and payment thereof) remains suspended. If Elia establishes that the VSP fails to comply with the Communication Test, ~~he will be excluded from the participation in the Service without prejudice to Art. II.3.3 k)~~of the concerned Technical Unit(s) and ~~his~~the corresponding remuneration will be suspended until a successful new Communication Test has been completed.
- e) ~~In such case, the VSP has to successfully complete a new Communication Test within a reasonable timeframe in order to be considered as available by Elia.~~

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Prequalification Test

- f) Before the beginning of Service delivery, Elia shall request a Prequalification Test to verify the characteristics of the Service delivery by each Technical Unit.
- g) This test will at least involve an activation of the Service in which the VSP must provide the Service under conditions foreseen in the present Contract. Exact test modalities are described in Annex 13



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- h)g) The Prequalification Test will confirm the Reactive Power Technical Control Band made available, measurement modalities together with the modalities for calculation of Q_{req_rem} (as per Annex 2) ~~and $Q_{req_control}$ (as per Annex 3 and Annex 4).~~
- h)h) The Prequalification Test will not be considered as an activation of the Service.
- h)i) Elia reserves the right to abort the Prequalification Test at any moment if it jeopardizes the security of the Elia Grid.

Compliance

- h)j) ~~If in case of non-compliance with one or more of the VSP is obliged to provide the Service according to provisions of the Federal Grid Code and he becomes excluded from the Service for the reasons stated obligations in the present Article, he will be considered as non-compliant with its obligation. In such events, II.3.3 a) to i), the VSP shall take all necessary actions to become compliant to aforementioned obligations again as soon as possible.~~

II.3.4 ~~All Technical Units participating in the Service must respect the following conditions:~~

II.3.4 ~~The VSP shall deliver the Service identified by using a Service Measurement Point:~~

- a) A Service Measurement Point may correspond to:
 - o for Technical Units connected to the Elia Grid or a CDS : the Access Point to the Elia Grid; In exceptional circumstances following proposal by Elia and agreement of the VSP, ~~during the prequalification procedure as specified in Annex 13, the Service Measurement point~~Point may be a point downstream from this Access Point and associated to measurement and metering devices ~~as specified in Annex 13;~~
 - o for Technical Units located in a Public Distribution grid: the Interconnection Point (at the high-voltage side of the Interconnection Point transformer) ;

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These Service Measurement Points will be used as a reference for remuneration, delivery control and the provision of the Service by Technical Units according to modalities described in the present Contract.

~~Technical Units delivering the Service shall always be associated to a specific Access Point² or Interconnection Point, that will be considered as the Service Measurement Point. Elia and the VSP must agree on the modalities for the measurement of the Reactive Energy and Reactive Power on the basis of which the Service shall be remunerated and controlled. The procedure and criteria under which these modalities shall be determined are described in Annex 13.~~

~~Independently from the Service Measurement Point, Service provision is linked to a Technical Unit for which the VSP must provide all information required in Annex 1. For Technical Units providing the Automatic Control Service Type, remuneration and delivery control as per Art. II.7, Art. II.8, and Art. II.9 shall be performed separately for each Technical Unit.~~

- b) Cumulated measures for several Technical Units at a certain Service Measurement Point may be considered under the following conditions:
 - o all Technical Units behind the Service Measurement Point are represented by the same VSP;

²Taking into account the exceptions as per art. II.3.3 a) 1st §



Part II - Specific Conditions

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- o a cumulated regulation effect is demonstrable and measurable at the Service Measurement Point;
- o the VSP must demonstrate that provision of the Service at the Service Measurement Point is not influenced in an unpredictable way by other Technical Units or local grid elements downstream from the Service Measurement Point;
- ~~o in case the~~All Technical Units that are PGM's or PPM's:
- ~~o the VSP communicates to Elia are equipped with real-time~~ Active Power measurements for each Technical Unit providing the Service behind the Service Measurement Point;

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When all above conditions are fulfilled, the cumulated Q_{req_rem} and $Q_{req_control}$ of these Technical Units may be used to remunerate and control Service delivery as provided in Art. II.7, Art. II.8, and Art. II.9 and after agreement with Elia (following the analysis foreseen in Annex 13).

e)II.3.5 A Technical Unit supplying the Service cannot be a part of a strategic reserve contract.

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e)II.3.6 Elia reserves the right to disqualify a Technical Unit if its participation in the Service jeopardizes the Elia Grid security after justification.

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e)II.3.7 ~~The VSP declares that the~~ Technical Units are related to Access Point(s) included in valid Access Contract(s) ~~are in the Perimeter of a BRP having a valid BRP Contract.~~

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II.3.5II.3.8 Update of Annex 1:

The agreed list of Technical Units based on the template in Annex 1 should at all times be kept up to date by the VSP.

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The agreed list of Technical Units may be modified by the VSP by submitting an updated list based on the template in Annex 1 via e-mail to the contractual responsible of Elia as mentioned in Annex 10 under the following conditions:

- At the moment of the notification, the Technical Units must be in respect with the applicable conditions set in Art. ~~II.3.3~~II.3.3 and Art. I.1.1
- The updated list of Technical Units becomes effective at the beginning of the next Month following the notification of acceptance by Elia.

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II.3-6II.3.9 Each Technical Unit must provide Elia a **Technical Control Band** with a minimum volume of 1 MVar for ~~generation~~production or absorption of **Reactive Power**.

II.3.10 For each Technical Unit participating to the Service in both Injection and Compensator Modes, the **Technical Control Band** in Injection Mode must be equal to the **Technical Control Band** in Compensator Mode.

II.3.11 If the VSP is not designated as Access Contract Holder for the Access Point related to the concerned Technical Unit, the VSP shall hold a bilateral agreement with the Access Contract Holder, acknowledging and accepting the specific modalities of Service delivery that may interfere with the application of the access tariffs⁴, and in particular, the correction applied to the offtake or injection of additional reactive energy as per section 2.2 of the access tariffs and the power put at disposal as per section 1.3 of the access tariffs. As part of this agreement the Access Contract Holder and VSP agree to settle any financial and data flows resulting from provision of the Service between them, without informing Elia and without Elia's arbitration. The VSP shall provide evidence of this agreement to Elia. If the VSP does not provide such an evidence, the participation in the Service of the concerned Technical Unit cannot start and the Technical Unit cannot be included in Annex 1.

II.3-7II.3.12 **Controlling Technical Units**

- a) The Controlling Technical Units participate in Automatic Control Service Type and in Manual Control Service Type, in particular under the conditions of articles 62 to 68 of the Federal Grid Code and in accordance with the provisions in the present Article.
- b) For these Technical Units, Reactive Power is ~~generated~~produced or absorbed:
 - o automatically, during slow (minute) or sudden (second) variations in the Grid Voltage; and
 - o as the case may be, by changing the Setpoint of the automatic voltage regulator at Elia's request.
- c) Each Controlling Technical Unit may absorb or ~~generate~~produce Reactive Power between the technical minimum ($Q_{\text{tech min}}$ or $Q_{\text{tech-}}$) and the technical maximum ($Q_{\text{tech max}}$ or $Q_{\text{tech+}}$) specified in Annex 1 for a normal operating voltage at the **AccessService Measurement Point**.
- d) Each Controlling Technical Unit may absorb or ~~generate~~produce Reactive Power as per Art.**II.3-7**. II.3.12 c) for each voltage at the Access Point between 0,925 and 1,05 times the normal operation voltage, except if a limit is defined after consultation by and between the parties following the voltage limitations of the generator or following the stator current of the generator.
Any stator current limitation at steady state shall not impede operation of the voltage control.
- e) Within the operating range defined in Articles **II.3-7II.3.12 c)** and **II.3-7II.3.12 d)**, each Controlling Technical Unit shall be able to adjust its Reactive Power automatically in the event of Grid Voltage variations at the Access Point, according to a relative Sensitivity Coefficient α_{eq} that is determined by Elia following discussions between Elia and the VSP as described in Annex 13. The relative Sensitivity Coefficient of each Controlling Technical Unit is specified in Annex 1. It is the VSP's obligation to ensure that the relative Sensitivity Coefficient value corresponds at all times to reality. If necessary, the VSP may ask Elia to perform joint tests at his expense to validate the relative Sensitivity Coefficient. The VSP can update the relative Sensitivity Coefficient of each controlling

⁴ "Tarifs pour l'accès au réseau 2020 – 2023" that can be consulted on the Elia website: <https://www.elia.be/fr/clients/facturation-et-tarifs>

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19/67
V1/2020

[ContractReference]
[ServiceProvider]
Signature [VSP]:



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Technical Unit in Annex 1 after providing a technical justification and with the agreement of Elia.

3.8.13.13 Non-controlling Technical Units

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A Non-controlling Technical Unit participates only in Manual Control Service Type. It must be able to adapt its supply of Reactive Power between two levels agreed between Elia and the VSP. ~~These two levels are~~ The Technical Control Band is defined in Annex 1.

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TITLE 3: ACTIVATION

ART. II.4 ACTIVATION OF AUTOMATIC CONTROL SERVICE TYPE

- II.4.1 The Automatic Control Service Type is to be activated without interruption when a Controlling Technical Unit is injecting or **offtaking** Active Power above or **equal to** its Minimum Active Power Threshold (as agreed in Annex 1).
- II.4.2 Controlling Technical Units deliver the Automatic Control Service Type in accordance with Art. ~~II.3.7~~ II.3.12

ART. II.5 ACTIVATION OF MANUAL CONTROL SERVICE TYPE

- II.5.1 The Manual Control Service Type is to be available for activation without interruption when a Technical Unit is injecting or **offtaking** Active Power above or **equal to** its Minimum Active Power Threshold (as agreed in Annex 1).
- II.5.2 Elia may request a Technical Unit listed in Annex 1, in real time, to adjust its Setpoint from the time it is available in accordance with the provisions of Art. ~~II.3.7~~ II.3.12 and II.3.13 (request hereinafter referred to as '**manual** activation').
- II.5.3 Elia will activate in priority Technical Units with the objective of reducing total Service costs, in consideration of the following ~~constraint~~ **elements**:
 - o the location of the Technical Unit in the grid and the voltage level at which it is connected ;
 - o activation prices;
 - o the supply of Reactive Power from the automatic reaction of the machine or a previous Setpoint communicated by Elia;
 - o **Elia may also consider** other technical requirements encountered at such time ~~as for example~~:
 - o **the scheduled Active Power of the Technical Unit to identify how long a Technical Unit is still available to provide the Service after the Setpoint request**
 - o **the Technical Control Band of the Technical Unit and the margins that left after the request of the Setpoint.**

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- II.5.4 Elia shall communicate a Setpoint to the VSP for the Technical Unit(s) selected under the conditions described in Article II.5.3. The Setpoint shall be communicated by a B2B request message from Elia to the VSP.

The VSP shall electronically confirm receipt of the Setpoint in maximum 10 seconds. In case of absence of confirmation, the **manual** activation will be considered as failed and a remuneration reduction will apply as per Annex 7.

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The VSP shall have a maximum period of 5 minutes to attain the Setpoint of the Technical Unit(s) concerned from the time said value is sent by Elia.



Part II - Specific Conditions

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II.5.5 Elia shall request the activation of Manual Control Service Type by sending the VSP a Setpoint with at least the following information:

- o the selected Technical Unit(s);
- o the new Setpoint to be applied, in terms of a Reactive Power value (expressed in MVar) to be attained within the time limit defined in Art. II.5.4 for this Technical Unit.

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II.5.6 Once the volume of Reactive Power desired by Elia is attained by the Technical Unit, the latter may no longer change its Setpoint and only the automatic regulator may change the injected/produced or absorbed Reactive Power, until Elia sends a new Setpoint.

II.5.7 Where Elia does not send a Setpoint to the VSP, the Controlling Technical Unit shall operate from a reference Setpoint set by Elia and the VSP in Annex 1, corresponding to a volume of Reactive Power expressed in MVar and measured at the Service Measurement Point. Unless agreed differently in Annex 1, this Setpoint is considered to be 0MVar.

II.5.8 Once a Technical Unit has been restarted and is injecting Active Power above its Minimum Active Power Threshold, irrespective of the last Setpoint sent by Elia, it is agreed that the Technical Unit shall supply the Service based on the Reference Setpoint set in Annex 1.

II.5.9 ~~Even when~~When the Technical Unit is ~~not delivering the Service because it~~ is injecting or ~~offtaking~~ less than its Minimum Active Power Threshold (as agreed in Annex 1), Elia may request via an explicit order that the Technical Unit stops producing or absorbing Reactive Power.

II.5.10 The ~~procedure~~procedures for exchanging a Setpoint between Elia and the VSP are described in detail in Annex 8.

ART. II.6 EXCHANGE OF INFORMATION

II.6.1 In any case and for all Technical Units, the VSP must notify to Elia the grid topology, configuration of metering equipment and the resulting modalities of delivery of Reactive Power. In this regard, he must provide Elia with all relevant requested information.

II.6.2 The VSP agrees that metering data from Elia, ~~the DSO~~ or the CDS Operator⁵, shall be used as the basis for the settlement as specified in Art. II.8 and Art. II.9.

II.6.3 The VSP has the responsibility to be able to interpret messages received correctly and respond accordingly at all times.

II.6.4 The VSP has the obligation to pro-actively maintain in good functioning order the communication channels ~~described in Annex 8 for the correct exchange of messages as per Art. II.5.4~~. Any failure of activation due to unavailability or dysfunction of these communication channels (without fault by Elia) will be the VSP's sole responsibility.

II.6.5 Elia reserves the right to request regular Communication Tests such as described in Art. II.3.3 to check whether the communication channels ~~for the correct exchange of messages as described in -per Art. Annex 8~~II.5.4 are operational.

II.6.5

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⁵ By default the Service Measurement Point is located at the Access Point or Interconnection Point meaning the Elia metering data shall be used. If the Service Measurement Point is located inside a ~~Distribution Grid~~ Or a CDS, the CDSO metering data ~~from the DSO, respectively the CDSO~~ shall be used.



Part II - Specific Conditions

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- II.6.6 The exchange of information for the performance of the Service will be directed to the respective contact persons of the Parties, as mentioned in Annex 10.
- II.6.7 Any restriction (forecasted or not) in the ~~reactive power~~Reactive Power control capability is to be communicated via telephone and ~~email~~-mail by and between the contact persons identified in Annex 10 as soon as possible.
- II.6.8 In the event of technical problems with electronic data interchange in the context of the Manual Control Service Type , the Parties shall use telephone communications as a back-up solution.



TITLE 4: ACTIVATION CONTROL

ART. II.7 ACTIVATION CONTROL

II.7.1 Automatic Control Service Type

- a) Pursuant to Art. II.3.10, each Controlling Technical Unit must be able to adjust its Reactive Power ~~injection~~production or absorption automatically in the event of Grid Voltage variation at its Service Measurement Point, in accordance with the relative Sensitivity Coefficient α_{eq} as defined in Annex 1.
- b) To ensure that the automatic regulator of a Controlling Technical Unit provides the Automatic Control Service Type correctly, Elia verifies whether the Reactive Power actually supplied by the Technical Unit corresponds to the Reactive Power that should have been supplied in response to variations of the Grid Voltage measured at that same Service Measurement Point.

~~For Technical Units located behind Access Points connected to the Elia Grid this control may be performed as per Art. II.3.4a) at a measuring point other than the Access Point, to be agreed between Elia and the VSP, provided that the said measurement gives sufficient information to calculate Reactive Power provided at the retained measuring point. This modality is to be decided in common between Elia and the VSP before the beginning of Service delivery as per procedure described in Annex 13. Performing this control at the Access Point is by default the prioritized option. For Interconnection Points this control shall always be performed at the high-voltage side of the Interconnection Point transformer.~~

- c) Elia uses quarter-hourly metering data to carry out this verification monthly for each Technical Unit ~~for delivery~~ in Month M-2, starting out with six samples. Each sample pertains to a 5-hour period. Elia applies the penalty described in Art. II.9.1 where necessary.
- d) Delivery control criteria, modalities and non-supplied volume calculation for the Automatic Control Service Type are described in Annex 3.
- e) In any case, Grid Voltage according to which regulation is performed is measured at the Service Measurement Point according to modalities of Art. II.6.

II.7.2 Manual Control Service Type

- a) Pursuant to Art. ~~II.3.8, each~~II.3.12 and II.3.13, each Controlling and Non-Controlling Technical Unit must be able to adjust its Reactive Power ~~injection~~production or absorption upon request by Elia as per Art. II.5.4.
- b) To ensure that ~~the~~ Controlling or Non-Controlling Technical Unit provides the Manual Control Service Type correctly, Elia shall check whether the corresponding Reactive Power was supplied correctly ~~at the Service Measurement Point~~ by the selected Technical Unit within the timeframe mentioned in Art. II.5.4.

To this end, Elia shall use the 30" remote measurements (or the most precise measurements available) at the Service Measurement Point of:

- o the Grid Voltage (GV);
- o the Reactive Power supplied (Q).

~~For Technical Units located behind Access Points connected to the Elia Grid this control may be performed as per Art. II.3.4a) at a measuring point other than the Access Point, to be agreed between Elia and the VSP, provided that the said measurement gives~~



Part II - Specific Conditions

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~~sufficient information to calculate Reactive Power provided at the retained measuring point. This modality is to be decided in common between Elia and the VSP before beginning of Service delivery as per procedure described in Annex 13. Performing this control at the Access Point is by default the prioritized option. For Interconnection Points, this control shall always be performed at the high-voltage side of the Interconnection Point transformer.~~

- c) Elia shall carry out this verification monthly for each Technical Unit **for delivery** in Month M-2 on six samples of activation requests by Elia over six different days. Elia shall apply a penalty as described in Art. II.9.1 where necessary.
- d) Elia shall select for this verification the activation requests pertaining to a minimum volume of 5% of Q_{tech} max (value defined in Annex 1) when the interval with the following activation request is superior to 5 minutes.
- e) Delivery control criteria and non-supplied volume calculation for the Manual Control Service Type are described in Annex 4.

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TITLE 5: REMUNERATION AND PENALTIES

ART. II.8 REMUNERATION

- II.8.1 Following article ~~12-quinquies~~^{12quinquies} of the Electricity ~~Law of 29 April 1999~~Act, prices can be fixed by means of Royal Decree. In such an event, prices fixed by the Royal Decree become applicable and prevail over prices fixed according to ~~Annex 12-Applicable Prices~~ Annex 12.B .
- II.8.2 Elia starts remunerating the Service for a Technical Unit provided that the conditions set in Art. II.3 are satisfied.
- II.8.3 The remuneration for the Service, without prejudice to any penalties defined in Art.II.9.1, shall consist of the remuneration for the activation costs for each Technical Unit and will depend on the price (as agreed in Annex 12) and $Q_{req-rem}$ volume for both Automatic and Manual Control Service Types for each quarter-hour.
- II.8.4 The remuneration basis is the Reactive Power ~~Required~~Requested (or $Q_{req-rem}$), calculated as per Annex 2 meaning a volume of MVAR that ~~correspond~~corresponds to Elia's regulation need at the given quarter-hour.

~~The VSP shall hold 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 proposal⁶. In particular this bilateral agreement takes into account the fact that $Q_{req-rem}$ will be also applied to calculate the tariff for the offtake or injection of additional reactive energy, as per modalities mentioned in Elia's tariff proposal. As part of this agreement the Access Contract Holder and VSP agree to settle any financial and data flows resulting from provision of the Service between them, without informing Elia and without Elia's arbitration. The VSP shall provide evidence of this agreement to Elia.~~

- II.8.5 The ~~VSP may~~remuneration for the Service can also ~~request~~consist of a compensation of ~~his~~the costs related to an increase of the tariff for power put at disposal for offtake (PPAD) due to the delivery of the Service.~~This, provided that such compensation should be~~was integrated in the VSP offer with a detail of the additional supported costs.

ART. II.9 PENALTIES

- II.9.1 If Elia establishes, based on activation controls for each Service Type ~~as these are described in~~according to Art. II.7, Annex 3 and Annex 4, that the VSP has failed for a particular quarter-hour to activate at least the quantity of $Q_{req-control}$ ~~by the Service~~ , Elia applies a penalty as described in Annex 6 and/or Annex 7.
- II.9.2 The sum of the penalties under Art.II.9.1 will be subject to a monthly cap, without prejudice to any liability on the part of the VSP for the non-fulfillment of his obligations in accordance with Art. I.6 of the General Conditions. The penalty for each month may not exceed the VSP's remuneration for the Service for this month for the concerned Technical Unit or the aggregation of Technical Units as per Art. I.1.1 b).

⁶ ~~e.g. tariff for the offtake or injection of additional reactive energy or tariff for power put at disposal~~



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TITLE 6: INVOICING

ART. II.10 INVOICING AND PAYMENT

- II.10.1 Via a joint validation platform or other agreed channel, Elia will present the VSP a report, by or before the fifteenth day of Month M, related to the monitoring of the Reactive Power provided by the VSP in Month M-2. This report will indicate, amongst others, all penalties for Month M-2 as calculated by Elia in accordance with Art. II.9.1, showing the method of calculation and all data on which the calculation is based.
- II.10.2 The VSP shall send the pro-forma invoice to Elia, to the contact persons in Annex 10 by or before the 25th (twenty-fifth) day of each Month M. The pro-forma invoice shall indicate in particular:
- o the remuneration for the activation of the Service in Month M-2, calculated in accordance with Art. II.8;
 - o where applicable, the amount of the penalties in Month M-2, as calculated by Elia in accordance with Art.II.9.1;
 - o the items in accordance with Art. I.5.1 of the General Conditions.
- II.10.3 Elia shall either approve or reject the pro-forma invoice within 5 working days of receiving it. In accordance with the pro-forma invoice, the invoice may be sent to the Invoicing & Payment department after Elia has approved the pro-forma invoice or after 5 working days without response.
- II.10.4 Disputes from the VSP regarding the report and penalties stipulated in Art. II.9 must be reported within 25 calendar days starting from the day following Elia's submission of the respective report. Should this occur, the Parties shall enter into negotiations with each other with a view to reach an agreement in accordance with Art. I.13 of the General Conditions.
- II.10.5 If no agreement can be reached:
- o the VSP, when drawing up his pro-forma invoice for Month M, shall take account of the penalties calculated by Elia;
 - o the Parties shall continue their negotiations with a view to reaching an amiable arrangement and, after concluding their agreement, settle this invoice ex-post;
 - o if no amiable arrangement is reached, the dispute settlement procedure set out in Art. I.13 of the General Conditions shall apply.
- II.10.6 Annex 9 includes the appropriation structure to be used by the VSP.



Part II - Specific Conditions

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The Parties agree that this Contract is valid from its date of signature until 31/12/2022-DD/MM/YYYY

Drawn up in Brussels in two originals, of which each Party concerned acknowledges having received one. The official version has been drawn up in Dutch and French, without one version taking precedence over the other; the English version is solely for information purposes.

ELIA Transmission Belgium N.V./S.A., represented by:

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Date:

Date:

[ServiceProvider], represented by:

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PART III - ANNEXES



Annex 1 List of controlling and/or non-controlling Technical Units

ANNEX 1. LIST OF CONTROLLING AND/OR NON-CONTROLLING TECHNICAL UNITS

Name: [VSP]

Version: [date submission VSP]

Validity Period: [start] – [end]

In accordance with Art. II.3.2 the VSP must declare the Technical Units on which he will make the Service available.

The Technical Units must be in respect with all the conditions set forth in Art. I.1.1.

This list must be presented by the VSP to Elia and must be agreed between both Parties.

Updates of this list must be exchanged, following the rules set forth in Art.II.3.8, and agreed upon via email to the contracting responsible as per Annex 10.

The fact of being listed in the present Annex does not constitute a right of access for the said Technical Units.

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2021-11-12
Signature Elia:

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V1/2020

[ContractReference]
[ServiceProvider]
Signature [VSP]:



Annex 1 List of controlling and/or non-controlling Technical Units

Technical Unit	Service Measurement Point EAN	Controlling (C) or Non-controlling (NC)	Technical control band in injection mode Injection Mode (MVar)				Technical control band in Compensator Mode (MVar)				Sensitivity Coefficient α_{eq}	Reference Setpoint (MVar)	Minimum Active Power Threshold (MW) to be able to supply the Technical Control Band (Group 1) in Injection Mode	Minimum Active Power Threshold (MW) to operate in Compensator Mode (Group 2)	Maximum Active Power Threshold (MW) to operate in Compensator Mode (Group 2)
			$Q_{tech\ min}$	Q3	Q1	$Q_{tech\ max}$	$Q_{tech\ min}$	Q3	Q1	$Q_{tech\ max}$					

With:

- $Q_{tech\ min}$ (or Q_{tech-}): technical minimum that can be absorbed or ~~generated~~ produced by the unit and defining the Technical Control Band
- Q3: Value expressed in % of the $Q_{tech\ min}$ used in order to split the Technical Control Band into two price bands following conditions described in annex 12
- Q1: Value expressed in % of the $Q_{tech\ max}$ used in order to split the Technical Control Band into two price bands following conditions described in annex 12
- $Q_{tech\ max}$ (or Q_{tech+}): technical maximum that can be absorbed or ~~generated~~ produced by the unit and defining the Technical Control ~~Band~~
- Reference set point: set point in which, the Controlling Technical Unit is supposed to operate when Elia does not send a Setpoint to the VSP

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V1/2020

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Signature [VSP]:



ANNEX 2. CALCULATION OF REMUNERATION OF THE SERVICE

The calculation of the power that Elia requires from the VSP is the basis for the Service remuneration.

The remuneration for each quarter-hour is dependent on the Q_{req_rem} value, and the price component applicable for the specific quarter hour as defined in Annex 12

$$Remuneration(Qh_n) = \frac{Q_{req_rem}(Qh_n)}{Q_{req_rem}} Q_{req}(Qh_n) * \frac{1}{4} * Price(Qh_n)$$

Where:

- $Q_{req_rem}(Qh_n)$: the **required**-Reactive Power **Requested** that is remunerated for the quarter-hour n as computed in this annex
- $Price(Qh_n)$: the price of Reactive **Energy** for quarter-hour n as determined per Annex 12
- Qh_n : the considered quarter-hour

2.A CALCULATION OF Q_{REQ_REM}

Q_{req} shall be calculated by the following formula:

- For Controlling Technical Units:

- During qh where no setpoint is received by the technical unit

$$Q_{req} = - \frac{(GV(t) - V_{startup}) * \alpha_{eq} * 0.45 * P_{tech_max}}{U_{norm_exp}} + Q_{initial} \quad (1)$$

- During qh during which a setpoint is received by the technical unit

$$Q_{req} = Q_{req_manual} \quad (2)$$

- For Non-controlling Technical Units:

$$Q_{req} = Q_{req_manual}$$

Where:

- GV(t): the average value of the Grid Voltage measurement at the Service Measurement Point for the specific quarter-hour controlled;
- $V_{startup}$: as defined below in the present Annex;
- Q_{req_manual} : the last Setpoint value communicated by Elia as described in Annex 8;
- $Q_{initial}$: the Reactive Power measured at the quarter-hour following the quarter-hour at which the Controlling Technical Unit started up for the last time (meaning the last moment in time where the Technical Unit's Active Power injection or offtake value started to exceed its Minimum Active Power Threshold value as agreed in Annex 1) or after a manual Setpoint is reached.
- U_{norm_exp} : the standard operational Grid Voltage under which the Technical Unit is foreseen to operate, as agreed in the Technical Unit's Connection Contract;

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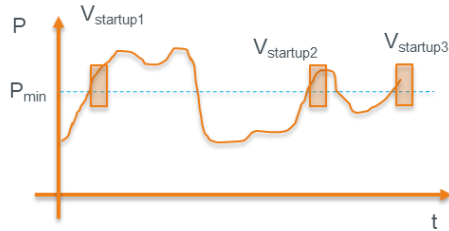
Annex 2 Calculation of remuneration of the Service

- $P_{tech,max}$: a data that indicates the installed capacity (in MW) of a Technical Unit in line with articles 45 and 48 of the SOGL, as mentioned in the OPA Contract;

Automatic Control Service Type

The Automatic Control Service Type reaction of a certain Technical Unit is determined by the Grid Voltage and by the Technical Unit's capacity to react to it according to its relative Sensitivity Coefficient (α_{eq}). MVAR's ~~required~~requested are considered to be MVAR's that are produced or absorbed when the Grid Voltage deviates from $V_{startup}$ (as defined in the present Annex).

$V_{startup}$ is 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~~Active Power injection or offtake value ~~exceeded~~started to exceed its Minimum Active Power Threshold (P_{min} in Figure 2) value as agreed in Annex 1). $V_{startup}$ is also reinitialized at the quarter-hour following a Setpoint ~~change~~request using the ~~voltage~~Grid Voltage measured at this quarter-hour. $V_{startup}$, together with α_{eq} characterize the Technical Unit's droop curve.



- ~~Figure 2: Example of calculation of $V_{startup}$ in function of the evolution of $P(t)$~~

~~$Q_{req,rem}$ shall be calculated by the following formula:~~

- ~~For Controlling Technical Units:~~

- ~~During qh where no setpoint is received by the technical unit~~

$$Q_{req,rem} = - \frac{(GV(t) - V_{startup}) * \alpha_{eq} * 0.45 * P_{tech,max}}{U_{norm,exp}} + Q_{initial} \quad (1)$$

- ~~During qh during which a setpoint is received by the technical unit~~

$$Q_{req,rem} = Q_{req,manual} \quad (2)$$

- ~~For Non-controlling Technical Units:~~

$$Q_{req,rem} = Q_{req,manual}$$

Where:

- ~~$GV(t)$: the average value of the Grid Voltage measurement at the Service Measurement Point for the specific quarter-hour controlled;~~
- ~~$V_{startup}$: as defined in the present Annex;~~

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Annex 2 Calculation of remuneration of the Service

~~Q_{req_manual} : the last Setpoint change value communicated by Elia as described in Annex 8.~~

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$Q_{initial}$

To avoid propagations of errors when computing the Reactive Power Requested, $Q_{initial}$ and $V_{startup}$ are also initialized everyday at 00:00 for Technical Units whose Active Power injection or offtake is above the Minimum Active Power Threshold at this time, using respectively the Reactive Power and the Grid Voltage measured at during the first quarter-hour of each day.

Setpoint request – Manual Control Service Type

For the quarter-hour following(s) during which Technical Unit is expected to ramp-up its production of Reactive Power for the Manual Control Service Type (as per requirements in Art. II.5) Q_{req} will correspond to the entire volume requested for this quarter-hour.

Case 1

For a Setpoint request that arrives at the latest 10 minutes after the beginning of a given quarter-hour (at a $T_{request}$ equal to or smaller than start of the quarter-hour + $10 \cdot 60 = 600$ sec within the quarter-hour at-), the Q_{req} for the quarter-hour during which the Setpoint is requested (Qh1 in the figure below) corresponds to

$$Q_{req} (Qh1) = Q_{req_manual}$$

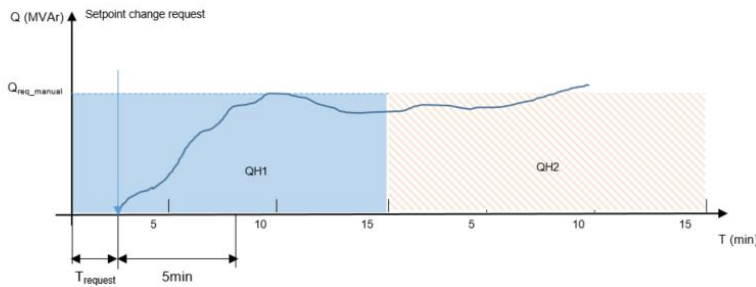


Figure 3: calculation of Q_{req} for a quarter hour during which a Setpoint request occurs before 10 minutes within the quarter-hour

Case 2

For a Setpoint request that arrives later than 10 minutes after the beginning of the quarter-hour (at a $T_{request}$ larger than start of the quarter-hour + $10 \cdot 60 = 600$ sec within the quarter-hour), the Q_{req} for the quarter-hour during which the Setpoint is requested (Qh1) and the quarter-hour following the quarter-hour during which the Setpoint has been requested (Qh2) corresponds to

$$Q_{req} (Qh1) = Q_{req} (Qh2) = Q_{req_manual}$$

Annex 2 Calculation of remuneration of the Service

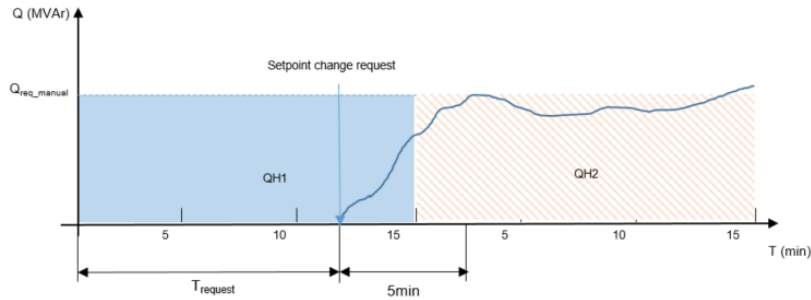


Figure 4: calculation of Q_{req} for 2 quarter hours during which a Setpoint request occurs after 10 minutes within the first quarter-hour

- ~~Remuneration principle for a Controlling Technical Unit started up for the last time (meaning the last moment in time where the Technical Unit's active power injection value exceeded its Minimum Active Power Threshold value as agreed in Annex 1) or after a manual Setpoint is reached.~~
- ~~U_{norm_exp} : the standard operational Grid Voltage under which the Technical Unit is foreseen to operate, as agreed in the Technical Unit's Connection Contract;~~
- ~~P_{tech_max} : a data that indicates the installed capacity (in MW) of a Technical Unit in line with articles 45 and 48 of the SOGL, as mentioned in the CIPU Contract;~~

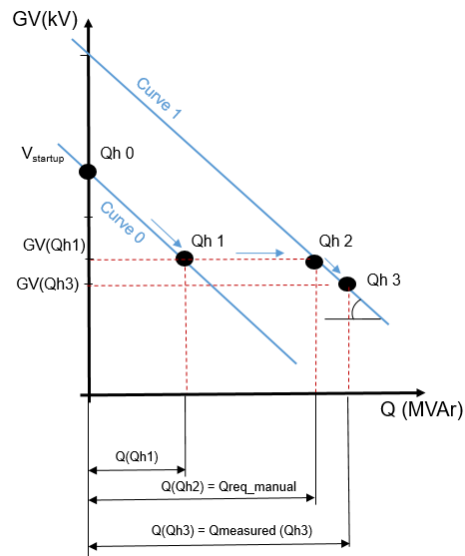
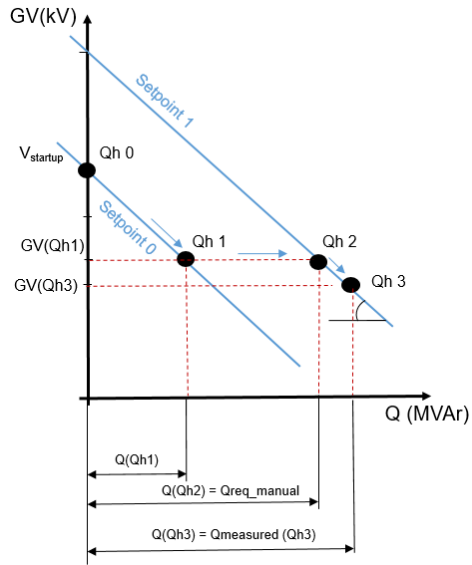
The following example describes the principle for the remuneration:

For a Controlling Technical Unit for 4 consecutive quarter-hours, remuneration for each quarter-hour would be as follows:

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Annex 2 Calculation of remuneration of the Service



- Qh 0 : The Technical Unit starts injecting Active Power above its Minimum Active Power Threshold (as per Annex 1). Average Grid Voltage over Qh 0 is V_{startup} and Q_{initial} is assumed to be 0 MVar.



Annex 2 Calculation of remuneration of the Service

- o **Qh 1** : While ~~still at Setpoint~~ delivering the Automatic Control Service according to curve 0, the Grid Voltage evolves to GV(Qh1). ~~Q_{req-rem}~~ (Qh1) is calculated according to the α_{eq} , GV and $V_{startup}$ (using equation (1)) and is remunerated according to agreed price (as per Annex 12). $Q_{initial} = 0$ since no Setpoint-change request from Elia was received during this quarter-hour.
- o **Qh 2**: During Qh2 the ~~unit~~ Technical Unit has received a request for Setpoint change and has ~~moved its droop curve to~~ reached this Setpoint 1. ~~The Setpoint Revolt is reached during the Qh2-QH2~~ according to modalities described in Annex 8. ~~Q_{req-rem}~~ (Qh2) is equal to Q_{req_manual} as per equation (2). The Technical Unit restarts the Automatic Control following the curve 1.
- o **Qh 3**: ~~During Qh3, the unit has moved its droop curve to Setpoint 1.~~ To avoid the propagation of the error following a ~~setpoint~~ Setpoint request, ~~Q_{req-rem}~~ (Qh3) is calibrated using the measured Reactive Power and ~~voltage~~ Grid Voltage of this quarter-hour i.e. $Q_{initial} = Q_{measured}(Qh3)$ and $V_{startup} = GV(Qh3)$.

$$Q_{req_rem}(Qh3) = - \frac{(GV(Qh3) - V_{startup}) * \alpha_{eq} * 0,45 * P_{tech_max}}{U_{norm_exp}} + Q_{initial} = Q_{measured}(Qh3)$$

For the quarter hour following Qh3, in the case of no new ~~setpoints~~ Setpoints sent, the ~~Q_{req-rem}~~ is going to be calculated according to the α_{eq} , GV, new $V_{startup}$ and $Q_{initial}$ (using equation (1)) as defined above and is remunerated according to agreed price (as per Annex 12)

~~For the quarter-hour(s) during which Technical Unit is expected to ramp-up its production of Reactive Power for the Manual Control Service Type (as per requirements in Art. II.5) Q_{req-rem} will correspond to the entire volume requested for this quarter-hour.~~

Example 1

~~For a Setpoint change request that arrives at the latest 10 minutes after the beginning of a given quarter-hour (at a $T_{request}$ equal to or smaller than start of the quarter-hour + $10*60=600sec$ within the quarter-hour), the ~~Q_{req-rem}~~ for the quarter-hour during which the Setpoint change is requested (Qh1 in the figure below) corresponds to~~

$$Q_{req_rem}(t)$$

2.A.1 Example of calculation of the Reactive Power Requested for a Controlling Technical Unit

The table below shows an example of the computation of the Reactive Power Requested (Q_{req}) for a Controlling Technical Unit assuming that:

- The Technical Unit started with an initial Reactive Power ($Q_{initial}$) of 0 MVar and an initial Grid Voltage ($V_{startup}$) of 410.401 kV at the Service Measurement Point
- The Sensitivity Coefficient is equal to: $\frac{\alpha_{eq} * 0,45 * P_{tech_max}}{U_{norm_exp}} = 27,33$

Date	Injection (MW)	Grid Voltage GV (kV)	$Q_{initial}$ (MVar)	$V_{startup}$ (kV)	Reactive Power measured (MVar)	Setpoint (MVar)	$\Delta V = \text{Grid Voltage} - V_{startup}$ (kV)	Q_{req} (MVar) = $-\Delta V * 27,33 + Q_{initial}$
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Annex 2 Calculation of remuneration of the Service

10:15:00	150	409,652	0	410,401	21	/	-0,749	20,47017
10:30:00	150	409,595	0	410,401	23	/	-0,806	22,02798
10:45:00	150	409,631	0	410,401	22	/	-0,77	21,0441
11:00:00	150	409,623	0	410,401	22	/	-0,778	21,26274
11:15:00	150	409,596	0	410,401	22	/	-0,805	22,00065
11:30:00	150	409,685	0	410,401	20	/	-0,716	19,56828
11:45:00	150	409,627	0	410,401	20	/	-0,774	21,15342
12:00:00	150	410,064	0	410,401	-80	-75	-0,337	-75
12:15:00	150	410,835	-70	410,835	-70	/	0	-70
12:30:00	150	410,688	-70	410,835	-66	/	-0,147	-65,98249

- From 10:15 to 11:45 included, the Reactive Power Requested is computed according to the formula (1) described in this annex and using the $Q_{initial}$, $V_{startup}$ and Sensitivity Coefficient as defined above.
- At 12:00, a Setpoint of 75 MVar (absorption) is requested by Elia. The Reactive Power Requested for this quarter-hour is then -75 MVar.
- At 12:15, a calibration is made using the measured Grid Voltage and measured Reactive Power. $Q_{initial}$ is equal to the measured Reactive Power for this quarter-hour and $V_{startup}$ is equal to the measured Grid Voltage for this quarter-hour. By application of formula (1), the Reactive Power Requested for this quarter-hour is equal to the measured Reactive Power.
- As of 12:30, the Reactive Power Requested is again computed based on formula (1) using the calibrated values of $Q_{initial}$ and $V_{startup}$

2.A.2 Example of calculation of the Reactive Power Requested for a Non-controlling Technical Unit

The table below shows an example of the computation of the Reactive Power Requested (Q_{req}) for a Non-Controlling Technical Unit. The Reactive Power Requested is equal to the last Setpoint value communicated by Elia as described in Annex 8.

Date	Injection (MW)	Setpoint (MVar)	Q_{req} (MVar) = Setpoint
10:15:00	150	0	0



Annex 2 Calculation of remuneration of the Service

10:30:00	150	20	20
10:45:00	150	20	20
11:00:00	150	20	20
11:15:00	150	40	40
11:30:00	150	40	40

Annex 2 Calculation of remuneration of the Service

2.B DETERMINATION OF THE Price(Qh_n)

Depending on the Q_{req} as computed in this annex, the price used for the remuneration is determined based on the price structure as per Annex 12.

For a Controlling Technical Unit In Injection Mode:

- If $0 < Q_{req} < Q1$: price 1 is used for the remuneration
- If $Q1 \leq Q_{req} \leq Q_{tech_max}$: price 1 is used for the remuneration of the Reactive Power volume till Q1 and price 2 is used for the remuneration of the Reactive Power volume from Q1 to Q_{req}
- If $Q3 < Q_{req} < 0$: price 3 is used for the remuneration
- If $Q_{tech_min} \leq Q_{req} \leq Q3$: price 3 is used for the remuneration of the Reactive Power volume till Q3 and price 4 is used for the remuneration of the Reactive Power volume from Q3 to Q_{req}

For a Controlling Technical Unit in Compensator Mode:

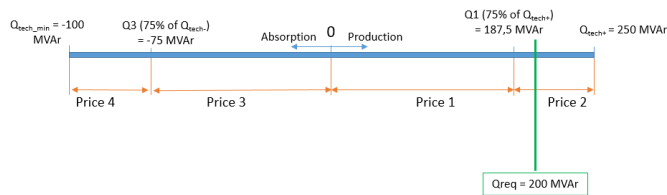
- If $0 < Q_{req} < Q1$: price 5 is used for the remuneration
- If $Q1 \leq Q_{req} \leq Q_{tech_max}$: price 5 is used for the remuneration of the Reactive Power volume till Q1 and price 6 is used for the remuneration of the Reactive Power volume from Q1 to Q_{req}
- If $Q3 < Q_{req} < 0$: price 7 is used for the remuneration
- If $Q_{tech_min} \leq Q_{req} \leq Q3$: price 7 is used for the remuneration of the Reactive Power volume till Q3 and price 8 is used for the remuneration of the Reactive Power volume from Q3 to Q_{req}

For a Non-Controlling Technical Unit :

- If $0 < Q_{req} < Q_{tech_max}$: price 9 is used for the remuneration
- If $Q_{tech_min} \leq Q_{req} < 0$: price 10 is used for the remuneration

Example for a Controlling Technical Unit in Injection Mode

Assuming the Technical Control Band and price band are defined in the following figure and the Q_{req} is equal to 200 MVAR:



The remuneration is:

$$Remuneration(Qh_n) = 187.5 * \frac{1}{4} * Price 1 + (200 - 187.5) * \frac{1}{4} * Price 2$$

Annex 2 Calculation of remuneration of the Service

$$Q_{h1} = Q_{req_manual}$$

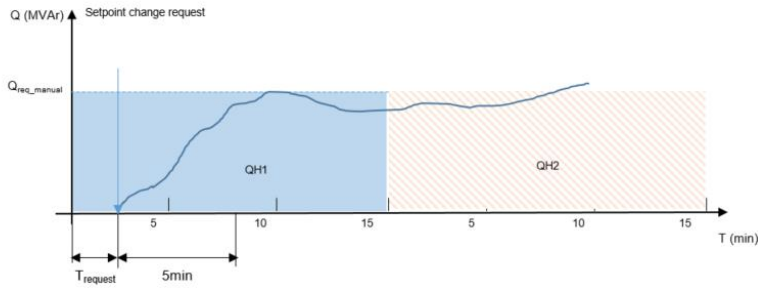


Figure 2: Example of the calculation of Q_{req_rem} for a quarter-hour during which a Setpoint change request occurs before 10 minutes within the quarter-hour

Example 2

For a Setpoint change that arrives later than 10 minutes after the beginning of the quarter-hour (at a $T_{request}$ larger than start of the quarter-hour + $10 \cdot 60 = 600$ sec within the quarter-hour), the Q_{req_rem} for the quarter-hour during which the Setpoint change is requested (QH1) and the quarter-hour following the quarter-hour during which the Setpoint change has been requested (QH2) corresponds to

$$Q_{req_rem}(Qh1) = Q_{req_rem}(Qh2) = Q_{req_manual}$$

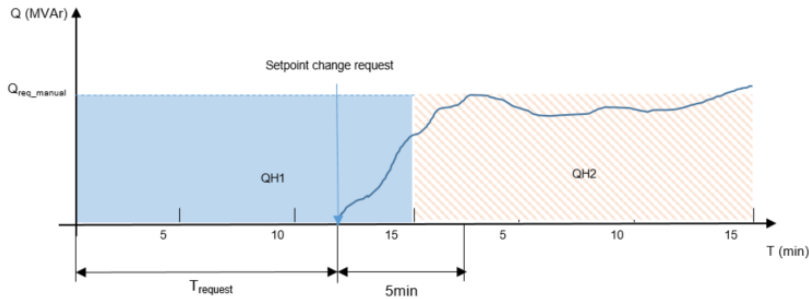


Figure 3: Example of the calculation of Q_{req_rem} for 2 quarter hours during which a Setpoint change request occurs after 10 minutes within the first quarter-hour



ANNEX 3. DELIVERY CONTROL OF THE AUTOMATIC CONTROL SERVICE TYPE

Elia expects that the VSP's Reactive Power ~~injection~~ production or absorption, at the Service Measurement Point as defined in Annex 13, remains within the calculated tolerance band around the value of $Q_{req_control}$ as defined in the formula below. If this is not the case, Elia will apply penalties as per Art. II.9

$$Q_{req} = - \frac{\alpha_{eq} * (GV(t) - V_{startup}) * 0,45 * P_{tech,max}}{U_{norm_expl}} + Q_{initial}$$

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Elia tolerates a deviation in the delivery of the Service for each quarter-hour. This tolerance is calculated as follows:

$$Tolerance = 7.5\% * Q_{tech,max}$$

With a:

- minimum value of 1 MVAR
- maximum value of 25 MVAR

This error margin is considered equally on the upper or lower margins of the additional Reactive Power value that should have been supplied by the Technical Unit. Two values are defined around Q_{req} :

- Limit inf. = $Q_{req} - Tolerance$
- Limit sup = $Q_{req} + Tolerance$

The delivery control consists in checking if the Reactive Power supplied at the Service Measurement Point is within the tolerance band defined by Limit inf. and Limit sup.

Example of activation control for a certain Technical Unit

Considering a unit with the following characteristics:

- o it is connected to the 150kV network (U_{norm_expl});
- o it can supply a volume of Reactive Power in the band [$Q_{tech_min} = -48$; $Q_{tech_max} = 96,77$] MVAR;
- o it has a maximum technical power (P_{max_tech}) of 150 MW and minimum Active Power (P_{min}) of 100 MW;
- o it has a Sensitivity Coefficient α_{eq} of 18
- o the standard operational Grid Voltage under which the Technical Unit is foreseen to operate (U_{norm_expl}) is 150 kV
- o the average Grid Voltage value of the quarter hour during which the unit started up for the last time $V_{startup} = 158.8$ kV



Annex 3 Delivery control of the Automatic Control Service Type

For this example, the 15-minute measurements of the Grid Voltage (GV(t)) and metering data of the Reactive Power (Q_{meas}) for 3 september 2019 are checked from ~~1:45pm~~13:45 to ~~6:30pm~~18:30.

In this case, $Q_{req_control}$ is then calculated as follows (according to using the formula defined in Annex 5):above.

$$Q_{req_control} = - \frac{\alpha_{eq} * (GV(t) - V_{startup}) * 0,15 * P_{max_tech}}{U_{norm_exp1}} + Q_{initial}$$



Annex 3 Delivery control of the Automatic Control Service Type

Where $Q_{initial} = 0$ in this example as it is assumed no new setpoint has been sent by Elia.

The margin of tolerance defined in the present Annex corresponds to $0,075 * 96,777 = 7,25$ MVar and it is distributed around Q_{req} defining:

- Limit inf. = $Q_{req_control} = Q_{req} - 7.25$ MVar
- Limit sup = $Q_{req_control} + Q_{req} + 7.25$ MVar

The delivery control consists of checking if Q_{meas} is within the tolerance band defined by Limit inf. and Limit sup.

Date	Hour	P [MW]	P _{min} [MW]	GV = U _{meas} [kV]	Q _{meas} [MVar]	Q _{req_control} [MVar]	Limit inf. [MVar]	Limit sup. [MVar]	Succeeded?
03/09/2019	13:45	150	100	158,4	14,36	3,37	- 3.88	10,62	N
03/09/2019	14:00	150	100	158,1	12,56	5,42	-1,83	12,67	Y
03/09/2019	14:15	150	100	158,3	10,63	3,87	-3,38	11,12	Y
03/09/2019	14:30	150	100	158,3	11,2	4,35	-2,9	11,6	Y
03/09/2019	14:45	150	100	158,5	13,06	2,43	-4,82	9,68	N
03/09/2019	15:00	150	100	158,3	14,99	3,76	-3,49	11,01	N
03/09/2019	15:15	150	100	158,3	15,53	4,01	-3,24	11,26	N
03/09/2019	15:30	150	100	158,5	14,26	2,76	-4,49	10,01	N
03/09/2019	15:45	150	100	158,5	8,73	2,26	-4,99	9,51	Y
03/09/2019	16:00	150	100	158,7	7,83	0,95	-6,3	8,2	Y
03/09/2019	16:15	150	100	158,2	8,76	5,05	-2,2	12,3	Y
03/09/2019	16:30	150	100	158,1	9,03	5,72	-1,53	12,97	Y
03/09/2019	16:45	150	100	158,1	14,21	5,53	-1,72	12,78	N
03/09/2019	17:00	150	100	158,3	15,26	4,48	-2,77	11,73	N
03/09/2019	17:15	150	100	158,1	11,69	5,43	-1,82	12,68	Y
03/09/2019	17:30	150	100	158	11,3	6,73	-0,52	13,98	Y
03/09/2019	17:45	150	100	157,8	13,39	8,38	1,13	15,63	Y
03/09/2019	18:00	150	100	157,7	16	9,17	1,92	16,42	Y
03/09/2019	18:15	150	100	157,6	16,8	9,94	2,69	17,19	Y
03/09/2019	18:30	150	100	156,8	24,9	16,72	9,47	23,97	N

For the sake of clarity, the values illustrated in the table above are represented :

- in blue for the measured/metered values
- in green for the computed values
- in black for the fixed values

Elia deems that the Service has not been supplied for any quarter-hour during which the metered Reactive Power Q_{meas} is not within calculated lower and upper limits (Limit inf and Limit sup). These quarter-hours are considered as failed samples.

In this example, this is the case for 8 out of 20 quarter hours, i.e. 40% of the time.

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Annex 3 Delivery control of the Automatic Control Service Type

This sample is representative of one of the 6 samples that are considered per ~~unit~~ Technical Unit per month. Based on the six samples of one month, Elia ~~can apply~~ applies a remuneration reduction as described in Annex 6.

In order to avoid a double penalization related to the tariff for the offtake or injection of additional reactive energy and the delivery control of the Automatic Control Service Type, quarter-hours for which a Reactive Power volume has already been penalized through the tariff for the offtake or injection of additional reactive energy will not be considered in the delivery control of the Service.



ANNEX 4. DELIVERY CONTROL OF THE MANUAL CONTROL SERVICE TYPE

Following the request of a Setpoint ~~change~~, Elia expects that the VSP adapts his Reactive Power ~~injection~~ production or absorption to reach the value of Q_{req} within the requested timeframe to respond to Elia's request. ~~as defined in Art. II.5.4.~~

$$Q_{req} = Q_{req_manual}$$

With Q_{req_manual} being the last Setpoint value communicated by Elia as described in Annex 8.

Elia tolerates a deviation in the delivery of the Service for each quarter-hour. This tolerance is calculated as follows:

$$Tolerance = 7.5\% * Q_{tech,max}$$

With a :

- minimum value of 1 MVAR
- maximum value of 25 MVAR

This error margin is considered equally on the upper or lower margins of the additional Reactive Power value that should have been supplied by the Technical Unit. ~~Two values are defined around Q_{req} :~~

- Limit inf. = $Q_{req} - Tolerance$
- Limit sup = $Q_{req} + Tolerance$

The delivery control of the Manual Control Service Type consists in checking whether the Reactive Power supplied at the Service Measurement Point is within the tolerance band defined by Limit inf. and Limit sup. for at least two successive 30" Reactive Power measurements within the requested timeframe as defined in art. II.5.4.

Example of verification for a certain Technical Unit:

Elia sends an activation request at 8 a.m. (~~generation~~ production of Reactive Power) to Technical Unit X with the Setpoint "150 MVAR" (the procedures for the communication of a Setpoint are described in Annex 8). In this case $Q_{req_control} = 150MVAR$

To verify whether the ~~required~~ Reactive Power Requested was supplied ($Q_{req_control}$), Elia uses the remote 30" Reactive Power measurements available for the 5 minutes following the activation request, i.e.:

Time	$Q_{meas}(MVAR)$	▲
8:00:00	81.76	
8:00:30	75.84	
8:01:00	77.42	
8:01:30	82.55	
8:02:00	61.22	
8:02:30	59.25	
8:03:00	78.21	
8:03:30	141.41	
8:04:00	152.86	
8:04:30	146.15	
8:05:00	145.36	

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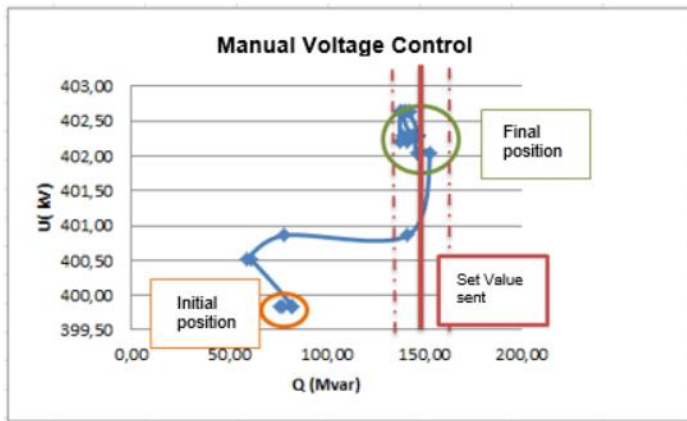
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Annex 4 Delivery control of the Manual Control Service Type

Elia checks whether the volume of the $Q_{req_control}$ (150 MVAR) and measured at the Service Measurement Point is within the limits of the tolerance calculated in the present Annex, for at least two successive measurements. Considering a Technical Unit with $Q_{tech,max} = 200$ MVAR, the Tolerance equals to 15 MVAR.

That is the case in this example as of the measurement at 8:03:30 (i.e. 3 minutes and 30 seconds after 8 a.m.). The VSP has responded correctly to Elia's activation request (see also graphic example hereunder). Indeed the ~~reactive power~~ Reactive Power measured is within the tolerance for a least two successive measurements (8:03:30 and 8:04:00).

In order to avoid a double penalization related to the tariff for the offtake or injection of additional reactive energy and the delivery control of the Manual Control Service Type, quarter-hours for which a Reactive Power volume has already been penalized through the tariff for the offtake or injection of additional reactive energy will not be considered in the delivery control of the Service.





(alphaEQ)

ANNEX 5. EXAMPLE OF CALCULATION OF RELATIVE SENSITIVITY COEFFICIENT OF TECHNICAL UNITS (ALPHA_{EQ})

Disclaimer: In the present Annex is presented an example of the calculation of the relative Sensitivity Coefficient (α_{eq}) value for informative reasons. It is to be noted that this value is a structural information for the Technical Unit's capability to regulate voltage and ~~reactive power~~ **Reactive Power** and its provision is foreseen by the Federal Grid Code. In case a Technical Unit provides the Automatic Control Service Type, the relative Sensitivity Coefficient is determined by Elia after discussions between Elia and the Elia Grid User. For each Technical Unit delivering the Automatic Control Service Type this value is annotated in Annex 1.

The reaction of a certain Technical Unit to voltage changes at its Service Measurement Point corresponds to the following equation (which is also a characteristic of the Technical Unit's droop curve):

$$\alpha_{eq} = - \frac{\frac{\Delta Q}{0,45xP_{nom}}}{\frac{\Delta GV}{U_{norm_expl}}}$$

- ΔGV : the difference between the Grid Voltage before and after the network voltage variation;
- ΔQ : the absolute difference between the Reactive Power measured at Q_{h_n} and the Reactive Power Measured at $Q_{h_{(n-1)}}$. This volume corresponds to the additional Reactive Power that must be supplied by a Technical Unit during the 15-minute interval considered after a variation of the measured voltage (ΔGV) on this same 15-minute interval, calculated by applying the formula above.
- U_{norm_expl} : The standard operational Grid Voltage under which the Technical Unit is foreseen to operate, as agreed in the Technical Unit's Connection Contract.
- Q_{h_n} : the considered quarter-hour

Elia has 15-minute metering data and measurements of the Reactive Power and measurements of the voltage at the Service Measurement Point of the Technical Unit. The quarter-hourly metering, following a request for Setpoint ~~change~~ from Elia, are not considered in a valid sample.

A time interval is chosen for which the measurement of the Grid Voltage and of the net Active and Reactive Power of the Technical Unit concerned is available, but not necessarily on the site of the Technical Unit. The choice of time interval must meet the following criteria:

- There are no radical variations in the frequency of the system and the net Active Power of the Technical Unit during the time interval, and the Setpoint is not changed.
- No radical variations of the Grid Voltage and the net ~~injection~~ **production** or absorption of Reactive Power of the Technical Unit occur during the first 20 seconds and last 20 seconds of the interval.
- There is no major variation in Grid Voltage and thus in the net ~~injection~~ **production** or absorption of Reactive Power of the Technical Unit during the rest of the interval.



(alphaEQ)

Calculation of ΔQ and ΔGV

ΔGV is calculated by the following formula:

$$\Delta GV = GV_2 - GV_1$$

Where:

- GV_1 : average Grid Voltage during the first 20 seconds of the interval
- GV_2 : average Grid Voltage during the last 20 seconds of the interval

ΔQ is calculated by the following formula:

$$\Delta Q = Q_2 - Q_1$$

Where:

- Q_1 : average Reactive Power ~~injection~~production or absorption of the Technical Unit during the first 20 seconds of the interval
- Q_2 : average Reactive Power ~~injection~~production or absorption of the Technical Unit during the last 20 seconds of the interval



Annex 6 Penalty for non-delivery of the Automatic Control Service Type

ANNEX 6. PENALTY FOR NON-DELIVERY OF THE AUTOMATIC CONTROL SERVICE TYPE

Elia shall deem the Automatic Control Service Type to have not been supplied for a given 15-minute interval when the variation in Reactive Power measured for a certain Service Measurement Point does not fall within the margin of error defined in Annex 3.

If the conditions for the supply of the Automatic Control Service Type are not satisfied, Elia will calculate reductions to be applied to each monthly remuneration based on the following rule:

$$\%Q_{\text{failed}} = \frac{\# \text{ QHs not compliant with the supply conditions in the monthly samples}}{\# \text{ QHs analysed in the monthly samples}}$$

- Where $\%Q_{\text{failed}}$ is between 0 and 30%,% included, Elia shall not apply the remuneration reduction.
- Where $\%Q_{\text{failed}}$ is between 3031% and 80%,% included, a 25% reduction shall be applied to the remuneration for the Service for this Technical Unit as set in Art.II.8.3, for the entire month as of which the sample was constituted.
- Where the $\%Q_{\text{failed}}$ is between 8081% and 100%, Elia shall deem that the Service has not been supplied and shall therefore not remunerate the VSP for the Technical Unit concerned, for the entire month as of which the sample was constituted.



Annex 7 Penalty for non-delivery of the Manual Control Service Type

ANNEX 7. PENALTY FOR NON-DELIVERY OF THE MANUAL CONTROL SERVICE TYPE

When the VSP fails to activate the Service (as established from the delivery control procedure described in Annex 4), Elia will apply a reduction of the monthly remuneration.

The penalty shall be proportional to the missing volume ($Q_{\text{manual_missing}}$) i.e. the Reactive Power volume that has not been provided during the activation of Manual Control Service Type according to the following formula:

$$\begin{aligned} \text{Remuneration reduction} &= Q_{\text{manual_missing}} * \text{price of the last MVar supplied requested} * 1,5 \\ &* 10 \text{h Average Setpoint duration} \end{aligned}$$

Where:

- the Average Setpoint duration is set to 10 hours
- The price of the last MVar of the Setpoint requested by Elia is based on the price structure as defined in Annex 12

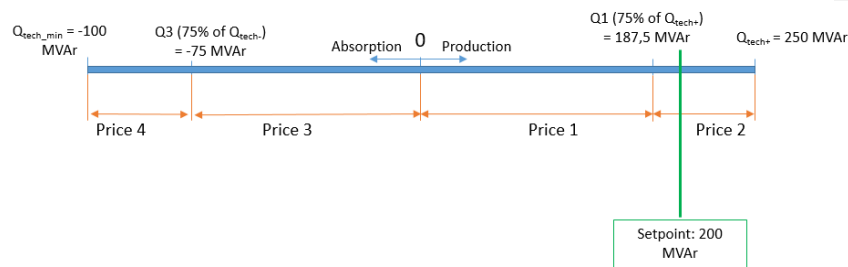
Example:

For instance, if the Setpoint requested by Elia for the example used in Annex 4 had been 200 MVar, Elia would have noted in its measurements that the maximum value attained by the ~~unit~~ Technical Unit is 152,86 MVar.

A penalty for the volume not supplied would then be imposed on the delta, i.e.

$$Q_{\text{manual_missing}} = 200 - 152,86 = 47,14 \text{ MVar}$$

Assuming that the Technical Control Band and the corresponding price band of the Technical Unit are represented on the figure below, the price of the last MVar requested will correspond to the Price 2.



The remuneration reduction will be:

$$\text{Remuneration reduction} = 47,14 * \text{Price 2} * 1,5 * 10$$

If the VSP fails to confirm reception of the activation message, $Q_{\text{manual_missing}}$ is considered to be equal to the entire value of the Setpoint ~~change~~-request (i.e. in the above example, $Q_{\text{manual_missing}}=200\text{MVar}$).

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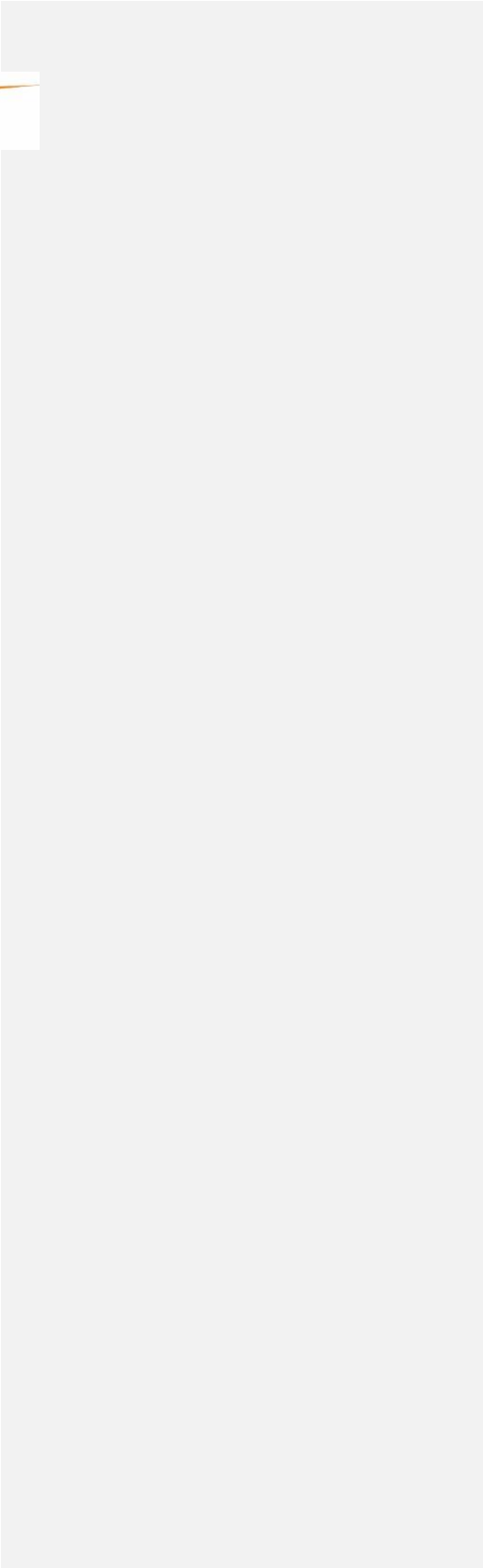
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Signature [VSP]:



Annex 7 Penalty for non-delivery of the Manual Control Service Type

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Annex 8 Communication of a Setpoint by Elia for Manual Control Service

ANNEX 8. COMMUNICATION OF A SETPOINT BY ELIA FOR MANUAL CONTROL SERVICE

When receiving a Setpoint request from Elia pursuant to Art. II.5.4 and II.5.5, the VSP of a Technical Unit needs to follow a procedure to correctly perform the Manual Control Service. The procedure is described in this annex for both Controlling and Non-Controlling Technical Units.

8.A CONTROLLING TECHNICAL UNIT

When receiving a Setpoint, the VSP of a Controlling Technical Unit needs to follow three steps:

1) Receiving the Setpoint

When Elia identifies a need of Reactive Power to be produced or absorbed by a Technical Unit, Elia sends a Setpoint to the VSP of this Technical Unit that corresponds to the new value of the Reactive Power that has to be produced or absorbed by the Technical Unit (Q_{req_manual}) at the Service Measurement Point. The VSP needs to be able to receive and integrate this Setpoint according to the modalities defined in Art II.5.4 and II.5.5.

2) Reaching the Setpoint

Within the timeframe indicated in Art. II.5.4II.5.4 after the Setpoint request, the VSP of the Technical Unit has to stop its Automatic Control, reach the requested Setpoint and maintain the Reactive Power in the tolerance band in accordance with modalities described in Annex 4.

3) Restarting the Automatic Control

When the Setpoint request is supposed to be correctly executed in accordance with modalities described in Annex 4, the Automatic Control has to be restarted.

An example of ~~delivery of the Service can be~~ the communication of a Setpoint by Elia to a VSP is shown on the figure hereunder. ~~The Y axis corresponds to the Grid Voltage measurement at the Service Measurement Point of the Technical Unit and the X axis defines the volume of Reactive Power produced/absorbed by that Technical Unit on the Service Measurement Point.~~ This example describes the three steps of the communication of a Setpoint for a Controlling Technical Unit

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Annex 8 Communication of a Setpoint by Elia for Manual Control Service

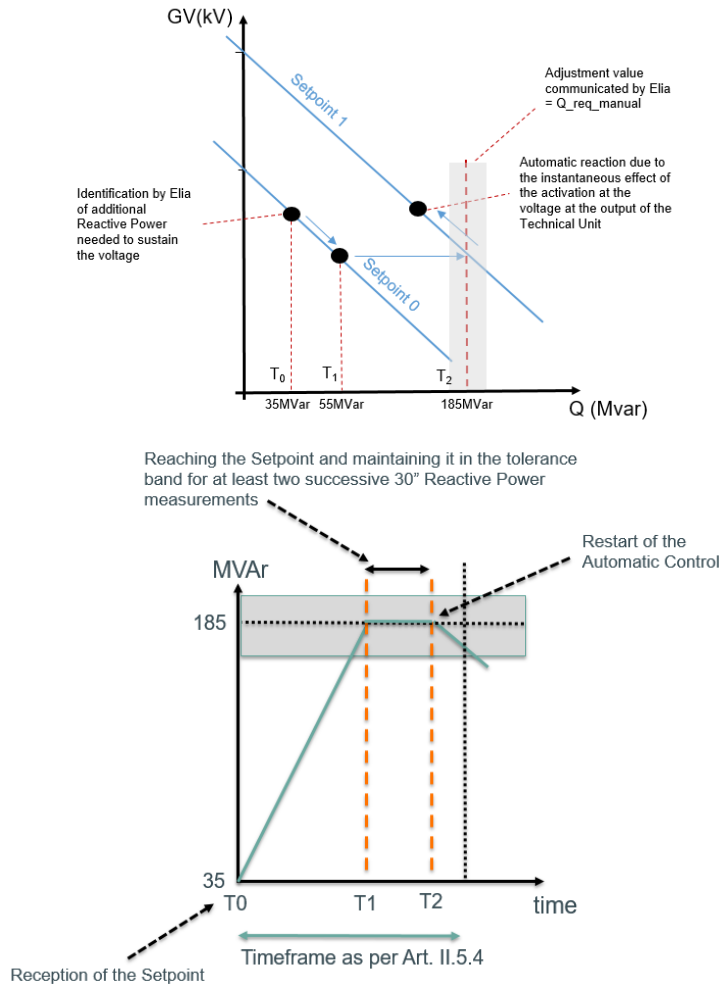


Figure 5: Example of a ~~setpoint change~~ Setpoint request by Elia for a Controlling Technical Unit

When Reception of the Setpoint

At T₀, Elia identifies a need for additional Reactive Power to be generated (T₀), produced by the Controlling Technical Unit generates 35 MVar by adapting the setting of its automatic voltage regulator. Elia wishes to generate an additional volume of 150 MVar, and thus sends the new Setpoint "185 MVar" (150 + 35) to the VSP, as per Article II.5.4.

This Reaching the Setpoint

Within the timeframe indicated in Art. II.5.4II.5.4 after the Setpoint request, the VSP needs to stop its Automatic Control, reach the requested Setpoint (185 MVar) and maintain the

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Annex 8 Communication of a Setpoint by Elia for Manual Control Service

Reactive Power in the tolerance band (grey band on Figure 5) in accordance with modalities described in Annex 4. Figure 5 shows that the requested Setpoint is reached at T1 and the Reactive Power is then correctly maintained in the tolerance band until T2.

Restart of the Automatic Control

At T2, the Setpoint request is correctly executed and the Automatic Control has to be restarted from that point.

8.B NON-CONTROLLING TECHNICAL UNIT

When receiving a Setpoint, the VSP of a Non-controlling Technical Unit needs to follow three steps:

1) Receiving the Setpoint

When Elia identifies a need of Reactive Power to be produced or absorbed by a Technical Unit, Elia sends a Setpoint to the VSP of this Technical Unit that corresponds to the new value of the Reactive Power measured that has to be produced or absorbed by the Technical Unit (Q_{req_manual}) at the Service Measurement Point. The grey area around the Setpoint desired by Elia corresponds to the margin VSP needs to be able to receive and integrate this Setpoint according to the modalities defined in Annex 4 Art II.5.4 and II.5.5.

The VSP has 5 minutes to carry out this change. In this example, the VSP addressed Elia's request at T1 (55 MVar).

From the moment it reaches the desired volume (T2 in the graph), the VSP considers that Elia's activation request was met and leaves the automatic control to run from that point on, until a new Setpoint is communicated by Elia (Setpoint 1 on the graph).

2) Reaching the Setpoint

Within the timeframe indicated in Art. II.5.4II.5.4 after the Setpoint request, the VSP of the Technical Unit has to reach the requested Setpoint and maintain the Reactive Power in the tolerance band in accordance with modalities described in Annex 4.

3) Maintaining the Setpoint

The Setpoint has to be maintained in the tolerance band by the VSP until a new Setpoint is requested by Elia or the Active Power of the Technical Unit becomes lower than its Minimum Active Power Threshold.

An example of the communication of a Setpoint by Elia to a VSP is shown on the figure hereunder. This example describes the three steps of the communication of a Setpoint for a Non-controlling Technical Unit.

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Annex 8 Communication of a Setpoint by Elia for Manual Control Service

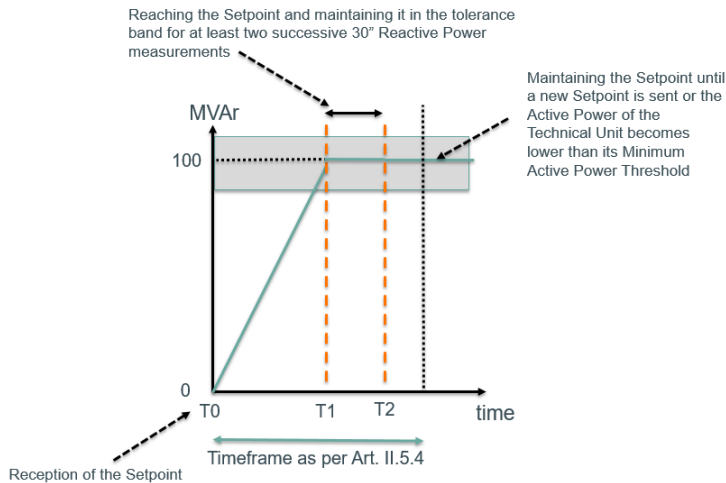


Figure 6: Example of a Setpoint request by Elia for a Non Controlling Technical Unit

Reception of the Setpoint

At T0, Elia identifies a need for additional Reactive Power to be produced by the Non-controlling Technical Unit and sends the Setpoint "100 MVar" to the VSP as per Article II.5.4.

Reaching the Setpoint

Within the timeframe indicated in Art. II.5.4 after the Setpoint request, the VSP needs to reach the requested Setpoint (100 MVar) and maintain the Reactive Power in the tolerance band (grey band on Figure 6) in accordance with modalities described in Annex 4. Figure 6 Figure 6: Example of a Setpoint request by Elia for a Non Controlling Technical Units shows that the requested Setpoint is reached at T1 and the Reactive Power is then correctly maintained in the tolerance band until T2.

Maintaining the Setpoint

From T2, the Setpoint has to be maintained in the tolerance band by the VSP until a new Setpoint is requested by Elia or the Active Power of the Technical Unit becomes lower than its Minimum Active Power Threshold.



Annex 9 Appropriation structure

ANNEX 9. APPROPRIATION STRUCTURE

Ancillary service	Remuneration	Booking reference
Voltage regulation	Automatic Control Service Type delivery control	910339
	Manual Control Service Type delivery control	910360
	MVAr Prod-normal mode (0-Q1 band)	910329
	MVAr Prod-normal mode (Q1-Qtech_max band)	910330
	MVAr Abs-normal mode (0-Q3 band)	910331
	MVAr Abs-normal mode (Q3-Qtech_min band)	910332
	MVAr Prod-compensator mode (0-Q1 band)	910333
	MVAr Prod-compensator mode (Q1-Qtech_max band)	910334
	MVAr Abs-compensator mode (0-Q3 band)	910335
	MVAr Abs-compensator mode (Q3-Qtech_min band)	910336
	MVAr Prod- non-regulating unit (all band)	910337
	MVAr Abs- non-regulating unit (all band)	910338
	Voltage regulation start-up	905503

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Annex 10 Contact persons

ANNEX 10. CONTACT PERSONS

Contract monitoring
Invoicing and payments <u>Settlement</u> <u>Invoicing and payments</u>
Real-time operations National dispatching (Operations) Chaussée de Vilvoorde 126 B-1000 Brussels Tel.: +32 (0)2 382 2383 Fax: +32 (0)2 382 2139 Email: dispatching@elia.be Northern regional dispatching office (Noord) Southern regional dispatching office (Zuid)
Non-real-time operations National dispatching (Duty) Chaussée de Vilvoorde 126 B-1000 Brussels Tel.: +32 (0)2 382 2308 Fax: +32 (0)2 382 2139 Email: dispatching@elia.be

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Annex 11 Elia Grid User Declaration

ANNEX 11. ELIA GRID USER DECLARATION

Elia Transmission Belgium NV

To the attention of :

Keizerslaan 20

1000 Brussels

[Date DD/MM/YYYY]

Subject: Designation of a VSP by the Elia Grid User

	Elia Grid User	VSP
Name		
Address		

The Elia Grid User declares that:

- He designates [VSP] as VSP for the delivery period of [DD/MM/2022] to 31/12/2022 to VSP located at [ADDRESS].
- He is aware of the content of the concerned contract to be concluded by Elia and VSP.
- He will not take other commitments with respect to, nor be in charge of the above mentioned contract between Elia and VSP regarding the delivery of the Voltage and Reactive Power Control Service (hereinafter "the Service"), without prejudice to what is stated in the last paragraphs of this Declaration.

The Elia Grid User recognizes and agrees that the contract between Elia and VSP for the delivery of the Service is without prejudice to its rights and obligations regarding any other contract signed between Elia and the Elia Grid User or a third party related to the Technical Units, such as (but not limited to) a connection contract, access contract, **GIPUOPA contract**, **SA** contract or contract for restoration or balancing services.

The Technical Units covered by this agreement are the following:

Technical Unit	EAN

The Elia Grid User and the VSP recognize that Elia is not accountable for:

- A disagreement between the Elia Grid User and the VSP regarding the production of energy and the delivery of the service voltage and Reactive Power control.

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Annex 11 Elia Grid User Declaration

- o A disagreement between the Elia Grid User and the VSP related to penalties, as provided in the contract for the Service.
- o A disagreement between the Elia Grid User and the VSP in regards to tarification of Reactive Power related to provision of the Service.

The VSP declares that he will inform the Elia Grid User and the Access Contract Holder in case of any modification regarding the delivery of the Service.

The present agreement between the Elia Grid User and the VSP is terminated in case the Elia Grid User notifies the VSP and Elia either of the designation by him of a new third party as VSP for the above mentioned Technical Unit(s) for the remaining term of the delivering period and upon signature by this new third party of a contract regarding the delivery of the Service with Elia, or of his willingness to act as the VSP himself for the above mentioned Technical Unit(s) for the remaining term of the delivering period. In the latter case the Elia Grid User recognizes and agrees to take over the rights and obligations of the contract regarding the delivery of the Service from the VSP.

If the present agreement between the Elia Grid User and the VSP is terminated for any other reason, **including following a termination by the VSP of the contract with Elia in accordance to Art. I.10.1**, or if a certain Technical Unit is deleted from the above list, and if the Elia Grid User is obliged to provide the Service, the Elia Grid User **shall by default assume the role of VSP for the concerned** recognizes and agrees to take over the rights and obligations of the contract regarding the delivery of the Service from the VSP for the concerned Technical Unit(s) until he would appoint a new third party as VSP.

The Elia Grid User, represented by:

Name:

Function:

Date:

The VSP, represented by:

Name:

Function:

Date:

ANNEX 12. REMUNERATION FOR ACTIVATION

Annex 12.12.A PRICE STRUCTURE

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The price (expressed in €/MVAh) for the Service is set according to:

- o The Technical Control Band within which the Technical Unit is producing or absorbing MVARs at the specific moment of the activation;
- o The ~~Group in which~~ability of the Technical Unit ~~is included~~to operate in Injection Mode and/or in Compensator Mode;
- o Whether the ~~unit~~Technical Unit is ~~controlling~~Controlling or ~~non~~Non-controlling;

The Parties have identified the following options:

- a) Technical Units that can supply Reactive Power in Injection Mode when they:
 - o ~~generate~~inject Active Energy beyond a certain threshold during a certain 15-minute period ($\% P_{max_tech} \times 15$ minutes; specified for each Technical Unit in Annex 1); or
 - o perform offtakes of Active Energy for reasons other than the supply of Reactive Power (e.g. a hydraulic Technical Unit in pump mode for storage reasons)

~~These are hereinafter referred to as "Group 1" and are indicated in green in Figure 5: Group 1 and Group 2 Technical Units.~~

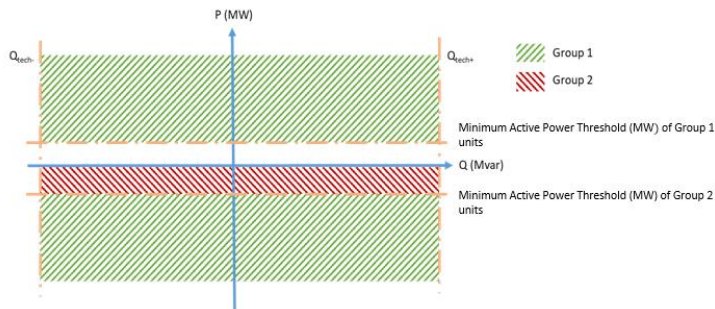


Figure 5: Group 1 and Group 2 Technical Units

Annex 12 Remuneration for Activation

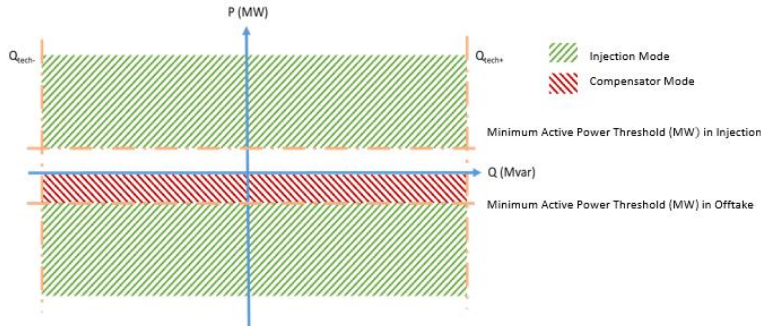


Figure 7: Technical Units in Injection Mode and Compensator Mode

- b) Technical Units that can supply Reactive Power in Compensator Mode and respond to a request from Elia to activate Reactive Power by offtaking a small quantity of Active Energy (specified for each Technical Unit capable of supplying this service in Annex 1);

~~These are hereinafter referred to as "Group 2" and are indicated in red in Figure 5: Group 1 and Group 2 Technical Units.~~

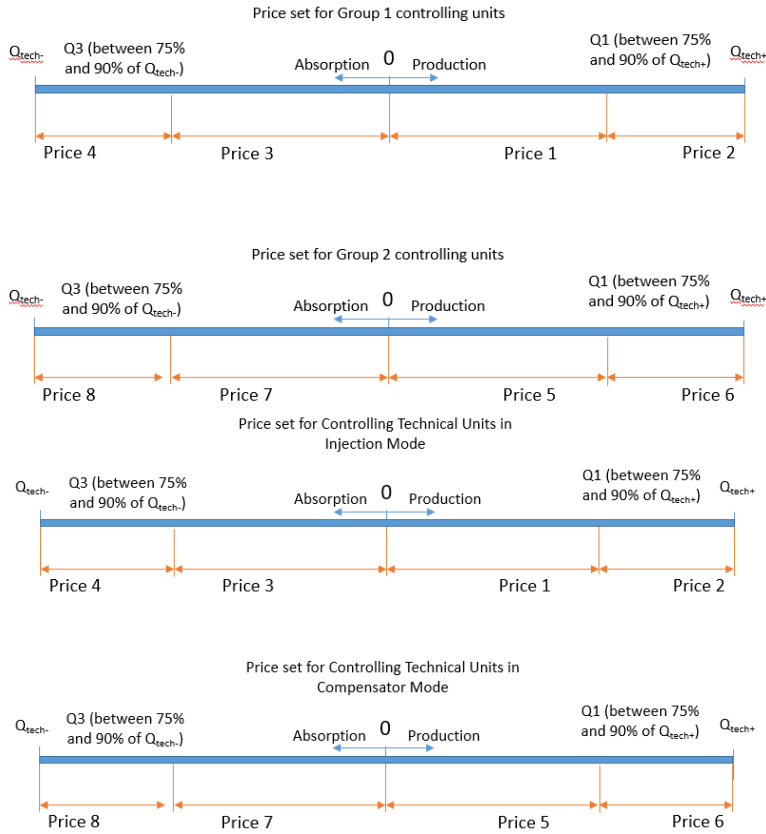
The VSP has the right to set different sets of prices according to the aforementioned criteria.

In particular:

- 1) For ~~controlling units~~ **Controlling Technical Units**, the VSP may set up to 2 prices for ~~injection production~~ or absorption. Technical Units that can provide the Service within ~~technical bands~~ **Technical Control Bands** equal to or larger than 20 MVar (whether in production or absorption) may split their Technical Control Band (in the side of ~~injection production~~ and/or absorption) in 2 price bands. The value of the ~~reactive power~~ **Reactive Power** defining the limit between the two price bands (referred as "Q1" and "Q3" in the following figure) can be chosen by the VSP between 75 % and 90% of $Q_{tech\ max}$ in production and between 75 % and 90% of $Q_{tech\ min}$ in absorption upon technical justification of the chosen limit. The VSP may propose different prices for ~~Group 1~~ **Injection Mode** and ~~Group 2 units~~ **Compensator Mode** as follows:

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Annex 12 Remuneration for Activation



Where:

- Q1 and Q3 are set for each Technical Unit in Annex 1;

For **Controlling** Technical Units that have Technical Control Bands lower than 20MVAR on the **injection/production** and/or absorption side, VSP's may propose 1 price per side:

- Price 1 (P1) for the **injection/production** side of **Group 1 controlling units/Controlling Technical Units in Injection Mode** ;
- Price 3 (P3) for the absorption side of **Group 1 controlling units/Controlling Technical Units in Injection Mode**;
- Price 5 (P5) for the **injection/production** side of **Group 2 controlling units/Controlling Technical Units in Compensator Mode**;



Annex 12 Remuneration for Activation

- Price 7 (P7) for the absorption side of ~~Group 2 controlling units; Controlling Technical Units in Compensator Mode;~~
- 2) For Non-Controlling Technical Units, the VSP may set one price for ~~injection production~~ (P9) and one for absorption (P10) of Reactive Power.

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Annex 12 Remuneration for Activation

12.B APPLICABLE PRICES

12.B.1 Controlling Technical Units

Technical Units	Price in Injection Mode (€/MVAh)				Price in Compensator Mode (€/MVAh)			
	Production		Absorption		Production		Absorption	
	P1	P2	P3	P4	P5	P6	P7	P8

12.B.2 Non controlling Technical Units

Technical Units	Price (€/MVAh)	
	Production	Absorption
	P9	P10

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ANNEX 13. PREQUALIFICATION PROCEDURE

The Prequalification Procedure 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.

In particular, the Prequalification Procedure will consist of the following steps:

a) Determination of available Technical Control Band

The VSP and Elia shall determine together based on technical documentation the Technical Control Band that the Technical Unit may put at Elia's disposal for the Service. This estimation is to be confirmed afterwards by the Prequalification Test.

b) Determination of local grid influence, Service Measurement Point and characteristics of the Service:

The VSP and Elia shall determine together the reference Service Measurement Point that will be used for the remuneration, Service steering and delivery control (among others for calculation of Q_{req_rem} , Q_{failed} and $Q_{manual_missing}$ as per Annex 2, Annex 6 and Annex 7 respectively). The VSP and Elia shall also determine together how local grid topology affects delivery of Reactive Power to the Service Measurement Point. They will assess together influence of cables, production units, loads and/or other grid elements such as batteries that may have such an influence. If, for any reason due to the local grid, the effect of both Automatic and Manual Control Service Types at the Service Measurement Point is not identifiable or effective, the Technical Unit may not provide the Service to Elia.

Automatic Control Service Type

As defined in II.3.3 a) and Annex 5, a Sensitivity Coefficient is determined by Elia in the contract following discussions between Elia and the VSP. This Sensitivity Coefficient defines the relation between the Grid Voltage and the Reactive Power produced or absorbed at the Service Measurement Point which is by default the Access Point or the Interconnection Point.

If, for any reason due to the local grid, this coefficient cannot be determined at the Access Point, Elia and the VSP will put everything in place to be able to find an alternative solution for the provision of the Service. Based on the discussions with the VSP, Elia may:

- either request to move the Service Measurement Point at a point located downstream the Access point⁷ in order to be able to determine this coefficient at a Service Measurement Point located between the Access Point and the connection point of the Technical Unit to the internal grid of the Elia Grid User. This option is subject to the agreement of the VSP (for example if appropriate measurement devices of the voltage and the ~~reactive power~~ Reactive Power and a metering device of the ~~reactive power~~ Reactive Power exist at this point and measurement values can be communicated to Elia in real-time). Under these conditions, this point can then be defined as the Service Measurement Point as per Art I.1.1.
- Or to allow only the delivery of the Manual Control Service Type by the concerned Technical Unit at the Service Measurement Point

Manual Control Service Type

⁷ This option is not applicable for a Technical Unit providing the Service at an Interconnection Point i.e. located in a Public Distribution grid



Annex 13 Prequalification Procedure

The Manual Service Type requires that the Reactive Power produced or absorbed at the output of the Technical Unit has a visible impact on the Reactive power measured at the Service Measurement Point.

For any Technical Unit delivering the Service this relation must remain stable in time. Should this relation change in any way, the VSP commits to immediately notifying any change to Elia.

c) Determination of delivery control modalities

According to results of analyses in all previous steps, Elia and the VSP shall determine together the modalities ~~for delivery control~~ regarding the location of the Service Measurement Point according to dispositions of Art.I.1.1, Annex 6 and Annex 7, in relation to the Service Measurement Point and local grid influence.

As a result of this analysis Elia and the VSP(s) shall decide also on whether provision of the Service by more than one VSP shall be made possible downstream of an Access Point, and whether it is possible to consider cumulated measures of several Technical Units (as per Art. I.1.1 b)).

d) Prequalification Test

In order to validate all above modalities, the VSP and Elia must agree to execute a Prequalification Test.

During this test, the VSP shall perform an activation of the Automatic and/or Manual Control Service Type (depending on which of the Service Types he is providing).

In particular for the Automatic Control Service Type, he must, for the whole duration of the test, regulate his ~~injection~~ production or absorption of Reactive Power according to Grid Voltage according to requirements in Art. II.4. Moreover, during this same period, Elia will send one Setpoint ~~change~~ as per Annex 8 to which the VSP must react accordingly.

The test is considered successful if :

- e) the Technical Unit delivering the Automatic Control Service Type has correctly delivered the Service for all quarter-hours during a 10 hour period (as per rules in Annex 3), and has correctly reacted to the Setpoint ~~change~~-request (as per rules in Annex 4);
- f) the Technical Unit delivering the Manual Control Service Type has correctly reacted to the Setpoint ~~change~~-request (as per rules in Annex 4);

The test may be executed at a moment in time selected by the VSP and validated by Elia. The test is performed at the expenses of the VSP.