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Date: 24/09/2023 23:35:21

# ACER draft amendments to the Network Code on Requirements for Generators

Fields marked with * are mandatory.

## Introduction

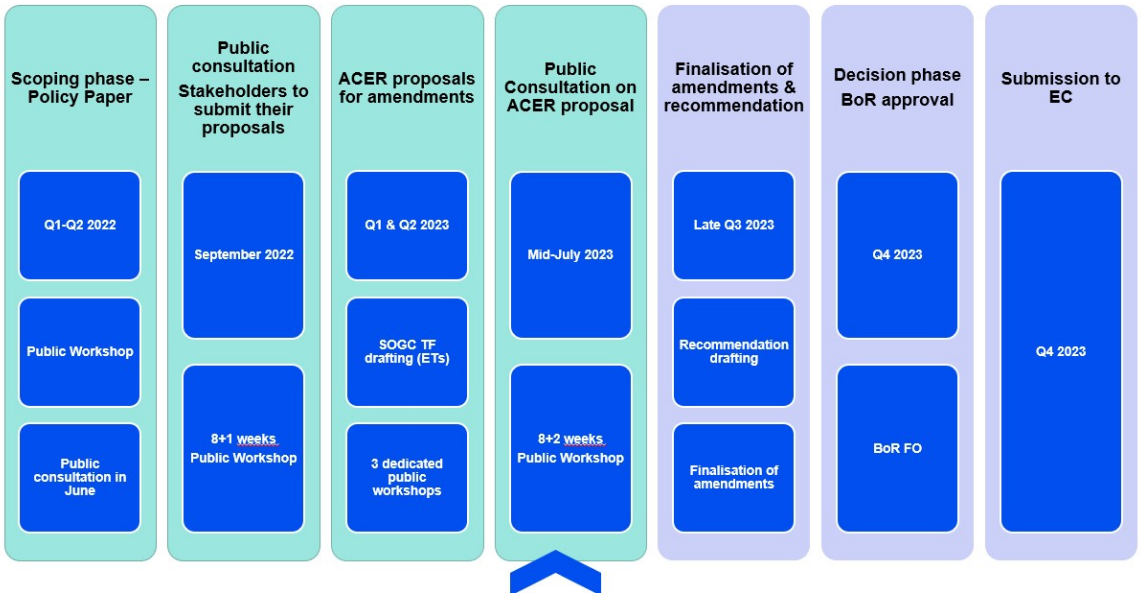
This consultation aims to present ACER's draft amendments to the Commission Regulation (EU) 2016/631 of 14 April 2016 establishing a **Network Code on Requirements for Grid Connection of Generators ('NC RfG').**
For draft amendments concerning Network Code on Demand Connection ('NC DC'), please go to the respective form: **NC DC**.

**Responses to this consultation should be submitted by 25 September 2023.**

## Background

Important developments in the policies of decarbonisation of the European Union (EU) energy and transport sectors have taken place since the inception of the development of the first European Grid Connection Network Codes (GC NCs) in 2012.

In the framework of the Grid Connection European Stakeholder Committee (GC ESC), the European Commission proposed for ACER to initiate the process towards the amendment of the existing GC NCs in September 2022. The amendment process, as presented to the GC ESC is outlined in the Figure below:



Following the scoping phase, ACER published the Policy Paper on the revision of the network code on requirements for grid connection of generators and the network code on demand connection in September 2022. The Policy Paper aimed to transparently indicate to stakeholders the key policy areas in which amendments were to be expected.

**Access the ACER Policy Paper on the revision of the NC RfG and NC DC.**

As a next step, ACER launched the Public Consultation to gather stakeholders' views and concrete amendment proposals regarding the GC NCs. The stakeholders could submit their inputs by 21 November 2022.

**Access the results of the Public Consultation on the amendments to the grid connection network codes.**

Additionally, in the preparation of the draft amendment proposals, ACER organised three dedicated public workshops, namely:

- electromobility, power-to-gas demand units and heat-pumps (held on 17 April 2023);
- rate of change of frequency and grid forming capabilities (held on 10 May 2023); and
- electricity storage (held on 11 May 2023).

After the evaluation of stakeholders' inputs, ACER has formulated its own proposal for the amendments of the GC NCs which is subject to this public consultation.

## Stakeholder's details

ACER is highly committed in processing personal data in a lawful way.
Find out more how we process your data: https://www.acer.europa.eu/the-agency/about-acer/data-protection

* Name of the stakeholder:

EUROPGEN Grid Codes Working Group

* Contact person:

[redacted]

* Contact person's email address:

[redacted]

* Country of the stakeholder's headquarters or main country of operation:

France

* Type of the stakeholder:

- ( ) Generator (including association)
- ( ) Consumer (including association)
- ( ) Transmission system operator (including association)
- ( ) Distribution system operator (including association)
- (•) Manufacturers (including association)
- ( ) Academia/research institution
- ( ) Regulatory authority
- ( ) Other (please, elaborate)

Please, elaborate on your answer above, if necessary:

EUROPGEN is the association for the European Generating Set Industry. The Grid Codes Working Group monitors updates to grid codes and related standards and communicates any changes and their effects to generator manufacturers.

* Do you consent to the publication of the stakeholder's name?

- (•) Yes
- ( ) No

* Do you consent to the publication of provided answers?

- (•) Yes
- ( ) No (please, note that your answer, without your name and organization, may be shared with the EU institutions and national authorities)

## Instructions

Stakeholders are invited to submit their comments to the NC RfG articles amended by ACER in three mandatory steps:
1. by downloading the ACER draft amendments in the Word file provided below. The file can also be accessed on the right panel of the consultation form under the Background Documents;
2. by commenting on the ACER's draft amendments through this online consultation form and adding their alternative text proposals to the table, if any; and
3. by uploading the alterative amendment proposals to the **entire NC RfG** using the Track Changes mode in the ACER draft amendments file downloaded from **Step 1**.

Where the stakeholder does not have any comments regarding the amendments, the relevant cells in the consultation form can be left blank.

The mandatory steps for submitting the comments are listed below.

## *Step 1*

Please see ACER's draft amendments in the Word file provided below. The file can also be accessed on the right panel of the consultation form under the Background Documents.

**Download ACER draft amendments to the NC RfG here**

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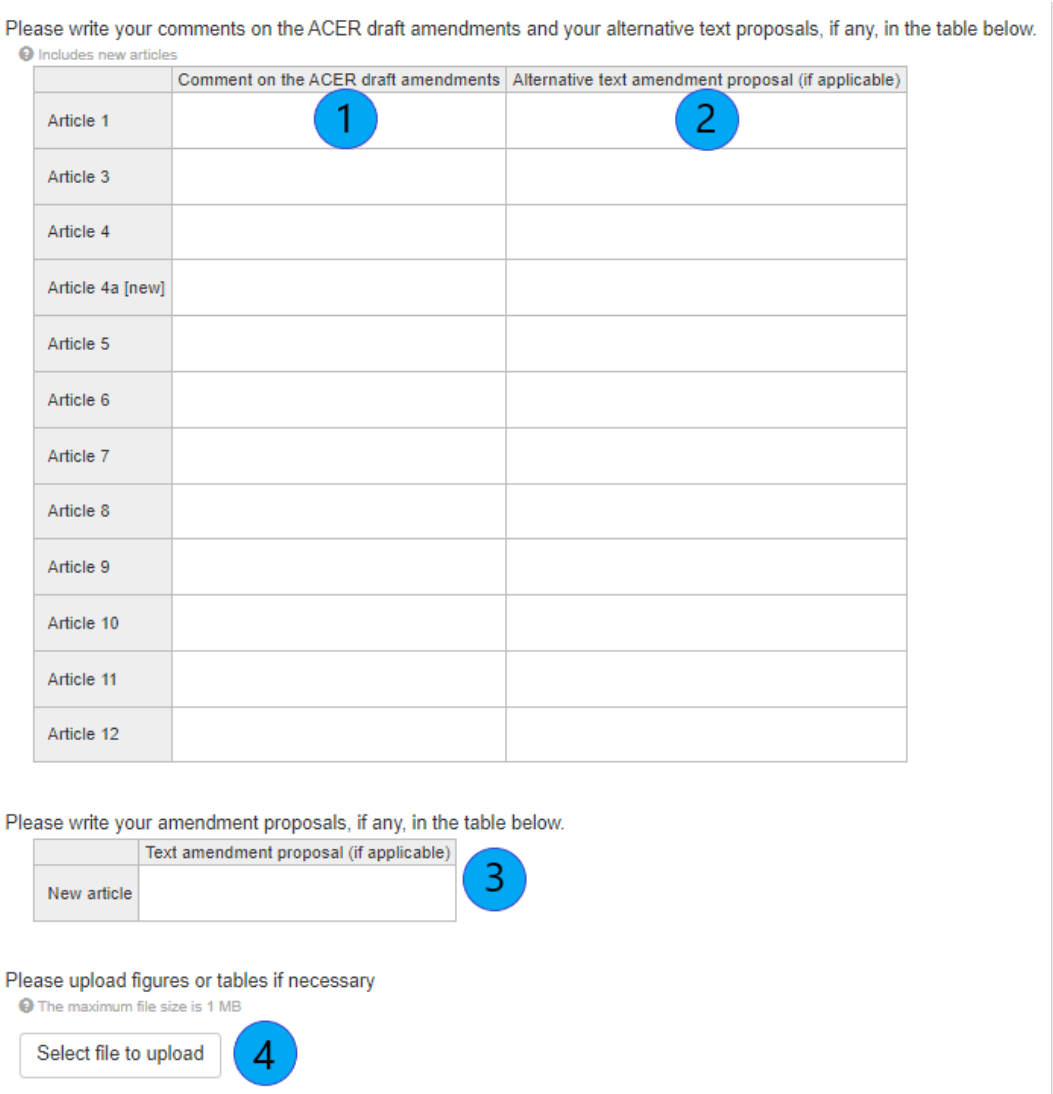
## *Step 2*

**Kindly note that this consultation form follows the structure of the NC RfG amended legal text provided by ACER in Step 1.**

The paragraph numbering in the form reflects paragraph numbers in the amended legal text. Nevertheless, stakeholders can comment on the deleted paragraphs/articles/titles, which are marked as [deleted]. New articles and titles are marked as [new].

Please use this form to comment on ACER draft amendments and/or to provide an alternative text proposal. The instructions are the following:




**1.** Leave comments on the ACER draft amendment proposals.
**2.** Propose (if any) alternative wording of the relevant provision, as you provided in the Word file.
**3.** Provide (if any) your proposals for adding new provisions to the relevant section of the NC RfG, as you provided in the Word file.
**4.** Upload figures or tables if necessary; text inputs should be provided directly in the consultation form.

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## *Step 3*

Where the stakeholder would like to propose an alternative amendment to the **entire NC RfG**, please upload the Word file (**downloaded from Step 1**) containing all your alternative amendment proposals in the Track Changes mode to the next **FILE UPLOAD** section and rename it with your stakeholder's name ("ACER_draft_RfG_stakeholder_name"). You can also upload your justification documents, where applicable.

**In case the file size exceeds the 1MB limit**, which is a consultation tool limit, kindly send the document to the functional mailbox shown on the right panel of the consultation form. Please rename the file with your stakeholder's name as indicated above and send it with the subject "ACER draft RfG legal text [stakeholder name]". Note that only submissions sent within the consultation deadline will be considered.

To facilitate the process, please, make sure that the **alternative text proposals provided in this consultation form are consistent**, to the extent possible, **with those in the Word file** you are uploading, taking into account the character limitations of each cell (max 5000 characters).

## FILE UPLOAD

Please upload your file here

The maximum file size is 1 MB
Only files of the type pdf,doc,docx,odt,txt,rtf are allowed

**Kindly note that in case the file size exceeds 1MB, the file can be sent to the functional mailbox shown on the right panel of the consultation form under Contact. Please ensure that the file name and email subject are consistent with the instructions in Step 3.**

Please also upload any other document (i.e. **justifications)** below, if relevant.

Please upload your file

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Due to the significant length of this survey:

- you have the possibility to edit your answer after submission. When clicking on "Submit" button, you will be given a Contribution ID which you can then use to access your answers and edit them, if necessary.
- we kindly suggest that you download the entire survey as .pdf (link on the right), prepare your answers and then upload them at once in the EU Survey Tool, to avoid a session timeout on submission.

The maximum length of each cell is 5000 characters. This is the maximum technical limit set by the EUsurvey tool, which cannot be increased.

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

Numbers in the first column correspond to the recitals of the amended version of NC RfG Whereas section, including new recitals

| | Comment on the ACER draft amendments | Alternative text amendment proposal (if applicable) |
|---|---|---|
| (1) | | |
| (2) | | |
| (3) | | |
| (s1) | | |
| (s2) | | |
| (4) | | |
| (5) | | |
| (6) | | |
| (7) | | |
| (8) | | |
| (9) | (MAJOR CONCERN FOR EUROPGEN)<br>With the existing text, the case of a synchronous machine which CAN be operated independently from others is left ambiguous – further wording changes are needed, as proposed.<br>The word “INDIVIDUAL” is key here – it is essential to include wording that clarifies the classification of a synchronous machine should be based on the INDIVIDUAL machine capacity where they CAN be operated independently, and NOT the whole capacity of the installation. | The significance of power-generating modules should be based on their size and their effect on the overall system. Synchronous machines should be classed on the machine size and include all the components of a generating facility that normally run indivisibly. Therefore, an installation containing a set of synchronous machines that can be operated independently from each other, such as diesel or gas reciprocating engine-driven synchronous generating units, should be assessed on the individual machine size and not the whole capacity of that installation. An installation containing a set of synchronous machines that cannot be operated independently from each |

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| | | other, such as combined-cycle gas turbine installation, should be assessed on the whole capacity of that installation. |
| (10) | | |
| (**) | | |
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| (31) | | |
| (32) | | |

Please write your amendment proposals, if any, in the table below

| | Text amendment proposal (if applicable) |
|---|---|
| New recital | |

## Definitions (Article 2)

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

Includes new definitions

| | Comment on the ACER draft amendments | Alternative text amendment proposal (if applicable) |
|---|---|---|
| Article 2(1) | | |
| Article 2(2) | | |
| Article 2(3) | | |
| Article 2(4) | | |
| Article 2(5) | | |
| Article 2(6) | | |
| Article 2(7) | | |
| Article 2(8) | | |
| Article 2(9) | (MAJOR CONCERN FOR EUROPGEN) Following the comments provided in 'Whereas (9)' relating to synchronous machine classification it is extremely important to clarify that a SPGM can be an individual machine in the case where it CAN be operated (started, stopped, synchronized, tripped) independently from other machines. | 'synchronous power-generating module' means an individual machine which can be operated independently from others, or a set of machines which cannot be operated independently from each other and can generate electrical energy such that the frequency of the generated voltage, the generator speed and the frequency of network voltage are in a constant ratio and thus in synchronism; |
| Article 2(10) | | |
| Article 2(10a) | | |
| Article 2(11) | | |
| Article 2(12) | | |
| Article 2(13) | | |
| Article 2(14) | | |
| Article 2(15) | | |
| Article 2(16) | | |
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| Article 2(17) | | |
| Article 2(18) | | |
| Article 2(19) | | |
| Article 2(20) | | |
| Article 2(21) | | |
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| Article 2(23) | | |
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| Article 2(28) | | |
| Article 2(29) | | |
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| Article 2(42) | | |
| Article 2(43) | | |
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| Article 2(45) | | |

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| Article 2(46) | | |
| Article 2(47) | | |
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| Article 2(70) | | |
| Article 2(71) | | |
| Article 2(72) | | |
| Article 2(73) | | |
| Article 2(74) | | |

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| Article 2(75) | | |

Please write your amendment proposals, if any, in the table below

| | Text amendment proposal (if applicable) |
|---|---|
| New definition | EUROPGEN supports the proposal for the following new definitions as recommended by the Expert Group on Harmonized Certification and Product Family Grouping (EG HCF), required to support the proposed new article ZZ (after article 43).<br><br>‘power generating unit’ or “PGU” means an aggregation of components converting a primary source of energy into electricity at the unit’s terminals, which is synchronously connected to a network or which is either non-synchronously connected to a network or connected through power electronics.<br><br>‘component’ means any hardware element or software element having an impact on the electrical characteristics and /or operation of a power generating unit or a power-generating module.<br><br>‘power generating unit family’ or ‘PGU family’ means a group of PGUs from the same manufacturer with equivalent characteristics to the representative unit which has undergone conformance tests (tested unit), in terms of electrical performance. PGU family members may differ in power and voltage from the representative unit. The extent of the PGU family will be defined within the compliance scheme.<br><br>‘component family’ means a group of components from the same manufacturer with equivalent characteristics to the representative component which has undergone conformance tests (tested component), in terms of electrical performance. The extent of the component family will be defined within the compliance scheme.<br><br>‘compliance scheme’ means a compliance verification programme provided by the relevant system operator which shall specify all evaluation and assessment measures to be taken, e.g. equipment certificates, tests, technical documentation and/or simulations, aimed to demonstrate the compliance of a PGM with the specified requirements during the operational |

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| | notification process. The compliance scheme shall provide detailed information on the specified requirements or provide unambiguous references to relevant technical documents and standards. The compliance scheme may specify the format of the statement of compliance as well as further procedural information for embedding the statement of compliance in the operational notification process. Where equipment certificates are applied within the compliance scheme the scheme shall include or provide a reference to a certification scheme. The applied equipment certificates must be valid for the specific equipment installed within the PGM for which a connection request has been made.<br><br>‘specified requirements’ are provisions on power generation units, power generation modules or their components which must be fulfilled.<br><br>‘statement of conformity’ means an attestation based on a conformity assessment that the fulfilment of specified requirements has been successfully demonstrated. The statement of conformity is provided in the equipment certificate. |

Please upload figures or tables if necessary

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## TITLE I - General provisions

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

Includes new articles

| | Comment on the ACER draft amendments | Alternative text amendment proposal (if applicable) |
|---|---|---|
| Article 1 | | |
| Article 3 | | |
| Article 4 | | |
| Article 4a [new] | Sub-paragraph 2(a):<br>Reference Value for % is missing. Please specify.<br><br>Sub-paragraph 2(b):<br>Reference Value for % is missing. Please specify. Proposal 5-20 %<br><br>Sub-paragraph 2(c):<br>The assessment, whether a modernisation of an existing power plant leads to “a change in frequency stability and active power management capabilities” lacks precise and unambiguous success criteria. → Propose to be removed. | Sub-paragraph 2(a):<br>[…] a minimum percentage to be defined in the range 5-20 % of existing maximum capacity […].<br><br>Sub-paragraph 2(b):<br>[…] of a minimum percentage to be defined in the range 5-20 % of existing reactive power capability;<br><br>Sub-paragraph 2(c): DELETE |
| Article 5 | | |
| Article 6 | | |
| | EUROPGEN supports the proposal for this new sub-paragraph as recommended by the Expert Group on Harmonized Certification and Product Family Grouping (EG HCF). | NEW sub-paragraph (10):<br>10. The relevant system operator or TSO shall submit a proposal for a detailed compliance scheme updated including the use of equipment certificate, for approval by the designated entity within 18 months from the entry into force of this Regulation. The Member State may provide for a |

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| Article 7 | As discussed with ENTSO-E, there is a need to state the responsibility of the RSO to provide a compliance scheme. The proposed new sub-paragraph helps to explain what is needed. | shorter time. In this case, the Member State shall communicate the shorter time period to the European Union Agency for the Cooperation of Energy Regulators (ACER). The RSO and TSO shall coordinate the details of the compliance scheme with relevant stakeholders including manufacturers. |
| Article 8 | | |
| Article 9 | | |
| Article 10 | | |
| Article 11 | | |
| Article 12 | | |

Please write your amendment proposals, if any, in the table below

| | Text amendment proposal (if applicable) |
|---|---|
| New article | |

Please upload figures or tables if necessary

The maximum file size is 1 MB

## TITLE II CHAPTER 1 - General Requirements

**General requirements for type A power-generating modules**

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

Includes new paragraphs

| | Comment on the ACER draft amendments | Alternative text amendment proposal (if applicable) |
|---|---|---|
| Article 13(1) | | |
| Article 13(2) | Sub-paragraph 13(2)(d):<br>Operation outside the 47-52 Hz range is not considered for the design of SPGMs; IEC 60034-1 does not conceive operation up to 52.5 Hz, so possible rework with both synchronous generator manufacturer and general auxiliaries manufacturers would be needed. Propose to remove this requirement. | Sub-paragraph 13(2)(d): DELETE |
| | Sub-paragraph (g):<br>(MAJOR CONCERN FOR EUROPGEN)<br>**VERY IMPORTANT ISSUE**<br>As commented by EUROPGEN in the first public consultation, the response time requirement of “less or equal to 8 seconds for an active power setpoint change of 45% maximum power” CANNOT BE ACHIEVED by some technologies including gas reciprocating engine-driven synchronous power-generating units. This statement has been made clearly in an industry statement published by EUGINE: https://www.eugine.eu/wp-content/uploads/2022/04/EUGINE_TF_CNC_2019-01-10_LFSM-O_-_Industry_statement.pdf<br>If the current draft text is adopted into legal text this will effectively exclude some manufacturers from the market, which is NOT ACCEPTABLE. It is acknowledged that there is a caveat stating, | |

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| Article 13(3) | “If the response time is greater than stated above, the power-generating facility owner shall justify the delay, providing technical evidence to the relevant TSO”, however THIS IS NOT ENOUGH!! There is a similar statement already in the IGD on LFSM-O, but there are some countries enforcing the response time without ANY possibility of deviation, or poorly defined processes to obtain a derogation.<br>EUROPGEN DEMANDS that this response time MUST be reconsidered and as a minimum there is an allowance for gas reciprocating engine-driven synchronous generating units. It is proposed to align the requirement with the relevant section of EN50549-2 Edition 1.1, which has been developed based on agreement and input from manufacturers – see amended text proposal.<br>PLEASE engage EUROPGEN and EUGINE and others for further consultation on this issue BEFORE publishing a final draft!!<br><br>Sub-paragraph (h):<br>If the set value is a very small value, then the tolerance is almost impossible to achieve. For example, if the set value is 0.1pu, then 90% of this value would be 0.09pu. In effect, the response time may therefore be infinite if the power control capability of the PGU is not within +/-0.01pu, which is virtually impossible to achieve. A review of how this is defined must therefore be undertaken….. suggestion is to define a +/- tolerance as percent of maximum /rated power which is more feasible to achieve. | Sub-paragraph (g):<br>The response time, Tresp in Figure XX, for active power decrease in case of increasing frequency, shall be as described below:<br><br>(i) For PV and battery inverters less than or equal to 1 s for ΔP of 100% Pmax.<br>(ii) For wind turbines less than or equal to 2 s for ΔP of 50% Pmax.<br>(iii) For combustion engines, gas turbines, fuel cells below 2 MW, less than or equal to 60 s for ΔP of 66% Pmax.<br>(iv) For combustion engines, gas turbines, fuel cells above 2 MW, less than or equal to 60 s for ΔP of 20% Pmax.<br>If the response time is greater than stated above, the power-generating facility owner shall justify the delay, providing technical evidence to the relevant TSO.<br><br>Sub-paragraph (h):<br>Modify Figure XX: Tresp shall end at reaching a suggested tolerance of +/-10% of maximum /rated power around the set value, not 90 % of set value. |

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| | Sub-paragraph (h):<br>Threshold and further instructions are left to be defined by the TSO. A min/max or default value should be provided in case TSO is missing this value on its documents. | |
| Article 13(4) | | |
| Article 13(5) | | |
| Article 13(6) | | |
| Article 13(7) | A definition of 'Input port' is required to remove ambiguity. Should this be a discrete input to a power generating unit controller, or a command provided over a communication protocol?<br>Further clarification is required. | |
| Article 13(8) | | |
| Article 13(9) | | |
| Article 13(10) | Wording is ambiguous leading to multiple possible interpretations:<br>Interpretation 1: According to this requirement, all existing reactive power modes such as Q(U), Q(P), cos(phi) shall be discarded and replaced by voltage control mode only.<br>Interpretation 2: According to this requirement a voltage control mode shall be added to the other modes such as Q(U), Q(P), cos(phi)...<br>Interpretation 3: According to this requirement a voltage control shall be the underlying control circuit, biased by the other reactive power control modes, such as Q(U), cos(phi),…<br>Interpretation 4: According to this requirement a voltage control mode shall be available but | The power generating module shall have the capability to regulate its terminal voltage at a selectable setpoint without instability over the entire operating range of the power-generating module..... |

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| | doesn’t have to be active during mains parallel operation in undisturbed conditions.<br>Conclusion: Wording of the paragraph needs to be changed to remove ambiguity and clarify what is the intent of the requirement. | |
| Article 13(11) | | |
| Article 13(12) | | |
| Article 13(13) | | |
| Article 13(14) | | |

Please write your amendment proposals, if any, in the table below

| | Text amendment proposal (if applicable) |
|---|---|
| New provision | |

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**[NEW] General requirements for type EV1 and EV2 V2G electric vehicles and associated V2G electric vehicle supply equipment**

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

| | Comment on the ACER draft amendments | Alternative text amendment proposal (if applicable) |
|---|---|---|
| Article 13a(1) | | |
| Article 13a(2) | | |
| Article 13a(3) | | |
| Article 13a(4) | | |
| Article 13a(5) | | |
| Article 13a(6) | | |
| Article 13a(7) | | |
| Article 13a(8) | | |
| Article 13a(9) | | |
| Article 13a(10) | | |
| Article 13a(11) | | |

Please write your amendment proposals, if any, in the table below

| | Text amendment proposal (if applicable) |
|---|---|
| New provision | |

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**General requirements for type B power-generating modules**

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

| | Comment on the ACER draft amendments | Alternative text amendment proposal (if applicable) |
|---|---|---|
| Article 14(1) | | |
| Article 14(2)[deleted] | | |
| Article 14(2) | | |
| Article 14(3) | Sub-paragraph (a):<br>Paragraph 2 of this article specifies voltage levels only for 110 kV and above. Please add reference to paragraph 12 of Article 13.<br><br>Sub-paragraph (c):<br>Paragraph 2 of this article specifies voltage levels only for 110 kV and above. Add reference to paragraph 12 of Article 13.<br><br>Sub-paragraph (c):<br>(MAJOR CONCERN FOR EUROPGEN)<br>The high-voltage ride-through profile should NOT exceed EN 50549-2 (Section 4.5.4) which is the European standard applicable to Type B.<br>Alignment of Figure X “High voltage-ride-through profile of a power-generating module” with EN50549-2 Figure 8 is proposed:<br>125% Un for 100ms<br>120% Un for 5s<br>115% Un for 60s | Sub-paragraph (a):<br>Table 3.1.1, line Urec2: Minimum voltage specified in paragraph (2) and Article 13 (12).<br><br>Sub-paragraph (c):<br>Figure X, caption: Urecf is the maximum voltage specified in paragraph 2 and Article 13 (12).<br><br>Sub-paragraph (c):<br>Align OVRT requirement with EN50549-2, section 4.5.4, Figure 8 |
| Article 14(4) | | |
| Article 14(5) | Sub-paragraph 5(d)(v):<br>The term “quality of supply and dynamic system behaviour monitoring” is ambiguous. Is this different | Sub-paragraph 5(d)(v):<br>the facilities for fault recording shall include… |

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| | from fault recording? For clarity the same wording as in (iii) and (iv) should be used. | |

Please write your amendment proposals, if any, in the table below

| | Text amendment proposal (if applicable) |
|---|---|
| New provision | |

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**[NEW] Requirements for type EV3 electric vehicles and associated V2G electric vehicle supply equipment and V2G electrical charging parks**

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

| | Comment on the ACER draft amendments | Alternative text amendment proposal (if applicable) |
|---|---|---|
| Article 14a(1) | | |
| Article 14a(2) | | |
| Article 14a(3) | | |
| Article 14a(4) | | |
| Article 14a(5) | | |
| Article 14a(6) | | |
| Article 14a(7) | | |
| Article 14a(8) | | |

Please write your amendment proposals, if any, in the table below

| | Text amendment proposal (if applicable) |
|---|---|
| New provision | |

Please upload figures or tables if necessary

The maximum file size is 1 MB

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**General requirements for type C power-generating modules**

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

| | Comment on the ACER draft amendments | Alternative text amendment proposal (if applicable) |
|---|---|---|
| Article 15(1) | | |
| Article 15(2) | Sub-paragraph 2(c)(i):<br>As Δf1 is given as positive value threshold must be specified as 50Hz-Δf1<br><br>Sub-paragraph 2(d):<br>If max value for \|Δfi\| is reduced to 15 mHz, max percentage value also must be reduced. | Sub-paragraph 2(c)(i):<br>The frequency threshold shall be 50Hz -Δf1, where…<br><br>Sub-paragraph 2(d):<br>Table 4 \|Δfi\|/fn = 0,02-0,03 % |
| Article 15(3)[deleted] | | |
| Article 15(3) | | |
| Article 15(4) | Sub-paragraph 4(a)(iv):<br>Article 14(2) specifies voltage levels only for 110 kV and above. Add reference to paragraph 12 of Article 13. | Sub-paragraph 4(a)(iv):<br>… and within the voltage limits laid down in Article 14 (2) and Article 13(12); |
| Article 15(5) | | |

Please write your amendment proposals, if any, in the table below

| | Text amendment proposal (if applicable) |
|---|---|
| New provision | |

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**General requirements for type D power-generating modules**

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

| | Comment on the ACER draft amendments | Alternative text amendment proposal (if applicable) |
|---|---|---|
| Article 16(1) | | |
| Article 16(2) | | |
| Article 16(3) | | |
| Article 16(4) | | |

Please write your amendment proposals, if any, in the table below

| | Text amendment proposal (if applicable) |
|---|---|
| New provision | |

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## TITLE II CHAPTER 2 - Requirements for synchronous power-generating modules

**[NEW] Requirements for type A synchronous power-generating modules**

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

| | Comment on the ACER draft amendments | Alternative text amendment proposal (if applicable) |
|---|---|---|
| Article X | | |

Please write your amendment proposals, if any, in the table below

| | Text amendment proposal (if applicable) |
|---|---|
| New provision | |

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**Requirements for type B synchronous power-generating modules**

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

| | Comment on the ACER draft amendments | Alternative text amendment proposal (if applicable) |
|---|---|---|
| Article 17(1) | | |
| Article 17(2) | Sub-paragraph (b):<br>Wording is ambiguous leading to multiple possible interpretations:<br>Interpretation 1: According to this requirement, all existing reactive power modes such as Q(U), Q(P), cos(phi) shall be discarded and replaced by voltage control mode only.<br>Interpretation 2: According to this requirement a voltage control mode shall be added to the other modes such as Q(U), Q(P), cos(phi)...<br>Interpretation 3: According to this requirement a voltage control shall be the underlying control circuit, biased by the other reactive power control modes, such as Q(U), cos(phi),…<br>Interpretation 4: According to this requirement a voltage control mode shall be available but doesn't have to be active during mains parallel operation in undisturbed conditions.<br>Conclusion: Wording of the paragraph needs to be changed to remove ambiguity and clarify what is the intent.<br><br>Sub-paragraph (b):<br>Remove under and over-excitation limiter requirements as it is not within the responsibility of RfG to specify the method of implementation within the power generating units. This is a matter of system design of power-generating units. | Sub-paragraph (b):<br>[…] with regard to voltage control, type B synchronous power generating modules shall have the capability to provide constant alternator terminal voltage at a selectable setpoint without instability over the entire operating range of the synchronous power-generating module.<br><br>Sub-paragraph (b): |

| | | |
|---|---|---|
| | For example, OEL/UEL functionality could be realised by a different method, or by a different control device external to the voltage regulator. The authors' comments that this is "a standard feature of AVRs and is therefore available at no additional cost" is wholly inaccurate for smaller PGMs. All functions and features have some cost associated. | […] The voltage control system shall include a method of limiting excitation and/or reactive power, without disconnection, to prevent operation in an under or over-excited condition that may risk angular instability or exceed thermal design limits. |
| Article 17(3) | | |

Please write your amendment proposals, if any, in the table below

| | Text amendment proposal (if applicable) |
|---|---|
| New provision | |

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**Requirements for type C synchronous power-generating modules**

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

| | Comment on the ACER draft amendments | Alternative text amendment proposal (if applicable) |
|---|---|---|
| Article 18(1) | | |
| Article 18(2) | Sub-paragraph (b)(ii):<br>In Article 13 (10) no maximum and minimum voltage level is given.<br><br>In context of synchronous machines terms like consumption, production, lead, lag, positive, negative,… may lead to ambiguity, if used to specify the operating quadrants for active and reactive power. | Sub-paragraph (b)(ii):<br>Figure 7: Maximum and minimum voltage level need to refer to Article 13(12) and Article 14(2).<br>Figure 7: Replace “consumption (lead)” by “Under-excited operation” and “Production (lag)” by “Over-excited operation” |

Please write your amendment proposals, if any, in the table below

| | Text amendment proposal (if applicable) |
|---|---|
| New provision | |

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**Requirements for type D synchronous power-generating modules**

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

Includes new paragraphs

| | Comment on the ACER draft amendments | Alternative text amendment proposal (if applicable) |
|---|---|---|
| Article 19(1) | | |
| Article 19(2) | Sub-paragraph 2(a):<br>It is comprehensible to require, that excitation control shall operate without instability over the entire operating range.<br>But it is not within the responsibility of RfG to require certain methods of implementation / realisation within the power generating units.<br>This is a matter of system design of power-generating units.<br>In addition, the PSS function doesn't have to be necessarily part of the AVR (internal) but be also an external piece of equipment, acting on the output of the overall excitation system. So, PSS requirement shall be outside AVR requirements. | Sub-paragraph 2(a):<br>2. Type D synchronous power-generating modules shall fulfil the following additional requirements in relation to voltage stability:<br>(a) equipped with:<br>(i) a method of limiting excitation and/or reactive power, without disconnection, to prevent operation in an under or over-excited condition that may risk angular instability or exceed thermal design limits.<br>(ii) a PSS function..... |
| Article 19(3) | | |
| Article 19(4) | | |

Please write your amendment proposals, if any, in the table below

| | Text amendment proposal (if applicable) |
|---|---|
| New provision | |

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## TITLE II CHAPTER 3 - Requirements for power park modules

**[NEW] Requirements for type A power park modules**

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

| | Comment on the ACER draft amendments | Alternative text amendment proposal (if applicable) |
|---|---|---|
| Article Y(1) | | |
| Article Y(2) | | |
| Article Y(3) | | |
| Article Y(4) | | |
| Article Y(5) | | |
| Article Y(6) | | |
| Article Y(7) | | |
| Article Y(8) | | |

Please write your amendment proposals, if any, in the table below

| | Text amendment proposal (if applicable) |
|---|---|
| New provision | |

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**Requirements for type B power park modules**

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

Includes new paragraphs

| | Comment on the ACER draft amendments | Alternative text amendment proposal (if applicable) |
|---|---|---|
| Article 20(1) | | |
| Article 20(2) | | |
| Article 20(3) | | |
| Article 20(4) | | |

Please write your amendment proposals, if any, in the table below

| | Text amendment proposal (if applicable) |
|---|---|
| New provision | |

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**Requirements for type C power park modules**

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

Includes new paragraphs

| | Comment on the ACER draft amendments | Alternative text amendment proposal (if applicable) |
|---|---|---|
| Article 21(1) | | |
| Article 21(2) [deleted] | | |
| Article 21(2) | | |
| Article 21(3) | | |
| Article 21(4) | | |

Please write your amendment proposals, if any, in the table below

| | Text amendment proposal (if applicable) |
|---|---|
| New provision | |

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**Requirements for type D power park modules**

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

Includes new paragraphs

| | Comment on the ACER draft amendments | Alternative text amendment proposal (if applicable) |
|---|---|---|
| Article 22(1) | | |
| Article 22(2) | | |

Please write your amendment proposals, if any, in the table below

| | Text amendment proposal (if applicable) |
|---|---|
| New provision | |

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## TITLE II CHAPTER 4 - Requirements for offshore power park modules

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

| | Comment on the ACER draft amendments | Alternative text amendment proposal (if applicable) |
|---|---|---|
| Article 23 | | |
| Article 24 | | |
| Article 25 | | |
| Article 26 | | |
| Article 27 | | |
| Article 28 | | |

Please write your amendment proposals, if any, in the table below

| | Text amendment proposal (if applicable) |
|---|---|
| New article | |

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## TITLE III - Operational notification procedure for connection

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

Includes new articles

| | Comment on the ACER draft amendments | Alternative text amendment proposal (if applicable) |
|---|---|---|
| Article 29 | EUROPGEN supports the proposal for this new amendment and new sub-paragraphs as recommended by the Expert Group on Harmonized Certification and Product Family Grouping (EG HCF).<br>Modification of paragraph 2 brings the compliance scheme topic and the fact that it needs to be applied<br>new paragraphs ensure that an acceptance of equipment certificates is facilitated by a clear specification by the RSO on:<br>a) respectively accepted certification schemes, and;<br>b) respectively accepted specified requirements, e. g. grid codes, from other member states, on which the conformity assessment is performed. | 2. The relevant system operator shall clarify and make publicly available the details of the operational notification procedure which shall include the compliance scheme.<br>3. The compliance scheme shall address the use of equipment certificates of PGU and component.<br>4. The compliance scheme should refer to applicable international or European standards if available. |
| Article 30 | | |
| Article 30a [new] | | |
| Article 30b [new] | | |
| Article 31 | | |
| Article 32 | | |
| Article 33 | | |
| Article 34 | | |
| Article 35 | | |
| Article 36 | | |
| Article 37 | | |
| Article 38 | | |
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|---|---|---|
| Article 39 | | |

Please write your amendment proposals, if any, in the table below

| | Text amendment proposal (if applicable) |
|---|---|
| New article | |

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## TITLE IV - Compliance

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

| | Comment on the ACER draft amendments | Alternative text amendment proposal (if applicable) |
|---|---|---|
| Article 40 | | |
| Article 41 | | |
| Article 42 | | |
| Article 43 | | |
| Article 44 | | |
| Article 45 | | |
| Article 46 | | |
| Article 47 | | |
| Article 48 | | |
| Article 49 | | |
| Article 50 | | |
| | Sub-paragraph 2(d):<br>In Art. 51 (1) it is already specified, that, unless equipment certificates are provided to the relevant system operator, LFSM-O simulations must be conducted. If simulations are conducted, details are given in Art. 51 (2), subclauses (a), (b) and (c).<br>However, wording of Art. 51 / 2 (d) is ambiguous: “The TSO has the right to request a stability compliance…” → What is a stability compliance? A statement of compliance? Certificate of compliance? Simulation report? Please make wording more comprehensible, as proposed.<br><br>Sub-paragraph 3(a): | Sub-paragraph 2(d):<br>The relevant TSO has the right to request a statement of compliance for stability of the LFSM-O control in a close loop operation set up of the synchronous power-generating module.<br><br>Sub-paragraph 3(a): |

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|---|---|---|
| Article 51 | Same comment as 2(d) above - please make wording more comprehensible, as proposed.<br><br>Sub-paragraph 3(b):<br>Point (a) of Article 14(3) does not contain reactive power control requirements. Please link the correct article and paragraph as cross reference.<br><br>Sub-paragraph 3(b):<br>The possibility to use equipment certificates instead of simulations is missing.<br>The optimal solution would be to rephrase Art. 51 (1), to permit the use of equipment certificates instead of all or part of the simulations described in Art. 51 (2) to (6), in a similar way as Art. 52 (1) and Art. 53 (1).<br>Currently Art. 51 (1) only is referring to LFSM-O simulations.<br><br>Sub-paragraph 6:<br>The possibility to use equipment certificates instead of simulations is missing.<br>The optimal solution would be to rephrase Art. 51 (1), to permit the use of equipment certificates instead of all or part of the simulations described in Art. 51 (2) to (6), in a similar way as Art. 52 (1) and Art. 53 (1).<br>Currently Art. 51 (1) only is referring to LFSM-O simulations. | The relevant TSO has the right to request a statement of compliance for stability of reactive power capability control in a close loop operation set up of the synchronous power-generating module.<br><br>Sub-paragraph 3(b):<br>The simulation shall be deemed successful if compliance with the requirement set out in point (a) of Article 17(2) is demonstrated.<br><br>Sub-paragraph 3(b)- add text:<br>Instead of these simulations, the power-generating facility owner may use equipment certificates issued by an authorised certifier, which must shall be provided to the relevant system operator.<br><br>Sub-paragraph 6 - add text:<br>Instead of these simulations, the power-generating facility owner may use equipment certificates issued by an authorised certifier, which must shall be provided to the relevant system operator. |
| | | |

| | | |
|---|---|---|
| Article 52 | Sub-paragraph 2(d);<br>In Art. 52 (1) it is already specified, that, unless equipment certificates are provided to the relevant system operator, LFSM-U simulations must be conducted. If simulations are conducted, details are given in Art. 52 (2), subclauses (a), (b) and (c).<br>However, wording of Art. 52 / 2 (d) is ambiguous: “The TSO has the right to request a stability compliance…” → What is a stability compliance? A statement of compliance? Certificate of compliance? Simulation report? Please make wording more comprehensible as proposed. | Sub-paragraph 2(d):<br>The relevant TSO has the right to request a statement of compliance for stability of the LFSM-U control in a close loop operation set up of the synchronous power-generating module. |
| Article 53 | | |
| Article 54 | | |
| Article 55 | | |
| Article 56 | | |
| Article 57 | | |
| Article 58 | | |
| Article 59 | | |

Please write your amendment proposals, if any, in the table below

| | Text amendment proposal (if applicable) |
|---|---|
| New article | EUROPGEN supports the proposal for a new article as recommended by the Expert Group on Harmonized Certification and Product Family Grouping (EG HCF).<br>UNDER DISCUSSION WITH ENTSO-E<br>The intent of new article ZZ (after article 43) is to provide a detailed and harmonised framework on equipment certificates.<br>Following its conclusions in the final report the Expert Group is convinced that these clarifications provided in this new article will promote the provision and application of equipment certificates into the notification process and will, thus, reduce the struggle many MS are facing today due to unclear definitions and knowledge of formal requirements. Especially a clear obligation to the RSO to specify what certification programmes and requirements the RSO is willing to accept will help a lot to deploy certificates in the overall process.<br><br>NEW Article ZZ (after Article 43)<br>Common Provisions on Equipment Certificates<br><br>1. In the case that the compliance scheme specified by the RSO provides for the use of equipment certificates issued by an authorised certifier in the context of Title III and/or Title IV, the equipment certificates shall comply with the following provisions:<br>a) Any equipment certificate shall be based on the certification scheme as specified in the compliance scheme.<br>b) The equipment certificates are classified into PGU certificates, and component certificates and PGM certificates. The equipment certificates shall demonstrate the conformity with the specified requirements as defined in the compliance scheme by applying the respective evaluation and assessment measures according to the certification scheme.<br>c) Specified requirements referred to within equipment certificates may be defined by the requirements as set out in Title II, provided by a national implementation under this Regulation, by relevant internationally recognized European standards and/or alternative schemes that may |

| | |
|---|---|
| | also be applicable.<br><br>2. RSOs shall accept equipment certificates issued by authorized certifiers of other any Member States whose accreditation is given by the respective national affiliate of the European cooperation for Accreditation ('EA').<br><br>3. RSOs may accept equipment certificates that provide a statement of conformity with respect to specified requirements others than the requirements at national level implemented under this Regulation according to the provisions of Article 7 (1), i.e. the RSOs' national grid codes. In such case, the RSO shall specify the acceptance conditions within the compliance scheme, as well as which additional information needs to be provided in order to demonstrate the compliance of the equipment with the established requirements at national level implemented under this Regulation.<br><br>4. The compliance scheme defined by the RSO may define as eligible those equipment certificates where the statement of conformity covers only selected specified requirements (e.g. FRT, LFSM, etc.). These will be used within the compliance scheme required by the RSO.<br><br>5. RSOs may accept equipment certificates for PGU and/or components which belong to a family to the extent defined within the compliance scheme, required by each RSO, under which the assessed PGU and/or component is certified. This subset of PGUs and/or components shall comply with the definition for PGU family, if not otherwise defined in the compliance scheme. |

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## TITLE V - Derogations

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

| | Comment on the ACER draft amendments | Alternative text amendment proposal (if applicable) |
|---|---|---|
| Article 60 | | |
| Article 61 | | |
| Article 62 | | |
| Article 63 | | |
| Article 64 | | |
| Article 65 | | |

Please write your amendment proposals, if any, in the table below

| | Text amendment proposal (if applicable) |
|---|---|
| New article | |

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## [DELETED] TITLE VI - Transitional arrangements for emerging technologies

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

| | Comment on the ACER draft amendments | Alternative text amendment proposal (if applicable) |
|---|---|---|
| Title VI [deleted] | | |

## [NEW] TITLE VI - Transitional provisions

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

| | Comment on the ACER draft amendments | Alternative text amendment proposal (if applicable) |
|---|---|---|
| Article 70a [new] | | |

Please write your amendment proposals, if any, in the table below

| | Text amendment proposal (if applicable) |
|---|---|
| New article | |

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## TITLE VII - Final provisions

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

Includes new articles

| | Comment on the ACER draft amendments | Alternative text amendment proposal (if applicable) |
|---|---|---|
| Article 71 | | |
| Article 71a [new] | | |
| Article 72 | | |

Please write your amendment proposals, if any, in the table below

| | Text amendment proposal (if applicable) |
|---|---|
| New article | |

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## Other additional provisions

Please write your amendment proposals, if any, in the table below

| | Text amendment proposal (if applicable) |
|---|---|
| Other new provisions | |

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### Background Documents

NC_RfG_ACER_draft_amendments_for_PC_2023_E_07.docx

### Contact

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