



# **DECISION PAPER**

## **PROPOSED MODIFICATIONS TO THE TRANSMISSION CODE**

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## **1 Introduction**

- 1.1 The Transmission Code sets out the rights and obligations of the Transmission Licensee, together with the rights and obligations of users of the transmission system. The Transmission Code also sets out the technical requirements to be met by those who seek to connect and operate installations on the transmission system.

## **2 Proposed modifications to the Transmission Code**

- 2.1 Pursuant to Section 1.6 of the Transmission Code, EMA has sought representations on the proposed modifications to the Transmission Code to update and clarify the technical requirements relating to domestic solar photovoltaics (PV) generation facilities, i.e. solar PV generation facilities that are installed in Singapore. These proposed modifications do not preclude EMA from introducing requirements or mechanisms for domestic solar PV generation facilities relating to intermittency management such as energy storage systems, at a later stage, taking into account technological developments and power system needs.
- 2.2 We received feedback from four respondents by the closing of consultation on 1 July 2026.
- 2.3 EMA has reviewed the feedback pertaining to the proposed modifications and our responses are detailed in Annex 1.

## **3 EMA's Decision**

- 3.1 Taking into account the feedback received, EMA has decided to modify clauses of the Transmission Code as set out in Annex 2. The proposed modifications will come into effect on 9 Sep 2026.

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**EMA's Response to Written Representations**

| Modification Ref. No. | Clause  | Public/ Industry | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | EMA's Response                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
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| -                     | General | SP Group         | <p><b>SP Group:</b></p> <p>1. The term “domestic” may be subject to differing interpretations (e.g. residential installations versus installations located within Singapore). To avoid ambiguity, it would be preferable to replace this term with a more clearly defined description, such as “solar photovoltaic generation facilities installed in Singapore.”</p> <p>In SP's comments below, reference to “domestic” would imply “installed in Singapore” and not “residential”.</p> <p>2. In addition, Clause 2.2 of the Consultation Paper stipulates that Energy Storage Systems (ESS) may be introduced later.</p> <p>a) Given the rapid adoption of co-located Distributed Energy Resources (DERs), does EMA plan to issue an addendum for Hybrid Facilities (Solar Photovoltaic (PV) + Energy Storage Systems) in future and would this apply retrospectively to existing installations?</p> <p>b) If a consumer adds an ESS to an approved domestic solar PV facility after the initial PV installation, will the entire facility be re-evaluated under a separate set of hybrid</p> | <p>For clarity, “domestic solar PV generation facilities” refers to solar PV generation facilities installed in Singapore and is not limited to residential installations. EMA will consider whether further refinements to the drafting are required to avoid ambiguity.</p> <p>The present code modifications are intended to update and clarify requirements for domestic solar PV generation facilities. EMA may introduce requirements or mechanisms for ESS and hybrid facilities separately in future, taking into account technological developments and power system needs. Where such requirements are introduced, EMA will consider the appropriate scope of application and transitional arrangements, where relevant.</p> |

| Modification Ref. No. | Clause  | Public/ Industry | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | EMA's Response                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
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|                       |         |                  | <p>connection guidelines, or will it inherit the solar-only exemption clauses outlined in these modifications?</p> <p>If EMA plans to issue a subsequent modification to the Transmission Code on ESS, we would like to request that EMA clarifies the above queries in the modification.</p>                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| -                     | General | SP Group         | <p><b>SPPA/SPS:</b></p> <ol style="list-style-type: none"> <li>1. SPPA would like to highlight that apart from intermittency management, solar PV generation requires voltage management, which can be realised through means such as energy storage systems, increase of network capacity, reactive power support and amendments to allowable voltage limits. This should be included in the proposed modifications to provide clarity to the technical requirements.</li> </ol>                                                                          | <p>The current Code modifications shall focus on clarifying the technical requirements for domestic solar PV generation facilities.</p> <p>EMA recognises that voltage management may require a broader suite of measures, including network reinforcement, reactive power support, ESS and review of operational voltage limits. These matters may be considered separately, taking into account system needs and implementation feasibility.</p>                                                |
| TC/2026/20            | 4.2.3   | SP Group         | <p><b>SPPA/SPS:</b></p> <ol style="list-style-type: none"> <li>1. Please confirm that the term "consumer's installation" applies strictly to the total domestic solar capacity connected behind a single connection point to the transmission network.</li> <li>2. Consumer's installations and their physical connection points are assessed by the Transmission Licensee (TL). If a Virtual Power Plant (VPP) operator subsequently digitally aggregates the solar generation facilities across multiple geographical locations from multiple</li> </ol> | <p>EMA clarifies that the 1 MWac threshold applies to the aggregated capacity of domestic solar PV generating units connected to a consumer's installation at a single connection point to the transmission network.</p> <p>VPP arrangements are currently being piloted. As these arrangements continue to develop, their regulatory and technical treatment, including any implications for connection requirements, will be further considered in consultation with relevant stakeholders.</p> |

| Modification Ref. No. | Clause | Public/ Industry | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | EMA's Response                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
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|                       |        |                  | <p>consumer's installations, we would like to confirm that under Clause 4.2.3, there is no need to re-assess and re-submit the connection schemes due to the VPP's digital aggregation to the Power System Operator (PSO).</p> <p>3. Does the aggregated domestic solar capacity clause apply to existing consumer sites? For instance, if an existing consumer installed solar PV system with a capacity of 600kWac, subsequently added another 500kWac solar PV system, does the entire site (now totalling 1.1MWac) require a connection scheme review by the PSO?</p> <p>4. Please also confirm whether the aggregation rule applies retrospectively to existing consumer's installations? For example, large-scale facilities like Tuas Checkpoint (3.86 MWac), Panasonic Appliances R&amp;D Centre (1.74 MWac) and ST Engineering Defence Aviation Services (5.13 MWac) had installed multiple solar PV spread across different areas that aggregate to over 1 MWac threshold under a single point of connection. Does the entire site require PSO connection scheme review?</p> <p>5. The amendment to specify that the 1MWac applies to the "aggregated capacity" is only made for Clause 4.2.3. Please clarify if the same "aggregated capacity" applies for Clause 6.12.7 and F10 (on voltage detection at the connected person's incoming switchboard).</p> | <p>For existing consumer sites, where the addition or modification of solar PV results in the aggregated solar PV capacity at the site being equal to or exceeding 1 MWac, the connection scheme is required to be submitted to the Transmission Licensee for review as per current requirement under Transmission Code/market rules accordingly.</p> <p>Where additional solar PV capacity is installed at an existing consumer's installation and the aggregated capacity is equal to or exceeds 1 MWac, the Transmission Licensee shall assess whether the proposed connection scheme should be forwarded to PSO in accordance with Clause 4.2.3.</p> <p>Clause 6.12.7 is clear that the requirement applies to a solar PV system (of an installed capacity equal to or exceeding 1MWac) at each site. EMA will remove the footnote in F10 i.e. "**For large installation (&gt;1MWac) being connected to the HT network solely for the purpose of electricity export, the voltage is</p> |

| Modification Ref. No. | Clause | Public/ Industry | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | EMA's Response                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
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|                       |        |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | detected at the <i>connected person's</i> incoming switchboard." For avoidance of doubt, F10 shall apply to all solar PV.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| TC/2026/20            | 4.2.3  | SP Group         | <b>SPES:</b><br>1. We seek confirmation that the 1 MWac threshold is evaluated strictly based on the aggregate domestic solar capacity at the point of connection, rather than the net or gross electricity injection profiles into the grid. Please also clarify that this aggregation rule applies uniformly regardless of the system configuration - meaning no distinction is made between a direct-to-grid generation connection (front-the-meter) and an embedded (behind-the-meter) setup.                                         | <p>EMA clarifies that the 1 MWac threshold is assessed based on the aggregated installed AC capacity of domestic solar PV generating units connected at the relevant point of connection, i.e. the nameplate capacity of the solar PV installation, rather than on net or gross injection profiles.</p> <p>The aggregation approach applies regardless of whether the solar PV generating units are connected front-of-meter or behind-the-meter, insofar as they are connected to the transmission network through the relevant consumer's installation.</p>                                                        |
| TC/2026/21            | 6.6.1  | SP Group         | <b>SPS:</b><br>1. Please confirm if grid-forming inverters apply to PV inverters of all PV system capacity connected at all voltage levels, including those residential PV systems connected at the LV network.<br><br>2. Is this inverter requirement retrospectively applied to existing solar PV systems?<br><br>3. SPPA also requests for EMA to review if the inverters should be required to operate in Q(V) mode with a setpoint determined by the Transmission Licensee or Power System Operator to meet the requirement of being | <p>EMA clarifies that the grid-forming inverter requirement applies to new grid-connected domestic solar PV generating units from the effective date of the modifications, including those connected at low voltage, unless otherwise specified. The requirement is not intended to apply retrospectively to existing solar PV systems, unless the system is subsequently recommissioned or materially modified, such as through a change in installed capacity or replacement of its inverters(s), in which case the prevailing requirements may apply.</p> <p>The connected person is responsible for ensuring</p> |

| Modification Ref. No. | Clause | Public/ Industry | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | EMA's Response                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
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|                       |        |                  | capable of operating at a power factor of 0.9 leading to 0.9 lagging.<br><br>4. We would like to reiterate that the respective licensee or connected person who owns and operates the system should be the party responsible for ensuring and demonstrating compliance with this requirement, including declaring their compliance before the connection is energised.                                                                                                    | and demonstrating compliance with the applicable requirements before energisation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| TC/2026/21            | 6.6.1  | SP Group         | <b>SPES:</b><br>1. Please clarify what are the requirements for grid-forming inverters.                                                                                                                                                                                                                                                                                                                                                                                   | The proposed modification is intended to require new grid-connected domestic solar PV generating units to be installed with inverters capable of supporting grid-forming functionality and operating within the specified power factor range. EMA is reviewing the detailed technical requirements for grid-forming functionality and welcomes industry feedback to inform the development of these requirements.                                                                                                                                                        |
| TC/2026/22            | C4.1   | SP Group         | <b>SPPA/SPS:</b><br>1. We would like to clarify whether this clause applies to embedded hybrid facilities (i.e. co-location of Domestic Solar PV + ESS). In addition, would the ESS component of a hybrid facility be subjected to separate central dispatch under the Transmission Code?<br><br>2. Please also clarify if co-locating Solar with ESS would shift the classification from a non-dispatchable intermittent resource to a dispatchable generating facility. | The proposed exemption under Clause C4.1 is intended to apply to domestic solar PV generation facilities, which are intermittent generation facilities. The treatment of co-located ESS or hybrid facilities will depend on the configuration, mode of operation and applicable licensing or market registration requirements. EMA may provide separate requirements for ESS and hybrid facilities where necessary.<br><br>Co-location of ESS with solar PV does not automatically change the classification of the solar PV component. However, where the ESS component |

| Modification Ref. No. | Clause | Public/ Industry | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                         | EMA's Response                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
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|                       |        |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                  | is operated in a manner that is dispatchable or participates in market or system services, separate requirements may apply.                                                                                                                                                                                                                                                                                                                                                                              |
| TC/2026/24            | F8.1   | SP Group         | <b>SPPA/SPS:</b><br>1. Please clarify if the exemption from the mandatory minimum primary/spinning reserve fuel requirements applies equally to co-located hybrid facilities (i.e., domestic solar PV installations paired with ESS).                                                                                                                                                                                                            | The exemption from the mandatory minimum primary/spinning reserve fuel requirements applies to domestic solar PV generation facilities. The applicability of this exemption to hybrid facilities with co-located ESS will be considered separately, taking into account the ESS configuration, operating mode and whether the facility provides dispatchable services.                                                                                                                                   |
| TC/2026/28            | H4.2   | SP Group         | <b>SPES:</b><br>1. We seek clarification on whether the real-time measurement requirements under Clause H4.2.1 (a), (h), H4.2.2 (a), (b), (d), (e), H4.2.3 (b) are applicable to solar PV systems.<br><br>2. We suggest that all measurement requirements specific to solar PV systems be consolidated under Clause H4.3, as this clause is intended to address solar PV systems specifically. This would improve clarity and ease of reference. | Clause H4.2 sets out general requirements for generating stations, while Clause H4.3 sets out requirements specific to solar PV systems. The proposed amendment to Clause H4.2 is intended to exclude certain H4.2 requirements that are not applicable to domestic solar PV generation facilities. EMA notes the suggestion to consolidate solar-specific requirements under Clause H4.3 and will consider whether further drafting refinements are necessary to improve clarity and ease of reference. |
| TC/2026/29            | H4.3   | SP Group         | <b>SPPA/SPS:</b><br>1. We seek clarification if the modified text "domestic solar photovoltaic generating unit(s) of aggregated capacity 1MWac and above" will apply to the updated measurement requirement in H4.3.                                                                                                                                                                                                                             | The updated measurement requirement in Clause H4.3 applies to domestic solar PV systems to which the relevant monitoring requirements apply, including systems of aggregated capacity 1 MWac and above where required under the Transmission Code and the applicable connection requirements.                                                                                                                                                                                                            |

| Modification Ref. No. | Clause  | Public/ Industry                 | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | EMA's Response                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
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| -                     | General | YTL PowerSeraya                  | The Transmission Code should be further updated to provide clarity on the applicable technical requirements for other types of generating facilities, such as energy storage system.                                                                                                                                                                                                                                                                                       | The present modifications are focused on domestic solar PV generation facilities. EMA may review and introduce separate technical requirements for other types of generating facilities, including ESS, where necessary, taking into account system needs, technology developments and implementation considerations.                                                                                                                                                                                 |
| TC/2026/21            | 6.6.1   | EDP Renewables APC               | <ul style="list-style-type: none"> <li>Does this requirement apply to Wholesaler Licensee with grid-connected solar photovoltaic generating units?</li> <li>Does this requirement apply to all grid-connected solar photovoltaic generating units regardless of installed capacity?</li> <li>Does this requirement apply to all grid-connected solar photovoltaic generating units regardless of whether it is connected at front-of-meter or behind-the-meter?</li> </ul> | <p>The requirement applies to new grid-connected domestic solar PV generating units from the effective date of the modifications, regardless of whether the connected person is a Wholesaler Licensee or not.</p> <p>The requirement applies across system configurations, including front-of-meter and behind-the-meter installations, unless otherwise specified. EMA will consider whether further clarification is required on the applicable capacity threshold and implementation approach.</p> |
| TC/2026/29            | H4.3    | EDP Renewables APC               | <ul style="list-style-type: none"> <li>Can we clarify on the rationale for measuring reactive power from domestic solar photovoltaic systems?</li> </ul>                                                                                                                                                                                                                                                                                                                   | Reactive power measurement supports PSO's and the Transmission Licensee's visibility of the reactive power behaviour of solar PV systems, which is relevant for voltage management and secure operation of the power system, particularly as solar PV penetration increases.                                                                                                                                                                                                                          |
| TC/2026/21            | 6.6.1   | SembCorp Solar Singapore Pte Ltd | Will EMA be defining the grid-forming requirements to ensure that compliance will be consistent across the industry?                                                                                                                                                                                                                                                                                                                                                       | EMA will take into account industry feedback in developing the detailed technical requirements for grid-forming functionality and may issue further technical guidance, where necessary, to support                                                                                                                                                                                                                                                                                                   |

| Modification Ref. No. | Clause  | Public/ Industry                 | Comments                                                                                                                                                                                                                                                                                                                                                                                                             | EMA's Response                                                                                                                                                                                                                                                                                                                                                                                                                                       |
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|                       |         |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                      | consistent implementation across the industry, including expectations on how compliance is to be demonstrated by the connected person.                                                                                                                                                                                                                                                                                                               |
| TC/2026/22            | C4.1    | SembCorp Solar Singapore Pte Ltd | Can EMA define the term “domestic solar PV generation facilities? Does this mean all solar PV installations within Singapore or residential accounts?                                                                                                                                                                                                                                                                | EMA clarifies that “domestic solar PV generation facilities” refers to solar PV generation facilities installed in Singapore and is not limited to residential accounts or premises. EMA will make this definition clearer in the Transmission Code.                                                                                                                                                                                                 |
| TC/2026/23            | F7.1    |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| TC/2026/24            | F8.1    |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| TC/2026/25            | C4.1(i) |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| TC/2026/26            | H1.1    |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| TC/2026/27            | H2.1(b) | SembCorp Solar Singapore Pte Ltd | We would appreciate clarification on whether multiple solar PV systems or MV stations within the same development may share a common RTU. For example, if a 10 MW PV system with one MV station and one RTU is subsequently expanded with an additional 10 MW connected via a second MV station, can both systems be monitored through the same RTU, assuming all monitoring and communication requirements are met? | Multiple solar PV systems within the same point of connection may use a common RTU, on the condition that each RTU does not control more than 4 centrally dispatchable generating units or its total generation capacity is not more than 1000MW. For the avoidance of doubt, the licensee may approach EMA with the facility's single-line diagram to seek clarification on the applicable requirements prior to the commissioning of the facility. |

## Annex 2

### Modifications to the Transmission Code

| Modification Ref. No. | Clause | Original Text                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Modified Text                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Reasons                                                                                                                                                                                             |
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| TC/2026/20            | 4.2.3  | The Transmission Licensee shall forward the proposed connection scheme (where the proposed connection is to the <i>transmission network</i> , or is for the connection of <i>generating unit(s)</i> of rated capacity 1MW and above or solar photovoltaic <i>generating unit(s)</i> of capacity 1MWac and above to the consumer's <i>installation</i> that is connected to the <i>transmission network</i> ) to the <i>Power System Operator</i> . The <i>Power System Operator</i> , upon receiving the proposed connection scheme from the Transmission Licensee:- | The Transmission Licensee shall forward the proposed connection scheme (where the proposed connection is to the <i>transmission network</i> , or is for the connection of <i>generating unit(s)</i> of rated capacity 1MW and above or <u>domestic</u> solar photovoltaic <i>generating unit(s)</i> of <u>aggregated</u> capacity 1MWac and above to the consumer's <i>installation</i> that is connected to the <i>transmission network</i> ) to the <i>Power System Operator</i> . The <i>Power System Operator</i> , upon receiving the proposed connection scheme from the Transmission Licensee:-                                                                     | This amendment clarifies that 1MWac capacity threshold applies to the aggregated capacity of domestic solar PV generating units connected to a consumer's installation on the transmission network. |
| TC/2026/21            | 6.6.1  | 6.6 Reactive Power Requirements<br>6.6.1 The Generation Licensee responsible for each generating unit connected to the transmission system shall ensure that each generating unit has the capability of operating at a power factor from 0.95 leading to 0.85 lagging as measured at the terminals of the generating unit prior to the step-up transformer. For grid-connected solar photovoltaic generating unit(s), the connected person shall ensure that the inverter(s) has the capability of operating at a power factor from 0.9 leading to 0.9 lagging.      | 6.6 Reactive Power Requirements<br>6.6.1 The Generation Licensee responsible for each generating unit connected to the transmission system shall ensure that each generating unit has the capability of operating at a power factor from 0.95 leading to 0.85 lagging as measured at the terminals of the generating unit prior to the step-up transformer. For grid-connected <u>domestic</u> solar photovoltaic generating unit(s), the connected person shall ensure that the <u>photovoltaic generating unit(s)</u> inverter(s) <u>shall be of grid-forming type inverter which</u> has the capability of operating at a power factor from 0.9 leading to 0.9 lagging. | This amendment is to update that each new installed domestic solar PV generating unit shall be installed with a grid-forming type inverter to support the grid.                                     |

| Modification Ref. No. | Clause | Original Text                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Modified Text                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Reasons                                                                                                                                                                                                                                                                                                                                                                         |
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| TC/2026/22            | C4.1   | All <i>generating units</i> of gross generating capacity exceeding 10MW or registered with the Energy Market Company as a <i>generation registered facility</i> shall be centrally dispatched. All centrally dispatchable <i>generating units</i> , shall be designed to have the following capabilities except where the Generation Licensees declare with technical justifications that certain capabilities are technically not possible and submit such request together with its supporting reasons for PSO consideration. | All <i>generating units</i> of gross generating capacity exceeding 10MW or registered with the Energy Market Company as a <i>generation registered facility</i> shall be centrally dispatched. All centrally dispatchable <i>generating units</i> , shall be designed to have the following capabilities except where the Generation Licensees declare with technical justifications that certain capabilities are technically not possible and submit such request together with its supporting reasons for PSO consideration. <u>For domestic solar PV generation facilities<sup>3</sup>, C4.1(a), (c), (d), (e) and (f) are not applicable.</u><br><br><sup>3</sup> <u>“domestic solar PV generation facilities” refers to solar PV generation facilities installed in Singapore and is not limited to residential installations.</u> | This amendment clarifies that sub-clauses C4.1(a), (c), (d), (e) and (f) do not apply to domestic solar PV generation facilities, which are intermittent generation facilities.<br><br>It also clarifies that “domestic solar PV generation facilities” refers to solar PV generation facilities installed in Singapore and is not limited to residential accounts or premises. |
| TC/2026/23            | F7.1   | This section states the minimum spinning reserve requirement in terms of primary reserve for each generating unit which has a Completion Date after 1 January 2000.                                                                                                                                                                                                                                                                                                                                                             | This section states the minimum spinning reserve requirement in terms of primary reserve for each <i>generating unit</i> which has a Completion Date after 1 January 2000, <u>except domestic solar PV generation facilities.</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | This amendment clarifies that the Primary Reserve Requirement does not apply to domestic solar PV generation facilities.<br><br>However, EMA may introduce separate mechanisms where needed.                                                                                                                                                                                    |

| Modification Ref. No. | Clause  | Original Text                                                                                                                                                                                                                                                                                                                                          | Modified Text                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Reasons                                                                                                                                                                                                                    |
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| TC/2026/24            | F8.1    | Each <i>generating unit</i> must be capable of providing minimum primary <i>reserve</i> for both primary and <i>alternate fuel</i> . The Spinning Reserve Requirements for primary and <i>alternate fuel</i> are as follows:                                                                                                                           | Each <i>generating unit</i> , <u>except domestic solar PV generation facilities</u> , must be capable of providing minimum primary <i>reserve</i> for both primary and <i>alternate fuel</i> . The Spinning Reserve Requirements for primary and <i>alternate fuel</i> are as follows:                                                                                                                                                                                                                                                                                                                                                                 | This amendment clarifies that the Spinning Reserve Requirements for Frequency Sensitive Plant do not apply to domestic solar PV generation facilities.<br><br>However, EMA may introduce separate mechanisms where needed. |
| TC/2026/25            | C4.1(i) | (i) Remote Monitoring and Automatic Generation Control<br><br>The Generation Licensee shall make provision at their facility for remote monitoring of the <i>generating units</i> ' output and switchhouse equipment loading and operating conditions etc. as well as automatic control of generation output from <i>Power System Operator's EMS</i> . | (i) Remote Monitoring and Automatic Generation Control<br><br>The Generation Licensee shall make provision at their facility for remote monitoring of the <i>generating units</i> ' output and switchhouse equipment loading and operating conditions etc. as well as automatic control of generation output from <i>Power System Operator's EMS</i> .<br><br><u>Notwithstanding the above, a domestic solar PV generation facility need not provide automatic generation control capabilities but shall still provide Remote Terminal Unit(s) for remote monitoring of their domestic solar PV generating unit's output and operating conditions.</u> | The requirement for Automatic Generation Control shall not be applicable to domestic solar PV generating units.                                                                                                            |

| Modification Ref. No. | Clause   | Original Text                                                                                                                                                                                                                                                                                                                            | Modified Text                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Reasons                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
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| TC/2026/26            | H1.1     | <p>H1.1 All generation facilities and transmission network that are required to interface to the <i>Energy Management System (EMS)</i> of the <i>PSO</i> shall provide several or all of the following functions:</p> <p>(a) SCADA functions</p> <p>(b) Automatic Generation Control (AGC) functions</p>                                 | <p>H1.1 All generation facilities and transmission network that are required to interface to the <i>Energy Management System (EMS)</i> of the <i>PSO</i> shall provide several or all of the following functions:</p> <p>(a) SCADA functions</p> <p>(b) Automatic Generation Control (AGC) functions.</p> <p><u>Notwithstanding the above, a domestic solar PV generation facility need not provide automatic control capabilities but shall still provide SCADA functions for remote monitoring of their domestic solar PV generating unit's output and operating conditions.</u></p> | The requirement for Automatic Generation Control shall not be applicable to domestic solar PV generating units.                                                                                                                                                                                                                                                                                                                                                                                                               |
| TC/2026/27            | H2.1 (b) | (b) A <i>generating station</i> shall have a dedicated <i>RTU</i> with the condition that the <i>RTU</i> shall not be controlling more than 4 <i>generating units</i> or a total of more than 1000MW. Should the number of <i>generating units</i> or total generating capacity exceed this, then a second <i>RTU</i> shall be provided. | (b) A <i>generating station</i> shall have dedicated <i>RTUs</i> with the condition that <del>the</del> <u>each <i>RTU</i></u> shall not be controlling more than 4 <u>centrally dispatchable generating units</u> or total <u>generation capacity of a total of</u> more than 1000MW. <del>Should the number of generating units or total generating capacity exceed this, then a second <i>RTU</i> shall be provided.</del>                                                                                                                                                          | As the requirement for an additional RTU for monitoring are meant for large generating units and if the aggregated generation capacity of (more than 4) distributed energy resources is less than 1000MW, a momentary loss of monitoring of these distributed energy resources will not have a significant impact to power system operations. As such there is no foreseeable need for the licensee to provide an additional RTU for monitoring purposes if they are not more than 4 centrally dispatchable generating units. |

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| TC/2026/28 | H4.2 | <p>Generating station</p> <p>H4.2.1 The status of the following equipment shall be provided:</p> <ul style="list-style-type: none"> <li>(a) <i>Generating unit circuit breakers;</i></li> <li>(b) Local/Remote status;</li> <li>(c) Load limiter status;</li> <li>(d) Status of frequency response switch;</li> <li>(e) Emergency Shutdown Valve (ESDV) and the status of all valves on the Onshore Receiving Facility (ORF) and natural gas transmission pipeline supplying natural gas to the generation facility;</li> <li>(f) Pressure and gas flow at ORF and natural gas transmission pipeline supplying natural gas to the generation facility;</li> <li>(g) For a combined-cycle plant or gas turbine, the ambient temperature and the hot switch activation signal when fuel changeover is initiated, manually or automatically, from natural gas to its alternate fuel and the fuel type used; and</li> <li>(h) Other quantities, as required.</li> </ul> <p>H4.2.2 The following measurements shall be provided:</p> <ul style="list-style-type: none"> <li>(a) MW and MVar of all <i>generating units</i>;</li> <li>(b) Unit terminal voltage of all <i>generating units</i>;</li> <li>(c) High/Low Limits of load limiter;</li> </ul> | <p>Generating station</p> <p>H4.2.1 The status of the following equipment shall be provided:</p> <ul style="list-style-type: none"> <li>(a) <i>Generating unit circuit breakers;</i></li> <li>(b) Local/Remote status;</li> <li>(c) Load limiter status;</li> <li>(d) Status of frequency response switch;</li> <li>(e) Emergency Shutdown Valve (ESDV) and the status of all valves on the Onshore Receiving Facility (ORF) and natural gas transmission pipeline supplying natural gas to the generation facility;</li> <li>(f) Pressure and gas flow at ORF and natural gas transmission pipeline supplying natural gas to the generation facility;</li> <li>(g) For a combined-cycle plant or gas turbine, the ambient temperature and the hot switch activation signal when fuel changeover is initiated, manually or automatically, from natural gas to its alternate fuel and the fuel type used; and</li> <li>(h) Other quantities, as required.</li> </ul> <p>H4.2.2 The following measurements shall be provided:</p> <ul style="list-style-type: none"> <li>(a) MW and MVar of all <i>generating units</i>;</li> <li>(b) Unit terminal voltage of all <i>generating units</i>;</li> <li>(c) High/Low Limits of load limiter;</li> <li>(d) Frequency at <i>generating unit</i> terminal; and</li> </ul> | <p>To exclude the requirements for a generation facility where generation comprise solely domestic solar PV generating units.</p> |
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| Modification Ref. No. | Clause | Original Text                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Modified Text                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Reasons                                                                                    |
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|                       |        | <p>(d) Frequency at <i>generating unit</i> terminal; and</p> <p>(e) Other quantities, as required;</p> <p>H4.2.3 The following remote control facilities shall be provided:</p> <p>(a) <i>Generating unit</i> raise or lower control; and</p> <p>(b) Other equipment, as required;</p>                                                                                                                                                                                                                                                                                                                                                                                                 | <p>(e) Other quantities, as required;</p> <p>H4.2.3 The following remote control facilities shall be provided:</p> <p>(a) <i>Generating unit</i> raise or lower control; and</p> <p>(b) Other equipment, as required;</p> <p><u>Notwithstanding the above, domestic solar PV generation facility need not provide information in Clauses H4.2.1 (b), (c), (d), (e), (f), (g), H4.2.2 (c) and H4.2.3 (a).</u></p>                                                                                                                                                                                                                                                                                                                 |                                                                                            |
| TC/2026/29            | H4.3   | <p>H4.3 Solar Photovoltaic System</p> <p>The following measurements shall be provided:</p> <p>(a) Active Power (gross) at the AC-side of the solar photovoltaic system; and</p> <p>(b) Solar irradiance from sensor installed in close proximity to the PV panels.</p> <p>The solar irradiance sensor shall comply with the following minimum specifications:</p> <ul style="list-style-type: none"> <li>• Irradiance range: 0 – 2000Wm<sup>-2</sup> or better</li> <li>• Accuracy of direct power output: &gt;90% for clear sky</li> <li>• Directional response (for beam irradiance): +/- 20Wm<sup>2</sup></li> <li>• Response time to reach 95% response: &lt;30 seconds</li> </ul> | <p>H4.3 Solar Photovoltaic System</p> <p>The following measurements shall be provided:</p> <p>(a) Active Power (gross) <u>and Reactive Power</u> at the AC-side of the <u>domestic</u> solar photovoltaic system; and</p> <p>(b) Solar irradiance from sensor installed in close proximity to the PV panels.</p> <p>The solar irradiance sensor shall comply with the following minimum specifications:</p> <ul style="list-style-type: none"> <li>• Irradiance range: 0 – 2000Wm<sup>-2</sup> or better</li> <li>• Accuracy of direct power output: &gt;90% for clear sky</li> <li>• Directional response (for beam irradiance): +/- 20Wm<sup>2</sup></li> <li>• Response time to reach 95% response: &lt;30 seconds</li> </ul> | This amendment is to update the monitoring requirements for each domestic solar PV system. |

| Modification Ref. No.                            | Clause                           | Original Text                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Modified Text                                    | Reasons                          |                               |        |     |     |             |     |     |               |     |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                  |                                  |                               |        |     |     |             |     |     |               |     |     |                                                                                |
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| TC/2026/30                                       | F10.1                            | <p>The <i>solar photovoltaic generation facility</i> and <i>ESS</i> shall be capable of disconnecting from the <i>transmission system</i> if under or over voltage is detected at the <i>connected person's</i> incoming switchboard* or at the <i>generating unit</i> terminal. The range of abnormal operating voltages and the corresponding minimum holding time before disconnection and maximum trip time shall be as follows:</p> <table><tr><th>Abnormal Voltage Range<br/>(% of nominal voltage)</th><th>Minimum Holding Time<br/>(second)</th><th>Maximum Trip Time<br/>(second)</th></tr><tr><td>V &lt; 50</td><td>0.6</td><td>1.6</td></tr><tr><td>50 ≤ V &lt; 88</td><td>2.0</td><td>3.0</td></tr><tr><td>110 &lt; V &lt; 120</td><td>1.0</td><td>2.0</td></tr></table> <p>*For large installation (&gt;1MWac) being connected to the HT network solely for the purpose of energy export, the voltage is detected at the <i>connected person's</i> incoming switchboard.</p> | Abnormal Voltage Range<br>(% of nominal voltage) | Minimum Holding Time<br>(second) | Maximum Trip Time<br>(second) | V < 50 | 0.6 | 1.6 | 50 ≤ V < 88 | 2.0 | 3.0 | 110 < V < 120 | 1.0 | 2.0 | <p>The <i>solar photovoltaic generation facility</i> and <i>ESS</i> shall be capable of disconnecting from the <i>transmission system</i> if under or over voltage is detected at the <i>connected person's</i> incoming switchboard* or at the <i>generating unit</i> terminal. The range of abnormal operating voltages and the corresponding minimum holding time before disconnection and maximum trip time shall be as follows:</p> <table><tr><th>Abnormal Voltage Range<br/>(% of nominal voltage)</th><th>Minimum Holding Time<br/>(second)</th><th>Maximum Trip Time<br/>(second)</th></tr><tr><td>V &lt; 50</td><td>0.6</td><td>1.6</td></tr><tr><td>50 ≤ V &lt; 88</td><td>2.0</td><td>3.0</td></tr><tr><td>110 &lt; V &lt; 120</td><td>1.0</td><td>2.0</td></tr></table> <p><del>*For large installation (&gt;1MWac) being connected to the HT network solely for the purpose of energy export, the voltage is detected at the <i>connected person's</i> incoming switchboard.</del></p> | Abnormal Voltage Range<br>(% of nominal voltage) | Minimum Holding Time<br>(second) | Maximum Trip Time<br>(second) | V < 50 | 0.6 | 1.6 | 50 ≤ V < 88 | 2.0 | 3.0 | 110 < V < 120 | 1.0 | 2.0 | This amendment is to clarify that the requirement shall apply to all solar PV. |
| Abnormal Voltage Range<br>(% of nominal voltage) | Minimum Holding Time<br>(second) | Maximum Trip Time<br>(second)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                  |                                  |                               |        |     |     |             |     |     |               |     |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                  |                                  |                               |        |     |     |             |     |     |               |     |     |                                                                                |
| V < 50                                           | 0.6                              | 1.6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                  |                                  |                               |        |     |     |             |     |     |               |     |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                  |                                  |                               |        |     |     |             |     |     |               |     |     |                                                                                |
| 50 ≤ V < 88                                      | 2.0                              | 3.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                  |                                  |                               |        |     |     |             |     |     |               |     |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                  |                                  |                               |        |     |     |             |     |     |               |     |     |                                                                                |
| 110 < V < 120                                    | 1.0                              | 2.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                  |                                  |                               |        |     |     |             |     |     |               |     |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                  |                                  |                               |        |     |     |             |     |     |               |     |     |                                                                                |
| Abnormal Voltage Range<br>(% of nominal voltage) | Minimum Holding Time<br>(second) | Maximum Trip Time<br>(second)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                  |                                  |                               |        |     |     |             |     |     |               |     |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                  |                                  |                               |        |     |     |             |     |     |               |     |     |                                                                                |
| V < 50                                           | 0.6                              | 1.6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                  |                                  |                               |        |     |     |             |     |     |               |     |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                  |                                  |                               |        |     |     |             |     |     |               |     |     |                                                                                |
| 50 ≤ V < 88                                      | 2.0                              | 3.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                  |                                  |                               |        |     |     |             |     |     |               |     |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                  |                                  |                               |        |     |     |             |     |     |               |     |     |                                                                                |
| 110 < V < 120                                    | 1.0                              | 2.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                  |                                  |                               |        |     |     |             |     |     |               |     |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                  |                                  |                               |        |     |     |             |     |     |               |     |     |                                                                                |