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| *FACILITY X:* *Generator Monitoring plan* |
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| --- | --- |
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| VERSION: | 1.0 |
| EFFECTIVE DATE: | 28 June 2021 |
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|  |  |

Important notice

PURPOSE

AEMO publishes this Generator Monitoring Plan form to assist Market Participants in developing a proposed Generator Monitoring Plan. Market Participants must submit Generator Monitoring Plans that are consistent with the format presented in this Generator Monitoring Plan form, in accordance with WEM Procedure: Generator Monitoring Plans, to AEMO. The *Electricity Industry Act 2004*, the WEM Regulations, the WEM Rules and WEM Procedures prevail over this form to the extent of any inconsistency.

Disclaimer

This document might also contain information which is provided for explanatory purposes. That information does not constitute legal or business advice, and should not be relied on as a substitute for obtaining detailed advice about the Law, the Rules, or any other applicable laws, procedures or policies. AEMO has made every effort to ensure the quality of the information but cannot guarantee its accuracy or completeness.

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User guide

1. The red texts in this form are explanatory notes to assist Market Participants in providing required information and they are to be deleted prior to submission of a proposed Generator Monitoring Plan, by a Market Participant to AEMO.
2. The *italicised* texts are examples. They are to be modified prior to submission of a proposed Generator Monitoring Plan, by a Market Participant to AEMO.

Version Release History

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| --- | --- | --- |
| Version  | Effective Date | Summary of Changes |
| 1.0 | 28 June 2021 | First publication of the Generator Monitoring Plan form |

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| --- | --- |
| Item | Description |
| Market Participant Name | [Enter according to WEM registration. Compulsory, for the purpose of verification]  |
| Market Participant Code | [Enter according to WEM registration. Compulsory, for the purpose of verification]  |
| Facility Code | [Enter according to WEM registration. Compulsory, for the purpose of verification] |
| Facility’s Registered Generator Performance Standard date | [Enter as the latest date of Registered Generator Performance Standards from all Generating Systems within the Facility. Compulsory, for the purpose of verification] |
| Contact Name | [Name/Position. Compulsory, for AEMO to contact relevant personnel of a Market Participant] |
| Address/Phone/Fax | [Address/Phone/Fax. Compulsory, for AEMO to contact relevant personnel of a Market Participant] |
| Author | [Name/Position. Optional, to be entered for Market Participant’s record keeping.] |
| Reviewed By | [Name/Position. Optional, to be entered for Market Participant’s record keeping.] |
| Approved By | [Name/Position. Optional, to be entered for Market Participant’s record keeping.] |

Version Release History

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| 1.0 | [dd Month yyyy] | [Enter relevant changes. Compulsory, for the purpose of AEMO’s assessment.] *First submission to AEMO* |

Review STATUS

|  |  |
| --- | --- |
| Review date | Date |
| Next review date | [dd Month yyyy][Compulsory, for the purpose of AEMO’s assessment.] |
| Historical review #1 | [dd Month yyyy][Compulsory, for the purpose of AEMO’s assessment.] |

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# Introduction

## Facility X

[Include an introduction/summary of the Facility with the Generating System to assist AEMO in understanding this Generator Monitoring Plan.]

### Facility X – Generating System A

[Brief introduction/summary of a Generating System and its Generating Units covered in a single GPS]

1. Example of a brief introduction/summary for a gas/steam turbine Generating System

|  |  |
| --- | --- |
| Item | Description |
| *Generating Unit names associated with the GPS of the Generating System A*  | [As provided in the GPS Submission Template] |
| *Date of Registered GPS of the Generating System A* | [As provided in the AEMO MPI portal] |
| *Excitation system make and model* |  |
| *Turbine make and model* |  |
| *Governor make and model* |  |
| *Rated MVA* |  |
| *Rated MW* |  |
| *Rated Power Factor* |  |
| *Nominal voltage (kV)* |  |
| *Rated stator current (kA)* |  |
| *Rated field current (A)* |  |
| *Rated Hz* |  |
| *Rated filed voltage (VDC)* |  |
| *Ceiling factor* |  |
| *Include others as appropriate* |  |

### Facility X – Generating System B

[Brief introduction/summary of other Generating System and its Generating Units within the Facility covered in a separate GPS, if applicable.]

1. Example of a brief introduction/summary for an asynchronous Generating System

|  |  |
| --- | --- |
| Item | Description |
| *Generating Unit names associated with the GPS of the Generating System B* | [As provided in the GPS Submission Template] |
| *Date of Registered GPS of the Generating System A* | [As provided in the AEMO MPI portal] |
| *Generating Units make(s) and model(s)* |  |
| *Number of Wind Turbine Generators/Inverters* |  |
| *Power Plant Controller make and model* |  |
| *Rated MVA*  |  |
| *Rated MW*  |  |
| *Rated Power Factor*  |  |
| *Nominal voltage (kV)*  |  |
| *Rated current*  |  |
| *Include others as appropriate* |  |

### Facility X – Other equipment

[Brief introduction/summary of other equipment within the Facility that are part of the applicable Registered Generating Performance Standards, e.g. harmonic filters, static and dynamic reactive power device, special protection schemes.]

## Roles and responsibilities/Site test coordination

[Roles and responsibilities may be included for internal releases and record keeping, especially in the case that a Generator Monitoring Plan is prepared by an external consulting engineer.]

 *All personnel involved in preparing, maintaining, executing and approving this Generator Monitoring Plan are summarised in Table 3.*

*In addition, The Generator Monitoring Plan, including any outcome of the testing and verification, must be distributed internally according to the following distribution list for review and comments, prior to submission to AEMO:*

* 1. *Facility X Compliance Team;*
	2. *Facility X Operations Team; and*
	3. *Facility X Asset Maintenance Team.*
1. Example of roles and responsibilities for execution of Compliance Monitoring Plan

|  |  |  |
| --- | --- | --- |
| **Role** | **Contact** | **Responsibility** |
| *Facility X Operations Manager* |  |  |
| *Facility X Coordinator* |  |  |
| *Facility X Lead Engineer* |  |  |
| *Consulting Engineer (Generator Monitoring Plan)* |  |  |
| *Consulting Engineer (Testing and Verification)* |  |  |
| *Network Operator* |  |  |
| *AEMO* |  |  |

## Non-compliance

[Include details of any non-compliance and suspected non-compliance, rectification and status of compliance at the time of submission of this Generator Monitoring Plan, and if applicable, the test results following a request by AEMO to undertake a test in accordance with section 7.1.9 and 7.1.10 of the WEM Procedure: Generator Monitoring Plans.

*There has been no non-compliance identified and/or self-reported by Facility X against any of the Registered GPS to date.*

*There has been no non-compliance reported or advised by AEMO and/or established by ERA at the time of submission of this Generator Monitoring Plan.*

## Requests for information

[Include any relevant information requests by AEMO in accordance with section 2.3.1(g), 7.1.12 and 7.1.13 of the WEM Procedure: Generator Monitoring Plans. Detail where and how the Information has been provided in this Generator Monitoring Plans or other communications, including the form, format and manner.]

*AEMO has not requested any information under section 2.3.1(g), 7.1.12 or 7.1.13 of the WEM Procedure: Generator Monitoring Plans.*

## Commencement date

[Include proposed commencement date for this Generator Monitoring Plan.]

*This Generator Monitoring Plan approved by AEMO, takes effect from 1st August 2021, until another approved Generator Monitoring Plan supersedes it.*

## Proposed timeframe for evidence of compliance

[Include proposed timeframe for submission of the first complete set of evidence of compliance, as well as the subsequent sets of evidence of compliance. Evidence of compliance is described in WEM Procedure: Generator Monitoring Plans].

*The first complete set of evidence of compliance is scheduled to be submitted by Facility X to AEMO prior to 1st February 2022, i.e. within 6 months after the commencement date specified in Section 1.5* *of this form.*

*The subsequent evidence of compliance will be submitted according to the proposed frequency of testing specified in each section from Section 2 to Section 0 of this form.*

## Non-compliance reporting

[Include any internal processes for a Facility to report any identified non-compliance for that Facility. Note that the process to self-report any non-compliance to AEMO is specified in the WEM Rules and WEM Procedure: Generator Monitoring Plans.]

*Where non-compliance has been identified at any time for any of the Technical Requirements described in Appendix 12 of the WEM Rules, compliance team must notify Operations Manager according to internal non-compliance notification process, refer to Internal Instructions xxx.*

## Review of Generator Monitoring Plan

[Include audit or review process for Generator Monitoring Plan]

*The Generator Monitoring Plan must be independently audited by an external party engaged by Facility X, every 5 years for compliance with:*

* *Chapter 3A of WEM Rules;*
* *Appendix 12 of WEM Rules, and*
* *WEM Procedure: Generator Monitoring Plans.*

## Glossary

[Include any terms and abbreviations necessary to assist AEMO in understanding of this Generator Monitoring Plan.]

1. Terms and abbreviations used in this Generator Monitoring Plan

|  |  |
| --- | --- |
| **Term** | **Definition** |
| *Evidence of compliance* | *It has the meaning described in WEM Procedure: Generator Monitoring Plans.* |
| *Monitoring Results or Monitoring Data* | *It has the meaning described in WEM Procedure: Generator Monitoring Plans.* |
| *Test Results or Test Data* | *It has the meaning described in WEM Procedure: Generator Monitoring Plans.* |
| *Disturbance Data* | *It has the meaning described in WEM Procedure: Generator Monitoring Plans.* |
| *CUO* | *Continuous Uninterrupted Operation* |
| *Registered GPS* | *Registered Generator Performance Standard* |

# Active Power Capability

## Testing and monitoring

[Include details of testing and monitoring for each Generating Systems within Facility X, considering the principles and information required by WEM Procedure: Generator Monitoring Plans in order for AEMO to understand, assess and approve this Generator Monitoring Plan.]

### *Generating System A*

[This is an example of the testing method.]

*The test is to be undertaken during summer from December to March, and during the hottest time of the day so that Rated Maximum Active Power output level can be verified at the required maximum ambient temperature of 45 degrees, as specified by the Network Operator.*

*The record of ambient temperature is available locally outside the protection relay room of Facility X.*

*Approval for testing from the Network Operator and AEMO must be obtained prior to the test being undertaken.*

*The following steps provide a high-level view of how the test is to be undertaken:*

1. *Record the ambient temperature at the time of test;*
2. *Ensure generator MW output, gas pressure and generator speed are being recorded for diagnosis purposes;*
3. *Adjust the MW level to Rated Minimum Active Power output level and sustain for at least 5 minutes;*
4. *Stop and save recording, review the test results to confirm if the test needs to be repeated;*
5. *Repeat the test by adjusting MW level to 25%, 50%, 75% of Rated Maximum Active Power output level, and to Rated Maximum Active Power output;*

*Detailed steps are described in the attached document ‘Test Plan Facility X’. Test Plan Facility X complete with timestamps where the tests have been performed and signatures by those who have performed and witnessed, will be submitted as part of evidence of compliance*

### *Generating System B*

[This is a different example of the testing method description.]

*Test equipment described in Section 2.2 of this form is used to monitor the Active Power level continuously at 30-minute intervals at the Connection Point located at substation ABC 132 kV. The ambient temperature and relevant operating condition quantities listed as follows are recorded continuously as part of monitoring and logging system of the governor Control System.*

*The Monitoring Data is scheduled to be assessed annually after 31st March. The results will be compiled and circulated for comments internally according to distribution list described in Section 1.2. All results will be compiled and submitted as evidence of compliance to AEMO at the proposed timeframe for evidence of compliance as described in Section 1.6 of this form.*

*There are no power backup or UPS system installed for the monitoring equipment. In the event of the equipment being out of service and gaps are found in the Monitoring Data, Facility X will request network SCADA data from the Network Operator to complete the Monitoring Data.*

## Recording or measuring device

[Include details of relevant recording or measuring device for each Generating Systems within Facility X, including demonstration of their compliance with requirements in Attachment 11 of the Technical Rules, their appropriateness of the measuring device (accuracy, resolution and reliability) for this specific test (refer to WEM Procedure: Generator Monitoring Plans for requirements for recording or measuring device).]

### *Generating System A*

[This is an example of the testing equipment description.]

*The test equipment for Active Power on-site online tests will be as supplied by Consulting Engineer (testing and verification) at the time of site testing. Consulting Engineer must as part of their contract provide specifications and calibration test certificates at least 5 days prior to the site-test proposed in Section 2.1.1 of this form to Facility X, to support demonstration of compliance of the test equipment with relevant requirements in Attachment 11 of the Technical Rules. These specifications and calibration test certificates will be supplied upon submission of evidence of compliance.*

1. Compliance withrequirements in Attachment 11 of the Technical Rules – Generating System A

|  |  |  |
| --- | --- | --- |
| **Description** | **Technical requirement** | **Device specification** |
| *Calibration* |  |  |
| *Analogue to digital to conversion at full screen* |  |  |
| *Sample rate* |  |  |
| *Departure from linearity* |  |  |
| *DC offset error* |  |  |
| *Bandwidth – Voltage* |  |  |
| *Bandwidth – Current* |  |  |

### *Generating System B*

[This is different example of the testing equipment description.]

*The test equipment for continuous monitoring in method 2 is LEGEND model A459, which is compliant with requirements in Attachment 11 of the Technical Rules, as demonstrated in Table 6. LEGEND model A459 specifications and calibration test certificates are attached.*

1. Compliance withrequirements in Attachment 11 of the Technical Rules – Generating System B

|  |  |  |
| --- | --- | --- |
| **Description** | **Technical requirement** | **LEGEND A459 specification** |
| *Calibration* |  |  |
| *Analogue to digital to conversion at full screen* |  |  |
| *Sample rate* |  |  |
| *Departure from linearity* |  |  |
| *DC offset error* |  |  |
| *Bandwidth – Voltage* |  |  |
| *Bandwidth – Current* |  |  |

## Compliance verification

[Proposed verification mechanisms are suggestions described in Appendix D of the WEM Procedure: Generator Monitoring Plans. Market Participants may propose any other suitable ongoing verification mechanisms. Market Participants are to include details of the applicable Registered Generator Performance Standards and evidence of compliance.]

1. Ongoing compliance verification of Active Power capability and evidence of compliance for Generating System A

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Criteria description** | **Appendix 12 clauses** | **Statement of compliance – Generating System A** | **Verification of compliance – Generating System A** | **Evidence of compliance – Generating System A** |
| Specified network location for this Technical Requirement | A12.2.2.1, A12.2.3.1 |  | *Demonstration that monitoring for tests undertaken to verify the requirements under A12.2 of the WEM Rules have been performed at the required location.* |  |
| Temperature Dependency Data | A12.2.2.1, A12.2.3.2 |  | *Active Power capability vs ambient temperature from Test Data and Monitoring Data is consistent with the Temperature Dependency Data.* |  |
| Maximum ambient temperature assessment | A12.2.2.1, A12.2.3.3 |  | *Active Power capability vs maximum ambient temperature specified by the Network Operator, from Test Data and Monitoring Data, is consistent with the Temperature Dependency Data.* |  |
| Rated Maximum Active Power | A12.2.2.1, A12.2.3.4 |  | *Test Data and Monitoring Data demonstrate that the Generating System is capable of achieving Rated Maximum Active Power output level and maintaining it under all operating conditions, subject to energy source availability.* |  |
| Temporary Active Power reduction | A12.2.2.1, A12.2.3.5 |  | *Specifying and outlining the agreement as per the Registered GPS to allow for temporary reduction in Active Power.* |  |

1. Ongoing compliance verification of Active Power capability and evidence of compliance for Generating System B

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Criteria description** | **Appendix 12 clauses** | **Statement of compliance – Generating System B** | **Verification of compliance – Generating System B** | **Evidence of compliance – Generating System B** |
| Specified network location for this Technical Requirement | A12.2.2.1, A12.2.3.1 |  | *Demonstration that monitoring for tests undertaken to verify the requirements under A12.2 of the WEM Rules have been performed at the required location.* |  |
| Temperature Dependency Data | A12.2.2.1, A12.2.3.2 |  | *Active Power capability vs ambient temperature from Test Data and Monitoring Data is consistent with the Temperature Dependency Data.* |  |
| Maximum ambient temperature assessment | A12.2.2.1, A12.2.3.3 |  | *Active Power capability vs maximum ambient temperature specified by the Network Operator, from Test Data and Monitoring Data, is consistent with the Temperature Dependency Data.* |  |
| Rated Maximum Active Power | A12.2.2.1, A12.2.3.4 |  | *Test Data and Monitoring Data demonstrate that the Generating System is capable of achieving Rated Maximum Active Power output level and maintaining it under all operating conditions, subject to energy source availability.* |  |
| Temporary Active Power reduction | A12.2.2.1, A12.2.3.5 |  | *Specifying and outlining the agreement as per the Registered GPS to allow for temporary reduction in Active Power.* |  |

## Frequency of testing

[Include frequency of testing for each method and each Generating Systems within Facility X.]

### *Generating System A*

[This is an example of the testing method.]

*The online test described in Section 2.1.1 of this form is to be taken every 3 years but may be taken more frequently or more than once within the 3 years, if the required temperature is reached.*

*If there is sufficient evidence from the ongoing monitoring described in Section 2.1.2 of this form (method 2) to conclusively establish that the Technical Requirement has been met, this test may not be necessary.*

### *Generating System B*

[This is a different example of the testing method.]

*Continuously.*

## Risks and mitigation

[Include all risks identified and mitigation for each risk identified for all Generating Systems within Facility X.]

1. Risks and mitigation

|  |  |  |
| --- | --- | --- |
| **Risk** | **Relevant Generating System** | **Mitigation** |
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# Reactive Power Capability

## Testing and monitoring

[Include details of testing and monitoring for each Generating Systems within Facility X, considering the principles and information required by WEM Procedure: Generator Monitoring Plans in order for AEMO to understand, assess and approve this Generator Monitoring Plan.]

## Recording or measuring device

[Include details of relevant recording or measuring device for each Generating Systems within Facility X, including demonstration of their compliance with requirements in Attachment 11 of Technical Rules, their appropriateness of the measuring device (accuracy, resolution and reliability) for this specific test (refer to WEM Procedure: Generator Monitoring Plans for requirements for recording or measuring device). Please duplicate the table for each Generating System as per example from section 2.2 of this form.]

1. Compliance withrequirements in Attachment 11 of the Technical Rules – Generating System A

|  |  |  |
| --- | --- | --- |
| **Description** | **Technical requirement** | **Device specification** |
| *Calibration* |  |  |
| *Analogue to digital to conversion at full screen* |  |  |
| *Sample rate* |  |  |
| *Departure from linearity* |  |  |
| *DC offset error* |  |  |
| *Bandwidth – Voltage* |  |  |
| *Bandwidth – Current* |  |  |

## Compliance verification

[Proposed verification mechanisms are suggestions described in Appendix D of the WEM Procedure: Generator Monitoring Plans. Market Participants may propose any other suitable ongoing verification mechanisms. Market Participants are to include details of the applicable Registered Generator Performance Standards and evidence of compliance. Please duplicate the table for each Generating System as per example from section 2.3.of this form]

1. Ongoing compliance verification of Reactive Power capability and evidence of compliance – Generating System A

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Criteria description** | **Appendix 12 clauses** | **Statement of compliance – Generating System A** | **Verification of compliance – Generating System A** | **Evidence of compliance – Generating System A** |
| Specified network location for this Technical Requirement | A12.3.1.1 |  | *Demonstration that monitoring for tests undertaken to verify the requirements under A12.3 of the WEM Rules have been performed at the required location.* |  |
| Generator Capability Chart | A12.3.1.2 |  | *The required Reactive Power output levels achieved at all operating Active Power output levels are consistent with those in the Generator Capability Chart, considering the range of ambient temperatures recorded during the tests.* |  |
| No limitations to Reactive Power within defined capability | A12.3.1.3 |  | *Demonstration that all Reactive Power output levels are achieved at all operating Active Power output levels within the Generator Capability Chart without any control system limitation, protection system or other limiting device in operation.* |  |
| Maximum ambient temperature assessment | A12.3.1.4 |  | *Monitoring Data demonstrates the required Reactive Power Capability up to the maximum ambient temperature specified in the Registered GPS.* |  |
| Capability to dispatch Active Power and Reactive Power | A12.3.1.5 |  | *Test Data and/or Monitoring Data show the Generating System’s Connection Point permits the Dispatch of the full Active Power and Reactive Power Capability of the Generating System and is consistent with the Generator Capability Chart.* |  |
| Reactive Power Capability | A12.3.2.1, A12.3.3.1 |  | *Test Data and/or Monitoring Data show required Reactive Power output level is successfully achieved at all operating Active Power output levels in both supply and absorb regions, consistent with the Generator Capability Chart.* |  |
| Continuous Reactive Power Capability | A12.3.2.2, A12.3.3.2 |  | *Monitoring Data show Reactive Power output level can be delivered continuously for voltages at the Connection Point within the allowable steady state voltage range as specified in the Registered GPS.*  |  |
| Agreement to reduce Active Power if ambient temperature > 25 degrees |  A12.3.3.3 |  | *Where Active Power level is reduced as per the Registered GPS, ambient temperature must be above 25 degrees at the Generating System’s location.* |  |

## Frequency of testing

[Include frequency of testing for each test and monitoring period for each monitoring for each Generating System within Facility X.]

## Risks and mitigation

[Include all risks identified and mitigation for each risk identified for each Generating System within Facility X.]

1. Risks and mitigation

|  |  |  |
| --- | --- | --- |
| **Risk** | **Relevant Generating System** | **Mitigation** |
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# Voltage and Reactive Power Control

## Testing and monitoring

[Include details of testing and monitoring for each Generating System within Facility X, considering the principles and information required by WEM Procedure: Generator Monitoring Plans in order for AEMO to understand, assess and approve this Generator Monitoring Plan.]

## Recording or measuring device

[Include details of relevant recording or measuring device for each Generating System within Facility X, including demonstration of their compliance with requirements in Attachment 11 of Technical Rules, their appropriateness of the measuring device (accuracy, resolution and reliability) for this specific test (refer to WEM Procedure: Generator Monitoring Plans for requirements for recording or measuring device). Please duplicate the table for each Generating System as per example from section 2.2of this form]

1. Compliance withrequirements in Attachment 11 of the Technical Rules – Generating System A

|  |  |  |
| --- | --- | --- |
| **Description** | **Technical Requirement** | **Device Specification** |
| *Calibration* |  |  |
| *Analogue to digital to conversion at full screen* |  |  |
| *Sample rate* |  |  |
| *Departure from linearity* |  |  |
| *DC offset error* |  |  |
| *Bandwidth – Voltage* |  |  |
| *Bandwidth – Current* |  |  |

## Compliance verification

[Proposed verification mechanisms are suggestions described in Appendix D of the WEM Procedure: Generator Monitoring Plans. Market Participants may propose any other suitable ongoing verification mechanisms. Market Participants are to include details of the applicable Registered Generator Performance Standards and evidence of compliance. Please duplicate the table for each Generating System as per example from section 2.3of this form.]

1. Ongoing compliance verification of voltage and Reactive Power control and evidence of compliance – Generating System A

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Criteria description** | **Appendix 12 clauses** | **Statement of compliance – Generating System A** | **Verification of compliance – Generating System A** | **Evidence of compliance – Generating System A** |
| Power system oscillations damping adequacy | A12.4.2.2(a), A12.4.3.2(a) |  | *Test Data and/or Disturbance Data show all post-step and post-disturbance responses are Adequately Damped, thereby confirming that the Equipment capabilities and Control Systems are sufficient to ensure power system oscillations are Adequately Damped.* |  |
| No degradation of damping performance of power system | A12.4.2.2(b), A12.4.3.2(b) |  | *Test Data and/or Disturbance Data show all post-step and post-disturbance responses of the power system are Adequately Damped, thereby confirming that the Generating System does not degrade the damping of any critical mode of oscillation of the power system.* |  |
| Power system stability requirement | A12.4.2.2(c) |  | *Monitoring Data and/or Disturbance Data show continual stable responses from the Generating System, its Equipment and Control Systems.*  |  |
| Control System testing equipment requirements | A12.4.2.3, A12.4.3.2(c) |  | *Test Data and/or Disturbance Data show all required quantities are monitored and recorded continuously.* |  |
| Ability to operate in all control modes | A12.4.2.4(a), A12.4.3.3 |  | *Test Data show that the Generating System can operate in all control modes specified in the Registered GPS.*  |  |
| Ability to switch between control modes | A12.4.2.4(b) |  | *Test Data show that the Generating System can switch between all control modes specified in the Registered GPS and the switch between control modes is demonstrated to the reasonable satisfaction of the Network Operator and AEMO.* |  |
| Voltage Control System - control accuracy of voltage | A12.4.2.5(a), A12.4.3.4(a) |  | *All step Test Data and Monitoring Data show the voltage is controlled to within 0.5% of the setpoint, where the setpoint is adjusted as specified in the Registered GPS.* |  |
| Voltage Control System - support network voltage during fault | A12.4.2.5(b) |  | *Disturbance Data confirm that the Generating System’s voltage Control System is regulating voltage in a manner that helps to support network voltages during fault and assists the requirements for voltage performance and stability in the Technical Rules.* |  |
| Voltage Control System - continuous controllability | A12.4.2.5(c), A12.4.3.4(b) |  | *Test Data and Monitoring Data show the voltage is continuously controllable in the range specified in the Registered GPS at the Connection Point without reliance on the Tap-Changing Transformer and subject to the Generator Performance Standards for Reactive Power Capability with the voltage control location as specified in the Registered GPS. Record of transformer tap positions are provided for confirmation.*  |  |
| Voltage Control System - limiting devices | A12.4.2.5(d) |  | *Confirmation that the relevant limiting devices exist and is in service; and**Test Data demonstrate proper operation of all relevant limiters in service.* |  |
| Power System Stabiliser control structure and testing requirements | A12.4.2.6 |  | *Provision of block diagrams of the Generating Unit’s power system stabiliser, and the block diagram demonstrates that the power system stabiliser meets the specified requirements.* |  |
| Reactive Power Control System - regulation location and accuracy | A12.4.2.7(a), A12.4.3.5(a)  |  | *Reactive Power and Power Factor step change Test Data show the Reactive Power is controlled to the level of the accuracy levels specified.* |  |
| Reactive Power Control System - continuous controllability of setpoint | A12.4.2.7(b), A12.4.3.5(b)  |  | *Reactive Power and Power Factor step change Test Data show the Reactive Power and Power Factor can be continuously controlled within specified Reactive Power Capability range at the specified location.* |  |
| Control structure and settings approval | A12.4.2.8 |  | *Confirmation that structure and parameter settings of all components of the Control System in the Registered GPS are applicable and valid.* |  |
| Control System damping adequacy | A12.4.2.9 |  | *Test Data shows all post-step and post-disturbance responses are Adequately Damped.* |  |
| Excitation Control System - operation at 105% of nominal voltage | A12.4.2.10(a) |  | *Test Data show that the voltage at the stator of the Generating Unit can be sustained at 105% of nominal voltage continuously at Rated Maximum Active Power output.* |  |
| Excitation Control System - excitation ceiling voltage | A12.4.2.10(b), A12.4.3.6(a) |  | *Test Data show the excitation ceiling voltage can be achieved at the specified levels.* |  |
| Excitation Control System - Power System Stabilizer frequency | A12.4.2.10(c) |  | *Provision of block diagrams of the Generating System power system stabiliser; and**Test Data show the stabilising circuit is responsive and adjustable over a specified frequency range.* |  |
| Excitation Control System - minimum equivalent gain | A12.4.2.10(d), A12.4.2.14 |  | *Provision of Excitation Control System settings show the minimum equivalent gain of 200.* |  |
| Power System Stabiliser measurement requirements | A12.4.2.12(a) |  | *Provision of block diagrams of the Generating Unit’s power system stabiliser, and the block diagram demonstrates that the power system stabiliser meets the specified requirements.* |  |
| Power System Stabiliser limiter requirements | A12.4.2.12(b) |  | *Test Data show that the power system stabiliser has an output limiter continuously adjustable over specified range.*  |  |
| Power oscillation damping capability | A12.4.2.13 |  | *Test Data and/or Disturbance Data show all post-step and post-disturbance responses demonstrate power oscillation damping capability and:*1. *confirmation that the Generating System power system stabiliser is responsive and adjustable over frequency range from 0.1 Hz and 2.5 Hz; and*
2. *provision of block diagrams of the Generating Unit’s power system stabiliser demonstrating it has power system frequency and Active Power output of the Generating Unit as inputs.*
 |  |
| Rise Time | A12.4.2.11, A12.4.2.15 |  | *Test Data demonstrate Rise Time in all required step change tests to be within limits specified in the Registered GPS.*  |  |
| Settling Time  | A12.4.2.11, A12.4.2.15, A12.4.3.6(b), A12.4.3.7 |  | *Test Data demonstrate Settling Time in all required step change tests to be within limits specified in the Registered GPS.* |  |
| Settling Time (with control output saturation) | A12.4.2.11, A12.4.2.15 |  | *Test Data demonstrate Settling Time in all required step change tests with hitting the controlled output limit to be within limits specified in the* Registered GPS*.* |  |
| Agreed controlled parameters to meet performance | A12.4.2.16 |  | *Confirmation that the controlled parameters agreed with the Network Operator and AEMO and are applicable and valid.* |  |
| Reactive Power Control System - limiting devices requirements | A12.4.3.5(c)  |  | *Disturbance Data and investigation of every disconnection show that limiting devices of Reactive Power and Power Factor Control System do not cause Generating Unit to trip at the limits of operating capability, the Generating System can work indefinitely under the control of any limiter and the limiters comply with specified performance.*  |  |
| Highest level a Generating System can reasonably achieve | A12.4.4.1 |  | *N/A.* |  |

## Frequency of testing

[Include frequency of testing for each method for each Generating System within Facility X.]

## Risks and mitigation

[Include all risks identified and mitigation for each risk identified for each Generating System within Facility X.]

1. Risks and mitigation

|  |  |  |
| --- | --- | --- |
| **Risk** | **Relevant Generating System** | **Mitigation** |
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# Active Power Control

## Testing and monitoring

[Include details of testing and monitoring for each Generating System within Facility X, considering the principles and information required by WEM Procedure: Generator Monitoring Plans in order for AEMO to understand, assess and approve this Generator Monitoring Plan.]

## Recording or measuring device

[Include details of relevant recording or measuring device for each Generating System within Facility X, including demonstration of their compliance with requirements in Attachment 11 of Technical Rules, their appropriateness of the measuring device (accuracy, resolution and reliability) for this specific test (refer to WEM Procedure: Generator Monitoring Plans for requirements for recording or measuring device). Please duplicate the table for each Generating System as per example from section 2.2of this form]

1. Compliance withrequirements in Attachment 11 of the Technical Rules – Generating System A

|  |  |  |
| --- | --- | --- |
| **Description** | **Technical requirement** | **Device specification** |
| *Calibration* |  |  |
| *Analogue to digital to conversion at full screen* |  |  |
| *Sample rate* |  |  |
| *Departure from linearity* |  |  |
| *DC offset error* |  |  |
| *Bandwidth – Voltage* |  |  |
| *Bandwidth – Current* |  |  |

## Compliance verification

[Proposed verification mechanisms are suggestions described in Appendix D of the WEM Procedure: Generator Monitoring Plans. Market Participants may propose any other suitable ongoing verification mechanisms. Market Participants are to include details of the applicable Registered Generator Performance Standards and evidence of compliance. Please duplicate the table for each Generating System as per example from section 2.3of this form.]

1. Ongoing compliance verification of Active Power control and evidence of compliance – Generating System A

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Criteria description** | **Appendix 12 clauses** | **Statement of compliance – Generating System A** | **Verification of compliance – Generating System A** | **Evidence of compliance – Generating System A** |
| Compliance with Dispatch Systems Requirements | A12.5.1.1 |  | *All relevant requirements in Dispatch Systems Requirements are listed and evidence of compliance is provided.* |  |
| Arrangement for Access to limit Active Power output | A12.5.1.2 |  | *Confirmation of any arrangements put in place in the Registered GPS is applicable and valid.* |  |
| Control System damping adequacy | A12.5.1.3 |  | *Test Data and/or Monitoring Data show that post-step Active Power is Adequately Damped, at different pre-step or pre-disturbance Active Power levels.* |  |
| Provision of disconnection settings | A12.5.1.4 |  | *Provision of all applicable disconnection settings.* |  |
| Maintaining Active Power output | A12.5.1.5 |  | *Test Data and/or Monitoring Data showing sustained Active Power level despite loss of communications, or failure of Remote Monitoring Equipment or Remote Control Equipment; and**Monitoring Data showing Active Power change is not due to loss of communications, or failure of Remote Monitoring Equipment or Remote Control Equipment.* |  |
| Active Power Control System capability | A12.5.2.1, A12.5.3.1 |  | *Monitoring Data show Active Power Control System follows the specified performance.* |  |
| Rate of change of Active Power | A12.5.2.2, A12.5.3.2 |  | *Test Data and/or Monitoring Data show rate of change of Active Power is continuously within the limit specified in the Registered GPS.* |  |

## Frequency of testing

[Include frequency of testing for each method for each Generating System within Facility X.]

## Risks and mitigation

[Include all risks identified and mitigation for each risk identified for each Generating System within Facility X.]

1. Risks and mitigation

|  |  |  |
| --- | --- | --- |
| **Risk** | **Relevant Generating System** | **Mitigation** |
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# Inertia and Frequency Control

## Testing and monitoring

[Include details of testing and monitoring for each Generating System within Facility X, considering the principles and information required by WEM Procedure: Generator Monitoring Plans in order for AEMO to understand, assess and approve this Generator Monitoring Plan.]

## Recording or measuring device

[Include details of relevant recording or measuring device for each Generating System within Facility X, including demonstration of their compliance with requirements in Attachment 11 of Technical Rules, their appropriateness of the measuring device (accuracy, resolution and reliability) for this specific test (refer to WEM Procedure: Generator Monitoring Plans for requirements for recording or measuring device). Please duplicate the table for each Generating System as per example from section 2.2of this form]

1. Compliance withrequirements in Attachment 11 of the Technical Rules – Generating System A

|  |  |  |
| --- | --- | --- |
| **Description** | **Technical requirement** | **Device specification** |
| *Calibration* |  |  |
| *Analogue to digital to conversion at full screen* |  |  |
| *Sample rate* |  |  |
| *Departure from linearity* |  |  |
| *DC offset error* |  |  |
| *Bandwidth – Voltage* |  |  |
| *Bandwidth – Current* |  |  |

## Compliance verification

[Proposed verification mechanisms are suggestions described in Appendix D of the WEM Procedure: Generator Monitoring Plans. Market Participants may propose any other suitable ongoing verification mechanisms. Market Participants are to include details of the applicable Registered Generator Performance Standards and evidence of compliance. Please duplicate the table for each Generating System as per example from section 2.3of this form.]

1. Ongoing compliance verification of inertia and frequency control and evidence of compliance – Generating System A

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Criteria description** | **Appendix 12 clauses** | **Statement of compliance – Generating System A** | **Verification of compliance – Generating System A** | **Evidence of compliance – Generating System A** |
| Control System damping adequacy | A12.6.1.1 |  | *Test Data and/or Disturbance Data show post-step or post-fault Active Power is Adequately Damped at different pre-step or pre-disturbance Active Power levels, and for different rates of frequency change.* |  |
| Maximum ramp rate expression requirements | A12.6.1.2 |  | *Test Data, Monitoring Data and/or Disturbance Data records the maximum ramp rate as the change in Active Power (measured in MW) across 6 seconds.* |  |
| Provision of disconnection settings | A12.6.1.3 |  | *Provision of all applicable disconnection settings.* |  |
| Control System testing equipment requirements | A12.6.1.4 |  | *Test Data and/or Disturbance Data show all required quantities can be monitored and recorded and appropriate permanently installed equipment is used.* |  |
| Control behaviour after frequency control | A12.6.1.5 |  | *Test Data and/or Disturbance Data show Active Power response when recovering from frequency control at different Active Power output levels, and for different sizes of frequency change to confirm the Generating System can meet the relevant requirements of section A12.5 of the WEM Rules.*  |  |
| Availability of automatic variable Active Power control characteristic | A12.6.2.1(a), A12.6.3.1(a),  |  | *Test Data and/or Disturbance Data show Active Power respond correctly to each frequency change, thereby confirming the Generating System has an automatic variable Active Power control characteristic.* |  |
| Capability for continuous operation in frequency control mode | A12.6.2.1(b), A12.6.3.1(b), |  | *Applicable control system settings are provided to confirm Generating System is in frequency control or frequency response mode; and**Frequency step change Test Data and/or Monitoring Data confirm Generating System Active Power correctly responds to observed frequency in Normal Operating Frequency Band, thereby demonstrating that the Generating System is capable of operating in a mode in which it will automatically alter its Active Power output to arrest and correct to changes in power system frequency; and**Test Data and/or Disturbance Data confirm Generating System Active Power correctly responds to observed frequency that is outside the Normal Operating Frequency Band during a fault, thereby demonstrating that the Generating System is capable of operating in a mode in which it will automatically alter its Active Power output to arrest and correct to changes in power system frequency.* |  |
| Frequency dead band | A12.6.2.1(c), A12.6.3.1(c) |  | *Test data and/or Monitoring Data show frequency control dead band to be within limits specified in the Registered GPS.* |  |
| Droop response (frequency reduction) | A12.6.2.1(d)(i), A12.6.3.2(a) |  | *Applicable Control System settings confirm the required frequency control capability; and**Test Data and/or Disturbance Data demonstrate required frequency droop at different Active Power output levels up to the Rated Maximum Active Power for different sizes of frequency change.*  |  |
| Droop response (frequency increase) | A12.6.2.1(d)(ii), A12.6.3.2(b) |  | *Applicable Control System settings confirm the required frequency control capability; and**Test Data and/or Disturbance Data demonstrate required frequency droop at different Active Power output levels down to the Rated Minimum Active Power for different sizes of frequency change.* |  |
| Sustaining Active Power output | A12.6.2.1(d)(iii), A12.6.3.2(d) |  | *Test Data and/or Disturbance Data show the Generating System can sustain Active Power changes of at least the amounts specified for frequency increase and frequency decrease respectively, and for not less than 10 seconds, at different pre-step or pre-disturbance Active Power output levels.* |  |
| Rate of response and time to sustain new output | A12.6.2.1(d)(iv), A12.6.2.1(d)(v),A12.6.4.3, A12.6.4.4  |  | *Test Data and/or Disturbance Data show Active Power reaches the required rate of response within the limit specified in the Registered GPS for different frequency disturbances.* |  |
| Response capability above 85% of Rated Maximum Active Power | A12.6.3.2(c) |  | *Confirmation that response capability in the Registered GPS is applicable and valid.* |  |
| Active Power not required to be outside rated values | A12.6.4.1 |  | *Monitoring Data show Active Power and ramp rate are within the required limits specified in the Registered GPS.*  |  |
| Requirements of additional source of inertia and frequency control | A12.6.4.2 |  | *The Control System settings for the additional source of Inertia or frequency control are as specified in the Registered GPS* |  |

## Frequency of testing

[Include frequency of testing for each method and each Generating Systems within Facility X.]

## Risks and mitigation

[Include all risks identified and mitigation for each risk identified for all Generating Systems within Facility X.]

1. Risks and mitigation

|  |  |  |
| --- | --- | --- |
| **Risk** | **Relevant Generating System** | **Mitigation** |
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# Disturbance Ride Through for a Frequency Disturbance

## Testing and monitoring

[Include details of testing and monitoring for each Generating Systems within Facility X, considering the principles and information required by WEM Procedure: Generator Monitoring Plans in order for AEMO to understand, assess and approve this Generator Monitoring Plan.]

## Recording or measuring device

[Include details of relevant recording or measuring device for each Generating Systems within Facility X, including demonstration of their compliance with requirements in Attachment 11 of Technical Rules, their appropriateness of the measuring device (accuracy, resolution and reliability) for this specific test (refer to WEM Procedure: Generator Monitoring Plans for requirements for recording or measuring device). Please duplicate the table for each Generating System as per example from section 2.2of this form]

1. Compliance withrequirements in Attachment 11 of the Technical Rules

|  |  |  |
| --- | --- | --- |
| **Description** | **Technical requirement** | **Device specification** |
| *Calibration* |  |  |
| *Analogue to digital to conversion at full screen* |  |  |
| *Sample rate* |  |  |
| *Departure from linearity* |  |  |
| *DC offset error* |  |  |
| *Bandwidth – Voltage* |  |  |
| *Bandwidth – Current* |  |  |

## Compliance verification

[Proposed verification mechanisms are suggestions described in Appendix D of the WEM Procedure: Generator Monitoring Plans. Market Participants may propose any other suitable ongoing verification mechanisms. Market Participants are to include details of the applicable Registered Generator Performance Standards and evidence of compliance. Please duplicate the table for each Generating System as per example from section 2.3 of this form.]

1. Ongoing compliance verification of disturbance ride through for a frequency disturbance and evidence of compliance – Generating System A

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Criteria description** | **Appendix 12 clauses** | **Statement of compliance – Generating System A** | **Verification of compliance – Generating System A** | **Evidence of compliance – Generating System A** |
| Specified network location for this Technical Requirement | A12.7.1.1 |  | *Demonstration that monitoring for all tests undertaken to verify the requirements under A12.7 of the WEM Rules have been performed at the required location.* |  |
| Provision of disconnection settings | A12.7.1.2 |  | *Provision of all applicable disconnection settings.* |  |
| Continuous Uninterrupted Operation - frequency requirements | A12.7.2.1, A12.7.3.1 |  | *Evidence that the Generating System meets the criteria of CUO including investigation of every disconnection of the Generating System is provided to confirm that it meets the frequency requirements in the Registered GPS.* |  |
| Continuous Uninterrupted Operation - ROCOF requirements | A12.7.2.2, A12.7.3.2  |  | *Evidence that the Generating System meets the criteria of CUO including investigation of every disconnection of the Generating System is provided to confirm that it meets the RoCoF requirements in the Registered GPS.* |  |
| Agreement about frequency fall below described bound | A12.7.4.1. |  | *N/A* |  |

## Frequency of testing

[Include frequency of testing for each method and each Generating Systems within Facility X.]

## Risks and mitigation

[Include all risks identified and mitigation for each risk identified for all Generating Systems within Facility X.]

1. Risks and mitigation

|  |  |  |
| --- | --- | --- |
| **Risk** | **Relevant Generating System** | **Mitigation** |
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# Disturbance Ride Through for a Voltage Disturbance

## Testing and monitoring

[Include details of testing and monitoring for each Generating Systems within Facility X, considering the principles and information required by WEM Procedure: Generator Monitoring Plans in order for AEMO to understand, assess and approve this Generator Monitoring Plan.]

## Recording or measuring device

[Include details of relevant recording or measuring device for each Generating Systems within Facility X, including demonstration of their compliance with requirements in Attachment 11 of Technical Rules, their appropriateness of the measuring device (accuracy, resolution and reliability) for this specific test (refer to WEM Procedure: Generator Monitoring Plans for requirements for recording or measuring device). Please duplicate the table for each Generating System as per example from section 2.2 of this form]

1. Compliance withrequirements in Attachment 11 of the Technical Rules – Generating System A

|  |  |  |
| --- | --- | --- |
| **Description** | **Technical requirement** | **Device specification** |
| *Calibration* |  |  |
| *Analogue to digital to conversion at full screen* |  |  |
| *Sample rate* |  |  |
| *Departure from linearity* |  |  |
| *DC offset error* |  |  |
| *Bandwidth – Voltage* |  |  |
| *Bandwidth – Current* |  |  |

## Compliance verification

[Proposed verification mechanisms are suggestions described in Appendix D of the WEM Procedure: Generator Monitoring Plans. Market Participants may propose any other suitable ongoing verification mechanisms. Market Participants are to include details of the applicable Registered Generator Performance Standards and evidence of compliance. Please duplicate the table for each Generating System as per example from section 2.3 of this form.]

1. Ongoing compliance verification of disturbance ride through for a voltage disturbance and evidence of compliance – Generating System A

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Criteria description** | **Appendix 12 clauses** | **Statement of compliance – Generating System A** | **Verification of compliance – Generating System A** | **Evidence of compliance – Generating System A** |
| Specified network location for this Technical Requirement | A12.8.1.1 |  | *Demonstration that all monitoring for undertaken tests to verify the requirements under A12.8 of the WEM Rules have been performed at the required location.* |  |
| Continuous Uninterrupted Operation - 90% < nominal voltage < 110% | A12.8.1.2 |  | *Evidence that the Generating System meets the criteria of CUO including investigation of every disconnection of the Generating System is provided to confirm that disconnection of the Generating System meets the voltage requirements in the Registered GPS.* |  |
| Provision of disconnection settings | A12.8.1.3 |  | *Provision of all applicable disconnection settings.* |  |
| Continuous Uninterrupted Operation - specified voltage ranges | A12.8.2.1, A12.8.3.1 |  | *Evidence that the Generating System meets the criteria of CUO including investigation of every disconnection of the Generating System is provided to confirm that the disconnection of the Generating System meets the voltage range requirements in the Registered GPS.* |  |
| Agreement of zero percent voltage level duration | A12.8.3.2 |  | *Evidence that the Generating System meets the criteria of CUO including investigation of every disconnection of the Generating System is provided to confirm that the Generating System did not disconnect while the voltage was at 0% for a duration less than required in the Registered GPS.* |  |
| Provision of operational arrangements  | A12.8.3.3 |  | *Confirmation that the operational arrangements in the Registered GPS are applicable and valid.* |  |

## Frequency of testing

[Include frequency of testing for each method and each Generating Systems within Facility X.]

## Risks and mitigation

[Include all risks identified and mitigation for each risk identified for all Generating Systems within Facility X.]

1. Risks and mitigation

|  |  |  |
| --- | --- | --- |
| **Risk** | **Relevant Generating System** | **Mitigation** |
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# Disturbance Ride Through for Multiple Disturbances

## Testing and monitoring

[Include details of testing and monitoring for each Generating Systems within Facility X, considering the principles and information required by WEM Procedure: Generator Monitoring Plans in order for AEMO to understand, assess and approve this Generator Monitoring Plan.]

## Recording or measuring device

[Include details of relevant recording or measuring device for each Generating Systems within Facility X, including demonstration of their compliance with requirements in Attachment 11 of Technical Rules, their appropriateness of the measuring device (accuracy, resolution and reliability) for this specific test (refer to WEM Procedure: Generator Monitoring Plans for requirements for recording or measuring device). Please duplicate the table for each Generating System as per example from section 2.2 of this form]

1. Compliance withrequirements in Attachment 11 of the Technical Rules – Generating System A

|  |  |  |
| --- | --- | --- |
| **Description** | **Technical requirement** | **Device specification** |
| *Calibration* |  |  |
| *Analogue to digital to conversion at full screen* |  |  |
| *Sample rate* |  |  |
| *Departure from linearity* |  |  |
| *DC offset error* |  |  |
| *Bandwidth – Voltage* |  |  |
| *Bandwidth – Current* |  |  |

## Compliance verification

[Proposed verification mechanisms are suggestions described in Appendix D of the WEM Procedure: Generator Monitoring Plans. Market Participants may propose any other suitable ongoing verification mechanisms. Market Participants are to include details of the applicable Registered Generator Performance Standards and evidence of compliance. Please duplicate the table for each Generating System as per example from section 2.3 of this form.]

1. Ongoing compliance verification of disturbance ride through for multiple disturbances and evidence of compliance – Generating System A

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Criteria description** | **Appendix 12 clauses** | **Statement of compliance – Generating System A** | **Verification of compliance – Generating System A** | **Evidence of compliance – Generating System A** |
| Provision of disconnection settings | A12.9.1.2 |  | *Provision of all applicable disconnection settings.* |  |
| Operational arrangement under abnormal conditions | A12.9.1.3 |  | *Confirmation that any operational arrangements included in the Registered GPS are applicable and valid.* |  |
| Operation of auto-reclose requirement | A12.9.1.4 |  | *Where there are multiple disturbances, confirmation that a fault that is re-established following an automatic reclose Protection Scheme has been considered as a separate disturbance.* |  |
| Reactive current contribution capability | A12.9.1.5, A12.9.1.6 |  | *Provision of Manufacturer’s datasheet to confirm that the reactive current contribution at the required location, equals or exceeds the required Maximum Continuous Current (or is equal or exceed 250% of the Maximum Continuous Current for a Synchronous Generating System) of the Generating System or Generating Unit, whichever is applicable; or**Generation System Model confirms that the reactive current contribution at the required location equals or exceeds the required Maximum Continuous Current of the Generating System or Generating Unit, whichever is applicable (or equal or exceeds 250% of the Maximum Continuous Current for a Synchronous Generating System), provided the observed performance of the Generation System matches the predicted performance of the Generation System, using the Generation System Model.* |  |
| Continuous Uninterrupted Operation - specified disturbances requirements | A12.9.2.2, A12.9.3.2 |  | *Provision of applicable Control System and/or Protection scheme settings to confirm the Generating System can remain in CUO for any of the specified disturbances, provided it is not an event that would cause the Generating System to not be in CUO by design; and**For each occurrence of multiple disturbances, provision of Disturbance Data showing the Generating System remained in CUO for any of the specified disturbances, provided it is not an event that would cause the Generating System to not be in CUO by design.* |  |
| Continuous Uninterrupted Operation - series of disturbances requirements | A12.9.2.3, A12.9.3.3 |  | *Provision of applicable Control System and/or Protection scheme settings to confirm that the Generating System can remain in CUO for a series of up to 15 disturbances within any 5 minute period; and**For each occurrence of multiple disturbances, Disturbance Data shows the Generating System can remain in CUO for a series of disturbances specified in the Registered GPS.* |  |
| Reactive current contribution during the fault | A12.9.2.4(a), A12.9.2.5(a), A12.9.2.6, A12.9.3.4(a), A12.9.3.5(a), A12.9.3.6 |  | *For each occurrence of a disturbance, Disturbance Data or evidence from an investigation demonstrate reactive current level pre-disturbance, during a fault and post-disturbance and that reactive current response meets the specified level as required in the Registered GPS. In addition, for Asynchronous Generating Systems, the reactive power response is triggered at specified voltage range.*  |  |
| Reactive Power requirements after the fault clearance | A12.9.2.4(b) |  | *For each occurrence of a disturbance, Disturbance Data or evidence from an investigation demonstrate Reactive Power supply or absorb sufficient to ensure voltage level at Connection Point or another agreed location to be within the CUO range following clearance of the fault.* |  |
| Active Power recovery after the fault clearance | A12.9.2.4(c), A12.9.2.5(b), A12.9.3.4(a), A12.9.3.4(b), A12.9.3.5(b) |  | *For each occurrence of a disturbance, Disturbance Data shows the Active Power level pre-disturbance and post-disturbance, and provides confirmation that the Active Power level at required location returns to specified level within the required time, following fault clearance.* |  |
| Reactive current Rise Time, Settling Time and damping adequacy | A12.9.2.7, A12.9.3.7, A12.9.3.8 |  | *For each occurrence of a disturbance, Disturbance Data shows reactive current response has a Rise Time and Settling Time during a fault that are within the specified limit and the response following fault clearance is Adequately Damped.*  |  |
| Capability to maintain Rated Maximum Apparent Power during over-voltages | A12.9.2.8(a) |  | *Provision of Active Power versus Reactive Power Generator Capability Chart at specified over-voltage range, to demonstrate that there is sufficient current to maintain Rated Maximum Apparent power at the specified over-voltage range; andFor each occurrence of Connection Point voltage being at specified over-voltage range, Disturbance Data shows sufficient current to maintain Rated Maximum Apparent Power.* |  |
| Capability to maintain Maximum Continuous Current during under-voltages | A12.9.2.8(b) |  | *Provision of Active Power versus Reactive Power Generator Capability Chart at specified under-voltage range, to demonstrate that Maximum Continuous Current is available at the specified under-voltage range; andFor each occurrence of Connection Point voltage being at specified under-voltage range, Disturbance Data shows current achieving the level of Maximum Continuous Current of the Generating System.* |  |
| Accepted performance level to not cause other connections to trip | A12.9.4.1 |  | *N/A[[1]](#footnote-2)* |  |

## Frequency of testing

[Include frequency of testing for each method and each Generating Systems within Facility X.]

## Risks and mitigation

[Include all risks identified and mitigation for each risk identified for all Generating Systems within Facility X.]

1. Risks and mitigation

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| --- | --- | --- |
| **Risk** | **Relevant Generating System** | **Mitigation** |
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# Disturbance Ride Through for Partial Load Rejection

## Testing and monitoring

[Include details of testing and monitoring for each Generating Systems within Facility X, considering the principles and information required by WEM Procedure: Generator Monitoring Plans in order for AEMO to understand, assess and approve this Generator Monitoring Plan.]

## Recording or measuring device

[Include details of relevant recording or measuring device for each Generating Systems within Facility X, including demonstration of their compliance with requirements in Attachment 11 of Technical Rules, their appropriateness of the measuring device (accuracy, resolution and reliability) for this specific test (refer to WEM Procedure: Generator Monitoring Plans for requirements for recording or measuring device). Please duplicate the table for each Generating System as per example from section 2.2 of this form]

1. Compliance withrequirements in Attachment 11 of the Technical Rules – Generating System A

|  |  |  |
| --- | --- | --- |
| **Description** | **Technical requirement** | **Device specification** |
| *Calibration* |  |  |
| *Analogue to digital to conversion at full screen* |  |  |
| *Sample rate* |  |  |
| *Departure from linearity* |  |  |
| *DC offset error* |  |  |
| *Bandwidth – Voltage* |  |  |
| *Bandwidth – Current* |  |  |

## Compliance verification

[Proposed verification mechanisms are suggestions described in Appendix D of the WEM Procedure: Generator Monitoring Plans. Market Participants may propose any other suitable ongoing verification mechanisms. Market Participants are to include details of the applicable Registered Generator Performance Standards and evidence of compliance. Please duplicate the table for each Generating System as per example from section 2.3 of this form.]

1. Ongoing compliance verification of disturbance ride through for partial load rejection and evidence of compliance – Generating System A

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Criteria description** | **Appendix 12 clauses** | **Statement of compliance – Generating System A** | **Verification of compliance – Generating System A** | **Evidence of compliance – Generating System A** |
| Continuous Uninterrupted Operation - sudden reduction in Active Power | A12.10.2.1, A12.10.3.1 |  | *Evidence that the Generating System meets the criteria of CUO including investigation of every disconnection of a Generating System is provided to confirm that the disconnection is not caused by overspeed protection or other relevant protection, which has operated as a result of a load rejection event, provided the reduction in Active Power is within the specified range in the Registered GPS; and**Details of applicable protection system settings (such as over speed protection, reverse power protection) are provided to confirm the intended ride-through capability in the event of sudden Active Power reduction requirement; and**Test Data demonstrates that the Generating System and each of its operating Units remain CUO following a sudden reduction in Active Power, provided the reduction is within the specified range in the Registered GPS.* |  |

## Frequency of testing

[Include frequency of testing for each method and each Generating Systems within Facility X.]

## Risks and mitigation

[Include all risks identified and mitigation for each risk identified for all Generating Systems within Facility X.]

1. Risks and mitigation

|  |  |  |
| --- | --- | --- |
| **Risk** | **Relevant Generating System** | **Mitigation** |
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# Disturbance Ride Through for Quality of Supply

## Testing and monitoring

[Include details of testing and monitoring for each Generating Systems within Facility X, considering the principles and information required by WEM Procedure: Generator Monitoring Plans in order for AEMO to understand, assess and approve this Generator Monitoring Plan.]

## Recording or measuring device

[Include details of relevant recording or measuring device for each Generating Systems within Facility X, including demonstration of their compliance with requirements in Attachment 11 of Technical Rules, their appropriateness of the measuring device (accuracy, resolution and reliability) for this specific test (refer to WEM Procedure: Generator Monitoring Plans for requirements for recording or measuring device). Please duplicate the table for each Generating System as per example from section 2.2 of this form]

1. Compliance withrequirements in Attachment 11 of the Technical Rules – Generating System A

|  |  |  |
| --- | --- | --- |
| **Description** | **Technical requirement** | **Device specification** |
| *Calibration* |  |  |
| *Analogue to digital to conversion at full screen* |  |  |
| *Sample rate* |  |  |
| *Departure from linearity* |  |  |
| *DC offset error* |  |  |
| *Bandwidth – Voltage* |  |  |
| *Bandwidth – Current* |  |  |

## Compliance verification

[Proposed verification mechanisms are suggestions described in Appendix D of the WEM Procedure: Generator Monitoring Plans. Market Participants may propose any other suitable ongoing verification mechanisms. Market Participants are to include details of the applicable Registered Generator Performance Standards and evidence of compliance. Please duplicate the table for each Generating System as per example from section 2.3 of this form.]

1. Ongoing compliance verification of disturbance ride through for Quality of Supply and evidence of compliance – Generating System A

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Criteria description** | **Appendix 12 clauses** | **Statement of compliance – Generating System A** | **Verification of compliance – Generating System A** | **Evidence of compliance – Generating System A** |
| No disconnection requirement for specified Quality of Supply | A12.11.2.1., A12.11.3.1. |  | *Evidence from investigation of every disconnection of a Generating System is provided to confirm that the disconnection is not caused by power-quality protection (voltage fluctuation, harmonic voltage distortion and voltage unbalance) conditions at the Connection Point, while all power quality quantities are within specified values in the Registered GPS.* |  |

## Frequency of testing

[Include frequency of testing for each method and each Generating Systems within Facility X.]

## Risks and mitigation

[Include all risks identified and mitigation for each risk identified for all Generating Systems within Facility X.]

1. Risks and mitigation

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| **Risk** | **Relevant Generating System** | **Mitigation** |
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# Quality of Electricity Generated

## Testing and monitoring

[Include details of testing and monitoring for each Generating Systems within Facility X, considering the principles and information required by WEM Procedure: Generator Monitoring Plans in order for AEMO to understand, assess and approve this Generator Monitoring Plan.]

## Recording or measuring device

[Include details of relevant recording or measuring device for each Generating Systems within Facility X, including demonstration of their compliance with requirements in Attachment 11 of Technical Rules, their appropriateness of the measuring device (accuracy, resolution and reliability) for this specific test (refer to WEM Procedure: Generator Monitoring Plans for requirements for recording or measuring device). Please duplicate the table for each Generating System as per example from section 2.2 of this form]

1. Compliance withrequirements in Attachment 11 of the Technical Rules

|  |  |  |
| --- | --- | --- |
| **Description** | **Technical requirement** | **Device specification** |
| *Calibration* |  |  |
| *Analogue to digital to conversion at full screen* |  |  |
| *Sample rate* |  |  |
| *Departure from linearity* |  |  |
| *DC offset error* |  |  |
| *Bandwidth – Voltage* |  |  |
| *Bandwidth – Current* |  |  |

## Compliance verification

[Proposed verification mechanisms are suggestions described in Appendix D of the WEM Procedure: Generator Monitoring Plans. Market Participants may propose any other suitable ongoing verification mechanisms. Market Participants are to include details of the applicable Registered Generator Performance Standards and evidence of compliance. Please duplicate the table for each Generating System as per example from section 2.3 of this form.]

1. Ongoing compliance verification of Quality of Electricity generated and evidence of compliance – Generating System A

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Criteria description** | **Appendix 12 clauses** | **Statement of compliance – Generating System A**  | **Verification of compliance – Generating System A**  | **Evidence of compliance – Generating System A** |
| Voltage imbalance allocation | A12.12.1.1 |  | *Demonstration that the derived voltage imbalance produced by the Generating System at the Connection Point, must not be greater than the limits in the Registered GPS.*  |  |
| Voltage fluctuation allocation | A12.12.2.1(a), A12.12.3.1(a) |  | *Demonstration that the derived voltage fluctuation produced by the Generating System at the Connection Point, must not be greater than the specified limits.* |  |
| Harmonic voltage allocation | A12.12.2.1(b), A12.12.3.1(b) |  | *Demonstration that the derived harmonic voltage distortion produced by the Generating System at the Connection Point, must not be greater than the specified limits; and**Where the specified limits are in the form of harmonic current distortion, demonstration that the derived harmonic current distortion produced by the Generation System at the Connection Point, must not be greater than the specified limits.* |  |
| No prevention from meeting Network Operator obligations | A12.12.4.1 |  | *N/A* |  |

## Frequency of testing

[Include frequency of testing for each method and each Generating Systems within Facility X.]

## Risks and mitigation

[Include all risks identified and mitigation for each risk identified for all Generating Systems within Facility X.]

1. Risks and mitigation

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| **Risk** | **Relevant Generating System** | **Mitigation** |
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# Generation Protection Systems

## Testing and monitoring

[Include details of testing and monitoring for each Generating Systems within Facility X, considering the principles and information required by WEM Procedure: Generator Monitoring Plans in order for AEMO to understand, assess and approve this Generator Monitoring Plan.]

## Recording or measuring device

[Include details of relevant recording or measuring device for each Generating Systems within Facility X, including demonstration of their compliance with requirements in Attachment 11 of Technical Rules, their appropriateness of the measuring device (accuracy, resolution and reliability) for this specific test (refer to WEM Procedure: Generator Monitoring Plans for requirements for recording or measuring device). Please duplicate the table for each Generating System as per example from section 2.2 of this form]

1. Compliance withrequirements in Attachment 11 of the Technical Rules

|  |  |  |
| --- | --- | --- |
| **Description** | **Technical requirement** | **Device specification** |
| *Calibration* |  |  |
| *Analogue to digital to conversion at full screen* |  |  |
| *Sample rate* |  |  |
| *Departure from linearity* |  |  |
| *DC offset error* |  |  |
| *Bandwidth – Voltage* |  |  |
| *Bandwidth – Current* |  |  |

## Compliance verification

[Proposed verification mechanisms are suggestions described in Appendix D of the WEM Procedure: Generator Monitoring Plans. Market Participants may propose any other suitable ongoing verification mechanisms. Market Participants are to include details of the applicable Registered Generator Performance Standards and evidence of compliance. Please duplicate the table for each Generating System as per example from section 2.3 of this form.]

1. Ongoing compliance verification of generation Protection systems and evidence of compliance – Generating System A

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| --- | --- | --- | --- | --- |
| **Criteria description** | **Appendix 12 clauses** | **Statement of compliance – Generating System A** | **Verification of compliance – Generating System A** | **Evidence of compliance – Generating System A** |
| Protection requirements as per the Technical Rules | A12.13.2.1, A12.13.3.1 |  | *Details of applicable protection settings have been provided to confirm faults will be cleared within the specified time; and**Disturbance Data providing confirmation of faults cleared within specified time.* |  |
| Redundancy and fault clearance requirements | A12.13.2.1, A12.13.3.2 |  | *Confirmation of availability and continual functionality of the redundant Protection schemes; and**Provision of applicable protection settings of the redundant Protection schemes to confirm faults will be cleared within the prescribed times.* |  |
| Anti-islanding protection requirements | A12.13.2.1, A12.13.3.3 |  | *Confirmation of availability and continual functionality of the anti-islanding protection; and**Using Disturbance Data, provision of confirmation of correct anti-islanding protection operation preventing the Generating System from supplying an isolated portion of the SWIS when it is not secure to do so; and**Verify the applied settings in accordance with the relevant documented guidelines.* |  |
| Protection Schemes necessary for abnormal conditions | A12.13.2.1, A12.13.3.4 |  | *Confirmation of availability and continual functionality of the relevant Protection Schemes necessary to disconnect the Generating System under abnormal conditions; and**Using Disturbance Data, provision of confirmation demonstrating correct operation of relevant Protection schemes to disconnect Generating System under abnormal conditions; and**Confirmation of the applicable settings as specified in Appendix 12 of the WEM Rules.* |  |
| Provision of all Protection Scheme settings | A12.13.2.1, A12.13.3.5 |  | *Provision of the applicable Protection Scheme settings as referred to in the Registered GPS.* |  |

## Frequency of testing

[Include frequency of testing for each method and each Generating Systems within Facility X.]

## Risks and mitigation

[Include all risks identified and mitigation for each risk identified for all Generating Systems within Facility X.]

1. Risks and mitigation

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| **Risk** | **Relevant Generating System** | **Mitigation** |
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# Remote Monitoring Requirements

## Testing and monitoring

[Include details of testing and monitoring for each Generating Systems within Facility X, considering the principles and information required by WEM Procedure: Generator Monitoring Plans in order for AEMO to understand, assess and approve this Generator Monitoring Plan.]

## Recording or measuring device

[Include details of relevant recording or measuring device for each Generating Systems within Facility X, including demonstration of their compliance with requirements in Attachment 11 of Technical Rules, their appropriateness of the measuring device (accuracy, resolution and reliability) for this specific test (refer to WEM Procedure: Generator Monitoring Plans for requirements for recording or measuring device). Please duplicate the table for each Generating System as per example from section 2.2 of this form]

1. Compliance withrequirements in Attachment 11 of the Technical Rules – Generating System A

|  |  |  |
| --- | --- | --- |
| **Description** | **Technical requirement** | **Device specification** |
| *Calibration* |  |  |
| *Analogue to digital to conversion at full screen* |  |  |
| *Sample rate* |  |  |
| *Departure from linearity* |  |  |
| *DC offset error* |  |  |
| *Bandwidth – Voltage* |  |  |
| *Bandwidth – Current* |  |  |

## Compliance verification

[Proposed verification mechanisms are suggestions described in Appendix D of the WEM Procedure: Generator Monitoring Plans. Market Participants may propose any other suitable ongoing verification mechanisms. Market Participants are to include details of the applicable Registered Generator Performance Standards and evidence of compliance. Please duplicate the table for each Generating System as per example from section 2.3 of this form.]

1. Ongoing compliance verification of Remote Monitoring requirements and evidence of compliance – Generating System A

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Criteria description** | **Appendix 12 clauses** | **Statement of compliance – Generating System A** | **Verification of compliance – Generating System A** | **Evidence of compliance – Generating System A** |
| Installation of Remote Monitoring Equipment | A12.14.2.1, A12.14.3.1 |  | *Confirmation of the availability and continual functionality of the Remote Monitoring Equipment.* |  |
| Conformance to Communication Standard | A12.14.2.1, A12.14.3.2 |  | *All relevant requirements in Communication Standard are listed and evidence of conformance of the Remote Monitoring Equipment with the Communication Standard and other specified requirements in the Registered GPS is provided.* |  |
| Provision of specified signals for Remote Monitoring Equipment | A12.14.2.1, A12.14.3.3 |  | *Confirmation of the availability and continual functionality of the specified signals WEM Procedure and such other information specified in the Registered GPS.* |  |
| Availability of Remote Monitoring Equipment | A12.14.2.1, A12.14.3.4 |  | *Confirmation of the availability and continual functionality of Remote Monitoring Equipment at all times, subject to Outages as agreed with AEMO.* |  |

## Frequency of testing

[Include frequency of testing for each method and each Generating Systems within Facility X.]

## Risks and mitigation

[Include all risks identified and mitigation for each risk identified for all Generating Systems within Facility X.]

1. Risks and mitigation

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| **Risk** | **Relevant Generating System** | **Mitigation** |
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# Remote Control Requirements

## Testing and monitoring

[Include details of testing and monitoring for each Generating Systems within Facility X, considering the principles and information required by WEM Procedure: Generator Monitoring Plans in order for AEMO to understand, assess and approve this Generator Monitoring Plan.]

## Recording or measuring device

[Include details of relevant recording or measuring device for each Generating Systems within Facility X, including demonstration of their compliance with requirements in Attachment 11 of Technical Rules, their appropriateness of the measuring device (accuracy, resolution and reliability) for this specific test (refer to WEM Procedure: Generator Monitoring Plans for requirements for recording or measuring device). Please duplicate the table for each Generating System as per example from section 2.2 of this form]

1. Compliance withrequirements in Attachment 11 of the Technical Rules – Generating System A

|  |  |  |
| --- | --- | --- |
| **Description** | **Technical requirement** | **Device specification** |
| *Calibration* |  |  |
| *Analogue to digital to conversion at full screen* |  |  |
| *Sample rate* |  |  |
| *Departure from linearity* |  |  |
| *DC offset error* |  |  |
| *Bandwidth – Voltage* |  |  |
| *Bandwidth – Current* |  |  |

## Compliance verification

[Proposed verification mechanisms are suggestions described in Appendix D of the WEM Procedure: Generator Monitoring Plans. Market Participants may propose any other suitable ongoing verification mechanisms. Market Participants are to include details of the applicable Registered Generator Performance Standards and evidence of compliance. Please duplicate the table for each Generating System as per example from section 2.3 of this form.]

1. Ongoing compliance verification of Remote Control requirements and evidence of compliance – Generating System A

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Criteria description** | **Appendix 12 clauses** | **Statement of compliance – Generating System A** | **Verification of compliance – Generating System A** | **Evidence of compliance – Generating System A** |
| Installation of Remote Control Equipment | A12.15.2.1, A12.5.3.1 |  | *Confirmation of the availability and continual functionality of the Remote Control Equipment (including capability to disconnect Generating Units from the Transmission System), where required by the Registered GPS.* |  |
| Conformance to Communication Standard | A12.15.2.1, A12.5.3.2 |  | *All relevant requirements in Communication Standard are listed and evidence of conformance of the Remote Control Equipment with the Communication Standard and other specified requirements in the Registered GPS is provided.* |  |
| Availability of Remote Control Equipment | A12.15.2.1, A12.5.3.3 |  | *Confirmation of the availability and continual functionality of the Remote Control Equipment at all times, subject to Outages as agreed with AEMO.* |  |

## Frequency of testing

[Include frequency of testing for each method and each Generating Systems within Facility X.]

## Risks and mitigation

[Include all risks identified and mitigation for each risk identified for all Generating Systems within Facility X.]

1. Risks and mitigation

|  |  |  |
| --- | --- | --- |
| **Risk** | **Relevant Generating System** | **Mitigation** |
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# Communication Equipment Requirements

## Testing and monitoring

[Include details of testing and monitoring for each Generating Systems within Facility X, considering the principles and information required by WEM Procedure: Generator Monitoring Plans in order for AEMO to understand, assess and approve this Generator Monitoring Plan.]

## Recording or measuring device

[Include details of relevant recording or measuring device for each Generating Systems within Facility X, including demonstration of their compliance with requirements in Attachment 11 of Technical Rules, their appropriateness of the measuring device (accuracy, resolution and reliability) for this specific test (refer to WEM Procedure: Generator Monitoring Plans for requirements for recording or measuring device). Please duplicate the table for each Generating System as per example from section 2.2 of this form]

1. Compliance withrequirements in Attachment 11 of the Technical Rules – Generating System A

|  |  |  |
| --- | --- | --- |
| **Description** | **Technical requirement** | **Device specification** |
| *Calibration* |  |  |
| *Analogue to digital to conversion at full screen* |  |  |
| *Sample rate* |  |  |
| *Departure from linearity* |  |  |
| *DC offset error* |  |  |
| *Bandwidth – Voltage* |  |  |
| *Bandwidth – Current* |  |  |

## Compliance verification

[Proposed verification mechanisms are suggestions described in Appendix D of the WEM Procedure: Generator Monitoring Plans. Market Participants may propose any other suitable ongoing verification mechanisms. Market Participants are to include details of the applicable Registered Generator Performance Standards and evidence of compliance. Please duplicate the table for each Generating System as per example from section 2.3 of this form.]

1. Ongoing compliance verification of Communications Equipment requirements and evidence of compliance – Generating System A

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Criteria description** | **Appendix 12 clauses** | **Statement of compliance – Generating System A** | **Verification of compliance – Generating System A** | **Evidence of compliance – Generating System A** |
| Provision and maintenance of communication paths for specified equipment | A12.16.2.1, A12.16.3.1 |  | *Confirmation of the availability and continual functionality of the communication links between the Remote Monitoring Equipment and Remote Communications Equipment installed at a Generating Unit to a communications interface at the relevant Power Station and in a location as specified in the Registered GPS, including any redundancies.* |  |
| Provision and maintenance of speech communication channel for specified calls | A12.16.2.1, A12.16.3.2 |  | *Confirmation of the availability and continual functionality of a speech communication channel as required in the Registered GPS.* |  |
| Conformance of the speech communication channel with the Communication Standard | A12.16.2.1, A12.16.3.3 |  | *All relevant requirements in Communication Standard are listed and evidence of conformance with all requirements is provided.* |  |
| Public switched telephone network requirements | A12.16.2.1, A12.16.3.4 |  | *Confirmation of sole-purpose connection for operational communications.* |  |
| Availability of communication path | A12.16.2.1, A12.16.3.5 |  | *Confirmation of the availability and continual functionality of the communication paths to any applicable Remote Monitoring Equipment or Remote Communication Equipment, including any redundancies and subject to Outages as agreed by AEMO.* |  |
| Primary Speech Communication Channel | A12.16.2.1, A12.16.3.6 |  | *Confirmation that the Primary Speech Communication Channel is maintained in good working order.*  |  |

## Frequency of testing

[Include frequency of testing for each method and each Generating Systems within Facility X.]

## Risks and mitigation

[Include all risks identified and mitigation for each risk identified for all Generating Systems within Facility X.]

1. Risks and mitigation

|  |  |  |
| --- | --- | --- |
| **Risk** | **Relevant Generating System** | **Mitigation** |
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# Generation System Model

## Testing and monitoring

[Include details of testing and monitoring for each Generating Systems within Facility X, considering the principles and information required by WEM Procedure: Generator Monitoring Plans in order for AEMO to understand, assess and approve this Generator Monitoring Plan.]

## Recording or measuring device

[Include details of relevant recording or measuring device for each Generating Systems within Facility X, including demonstration of their compliance with requirements in Attachment 11 of Technical Rules, their appropriateness of the measuring device (accuracy, resolution and reliability) for this specific test (refer to WEM Procedure: Generator Monitoring Plans for requirements for recording or measuring device). Please duplicate the table for each Generating System as per example from section 2.2 of this form]

1. Compliance withrequirements in Attachment 11 of the Technical Rules – Generating System A

|  |  |  |
| --- | --- | --- |
| **Description** | **Technical requirement** | **Device specification** |
| *Calibration* |  |  |
| *Analogue to digital to conversion at full screen* |  |  |
| *Sample rate* |  |  |
| *Departure from linearity* |  |  |
| *DC offset error* |  |  |
| *Bandwidth – Voltage* |  |  |
| *Bandwidth – Current* |  |  |

## Compliance verification

[Proposed verification mechanisms are suggestions described in Appendix D of the WEM Procedure: Generator Monitoring Plans. Market Participants may propose any other suitable ongoing verification mechanisms. Market Participants are to include details of the applicable Registered Generator Performance Standards and evidence of compliance. Please duplicate the table for each Generating System as per example from section 2.3 of this form.]

1. Ongoing compliance verification of Generation System Model and evidence of compliance – Generating System A

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Criteria description** | **Appendix 12 clauses** | **Statement of compliance – Generating System A** | **Verification of compliance – Generating System A** | **Evidence of compliance – Generating System A** |
| Provision of modelling data | A12.17.2.1, A12.17.3.1 |  | *Confirmation of validity of all provided modelling data.* |  |
| Adequacy of modelling data | A12.17.2.1, A12.17.3.2 |  | *Overlays of simulated and real-life performances and demonstration that modelling data is sufficient to enable the Network Operator or AEMO to predict the output of the Generation System under all power system conditions, to within the required range, in accordance with WEM Procedure: Generator Model Submission and Maintenance.* |  |
| Accuracy of modelling data | A12.17.2.1, A12.17.3.3 |  | *Overlays of simulated and real-life performances and demonstration that observed performance of the Generation System matches the predicted performance of the Generation System, using the Generation System Model, as assessed by the Network Operator or AEMO, to within the required range, in accordance with WEM Procedure: Generator Model Submission and Maintenance.* |  |
| Provision of Generating System Model updates | A12.17.2.1, A12.17.3.4 |  | *Confirmation of provision of updates to the Generation System Model in order to meet the requirements of the relevant Technical Requirement in accordance with the timeframes specified in the WEM Procedure Generation System Model Submission and Maintenance.* |  |

## Frequency of testing

[Include frequency of testing for each method and each Generating Systems within Facility X.]

## Risks and mitigation

[Include all risks identified and mitigation for each risk identified for all Generating Systems within Facility X.]

1. Risks and mitigation

|  |  |  |
| --- | --- | --- |
| **Risk** | **Relevant Generating System** | **Mitigation** |
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# Attachments

[Include all attachments listed in the former sections of the form.]

1. For each disconnection of a Generating System or a Load, investigation by a Network Operator or AEMO concludes that it is not caused by the relevant Generating System. [↑](#footnote-ref-2)