

WEM Reform Program

Generator Monitoring Plans & Testing and Verification Mechanism

WRIG – 26 November 2020

Agenda

1. Overview of Generator Monitoring Plans
2. The WEM Procedure:
 - Template Generator Monitoring Plan
 - Testing and verification mechanism
 - Submission process
 - Assessment/approval process
 - Transitional arrangement
 - Non-compliance and reporting
3. GPS System overview

Generator Monitoring Plans

Overview – What does it mean to everyone?

For AEMO

- Developing the requirements of the 'Template Generator Monitoring Plan'
- Defining the process for assessing/approving proposed Generator Monitoring Plans, including during the transitional phase
- Specifying required tests for GPS commissioning
- Defining the submission process of non-compliance notifications and Rectification Plans

For Market Participants

- Required to submit proposed Generator Monitoring Plans for approval per Template Generator Monitoring Plan, after issue of 'Registered GPS'
NOTE: Existing Generating Systems may submit Generator Monitoring Plans prior to issue of 'Registered GPS'.

For Network Operator

- Issue of 'Approval to Generate' requires an approved Generator Monitoring Plan.

Template Generator Monitoring Plans

Overview – what is it?

This template is required by WEM Rules 3A.6.2 and has specific meaning in the Rules.

The Procedure documents:

- The Principles that must be considered in developing a Generator Monitoring Plan
- Information and data that must be provided in a Generator Monitoring Plan, including format and form
- Requirements to retain records relevant to Registered GPS & Generator Monitoring Plan

Template Generator Monitoring Plan: General Principles

- Balance between:
 - Ability to ascertain compliance status conclusively
 - Risks that may be created as a result of testing
 - Efficiency and practicality of implementation
 - Regular review & continuous improvements

A Market Participant must consider the following compliance principles when developing a Generator Monitoring Plan:

- (a) the test and monitoring regime (including relevant measuring and recording devices¹), verification mechanism and frequency of testing and monitoring, must be such that all relevant compliance statuses of an applicable Registered Generator Performance Standards can be conclusively established;
- (b) Where the compliance of the relevant part of an applicable Registered Generator Performance Standard cannot be demonstrated through generator performance testing and monitoring, alternative methods to demonstrate compliance must be specified (e.g. provision of disconnection settings);
- (c) consideration for any risks created by the Generator Monitoring Plan, while maintaining the ability to conclusively establish relevant compliance status of an applicable Registered Generator Performance Standards;
- (d) consideration for efficiency and practicality of implementing the Generator Monitoring Plan, which include but are not limited to implementation costs and availability of skills and labour, while maintaining the ability to conclusively establish relevant compliance status of an applicable Registered Generator Performance Standard; and
- (e) regular review and updates considering learnings from past implementation of the Generator Monitoring Plan, continuous changes and improvement relevant to any parts of the Generator Monitoring Plan (e.g. testing and monitoring regime and verification mechanisms).

Template Generator Monitoring Plan: Information & data requirements

- Minimum requirements:
 - Must include applicable Registered GPS
 - Testing and verification (to be elaborated)
 - Details of non compliance
 - Audit/review process
 - Proposed commencement date
 - Proposed timeframe for evidence of compliance

A proposed Generator Monitoring Plan submitted by a Market Participant to AEMO for approval in accordance with paragraph 5.5 in this Procedure, must contain as a minimum, for each Technical Requirement described in Appendix 12 of the WEM Rules:

- (a) the applicable Registered Generator Performance Standard;
- (b) a **compliance testing and monitoring methodology**, where specific requirements are further described in paragraph 5.2 of this Procedure;
- (c) **mechanism to verify compliance**, specific requirements are further described in paragraph 5.3 of this Procedure;
- (d) the **frequency of testing or proposed monitoring period**, where specific requirements are further described in paragraph 5.4 of this Procedure;
- (e) details of any non-compliance and suspected non-compliance, rectification and status of compliance at the time of submission of a proposed Generator Monitoring Plan;
- (f) a process for the audit or review of the Generator Monitoring Plan, including the process and frequency of the review;
- (g) any relevant information requested by AEMO in accordance with clause 3A.9.2, 3A.10.3 and 3A.10.4 of the WEM Rules;
- (h) the proposed commencement date of an approved Generator Monitoring Plan ; and
- (i) a proposed timeframe for when evidence of compliance to the Generator Monitoring Plan can be provided (which has the meaning described in paragraph 4.4 in this Procedure).

Template Generator Monitoring Plans

Form

A 'form' will be published to provide guidance for development of a Generator Monitoring Plan

- Define how certain information must be provided (format/structure) for clear identification of compliance status.

Generator Monitoring Plans: Testing & Verification

Overview

Required by WEM Rules clause 3A.9.1:

- How will compliance with Registered GPS be verified
- How will compliance with a Generator Monitoring Plan be verified

The Procedure documents:

- Testing & Monitoring Regime
 - Including measuring device
- Verification mechanism considered reasonable & appropriate by AEMO
- Frequency of testing considered reasonable & appropriate by AEMO

Testing and Verification Mechanism: Testing and monitoring regime

Requirements include:

- Consideration for specific requirements of each Registered GPS
- Appropriate verification mechanism (to be elaborated)
- Requirements of measuring equipment
- Variation in performance with operating/ ambient conditions
- Types of Generating Units within a Generating System
- Risks & mitigations

Market Participants may propose testing and monitoring methods they consider suitable, however these must demonstrate consideration of the template principles, and include any mandatory tests specified by AEMO.

Testing and Verification Mechanism: Commissioning Tests for initial compliance

Tests that must be conducted in order to demonstrate compliance of a commissioning Generating System or following a significant/ material change

- Refer to tests described in Technical Rules Attachment 11 where applicable

Testing and Verification Mechanism: Ongoing verification mechanism

- Mechanism depends on how the requirement is specified e.g.
 - Quantified
 - Provision of information
 - Installation & availability of equipment
 - Connection status
- Procedure will contain guidance on mechanisms AEMO determines are reasonable and appropriate

A Technical Requirement must be verified considering the following:

- where a requirement for performance is quantified in a Technical Requirement (such as speed of response and accuracy level), the verification mechanism must be such that the required performance can be quantified;
- where a Technical Requirement requires provision of certain information and requires updates to that information, the verification mechanism must include confirmation that the information has been provided and the information is valid at the time the evidence of compliance is submitted;
- where a Technical Requirement specifies how a test is to be performed, including where the location where the technical performance must be established is specified, the verification mechanism must ensure the tests are conducted in the required manner and include measurements that demonstrate the test has been conducted in required location;
- where a Technical Requirement is in relation to installation and/or availability of a control system or equipment, the verification mechanism must include confirmation that the relevant system or equipment has been installed and all required functionality is available continually;
- where a Technical Requirement is in relation to the connection status of a Generating System (such as remaining in Continuous Uninterrupted Operation, or a requirement not to disconnect following a disturbance), the verification mechanism must include, whichever is applicable:
 - if the Generating System or equipment within the Generating System was disconnected, evidence to support that the disconnection was intentional and in compliance with an approved protection scheme;
 - evidence that a Generating System remains connected during a disturbance; and
 - confirmation of relevant in-service protection settings;
- where a requirement is in relation to obligation of AEMO and/or a Network Operator, and consideration that must be made during a negotiation process of Generator Performance Standards, a verification mechanism may not be applicable;
- where a requirement is in relation to conformance to a WEM Procedure, Technical Rules, Australian Standards or any internal standards, the verification mechanism must consider how the requirement is described in the relevant document; and
- in any case, consideration must be given to ensuring that the verification mechanism supports a compliance status being established conclusively.

Testing and Verification Mechanism: Frequency of testing

- Requirements:
 - Proposed frequency of testing/monitoring arrangements
 - How the frequency of testing should be reviewed.
- Procedure will contain guidance on frequencies AEMO determines are reasonable and appropriate

The frequency of testing and monitoring must consider factors such as:

- (a) the technology of the Generating System in relation to that performance standard;
- (b) past learnings/ experience with the specific Generating System, or the relevant parts of the Generating System;
- (c) industry experience with the particular generation technology;
- (d) manufacturer's advice, for example with respect to the particular model of equipment within a facility or system version; and
- (e) an assessment of the frequency required to provide reasonable assurance of compliance.

Template Generator Monitoring Plans

Evidence of
compliance

Retention of Records

- It has the meaning given in the WEM Procedure:
 - refers to information and/or data to demonstrate that the required tests and/or monitoring specified in the Generator Monitoring Plan have been successfully conducted and recorded
- An MP must provide 'evidence of compliance' per proposed date/time
- The period the evidence of compliance are applicable must be specified

Records related to Registered GPS & Generator Monitoring Plans

- Must be retained at all times for the period which an MP is responsible for a Generating System
- Must be in electronic form

Generator Monitoring Plans

Submission

Proposed Generator Monitoring Plan

- Submit after Registered GPS is in place
NOTE: Existing Generating Systems may submit prior to issue of Registered GPS
- May be submitted prior to commissioning
- Approval to Generate requires an approved GMP

Amendments to an **approved** Generator Monitoring Plan:

- Within 6 months after a new GPS takes effect
- Within 6 months after a change to Template Generator Monitoring Plan (3A.6.9)
- Within 5 Business Days after a small change during implementation
- Any parts of the approved GMP no longer valid
 - Notify as soon as practically possible
 - Submit an updated GMP within 20 business days

Generator Monitoring Plans

Assessment/Approval

Assessment/approval

- Requirements in WEM Rules
 - 1.41.12, 3A6.5, 3A.6.6 as applicable
- Requirements in Template Generator Monitoring Plan
 - Testing & monitoring regime, verification mechanism, frequency of testing

Assessment timeframe

- 30 Business Days (best endeavours)

Generator Monitoring Plans

Non-compliance

Reporting of non-compliance is well defined in WEM Rules

An MP must notify AEMO within 5 Business Days when compliance has been re-established.

Where an MP is requested to undertake a test:

- AEMO may propose tests
- AEMO to specify timeframe
- MP may propose alternative tests

Generator Monitoring Plans

Transitional arrangements

Transitional arrangements are well defined in WEM Rules

Requirements for requests for extension

- Reasons
- Expected time for submission
- Actions to take to complete submission

AEMO's consideration

- Status of Agreed GPS
- Risks to power system
- Complexity of GMP considering age & technology
- Number of GMPs requiring developing

GPS System Overview

| Data Flow | Sub-Area | Current State | Future State |
|---|-------------------------------|---|--|
| Provision of Data from Market Participant to AEMO | Content, Format & Validations | Similar information is currently provided directly to Western Power under the Technical Rules <i>Submissions to be made for:</i> | As prescribed by Chapter 3A of the proposed amending WEM Rules (e.g. Non Compliance Event and Rectification Plan) and WEM Procedure (e.g. GPS Monitoring Plan) |
| | Timing and Frequency | N/A | In accordance with Chapter 3A of the proposed amending WEM Rules |
| | UI | N/A | <i>Via:</i> Web form via AEMO Portal |
| | B2B API | N/A | N/A |
| Provision of Data from AEMO to Market Participant | Content & Format | N/A | As prescribed by Chapter 3A of the proposed amending WEM Rules |
| | Timing and Frequency | N/A | In accordance with Chapter 3A of the proposed amending WEM Rules |
| | UI | N/A | <i>GPS data to be:</i> Displayed via AEMO Portal |
| | B2B API | N/A | N/A |

Mock-up of Dashboard, Overview and Details Displays

Dashboard: Current activities under negotiation and requiring action

Overview: Summary view of all current and historic GPS records for a Facility

Details: Access to details associated with a type of GPS data (e.g. GPS, Monitoring Plan etc)

Participant

11/11/2020, 5:34:26 PM

NOTIFICATIONS

Notifications Participant

Facility Facility

WEM Rules Version 1 July 2020

From Date of Registration

Status Proposed (Draft)

Created by WPNTWK

Created Date 2020-11-11T09:34:27.8047188

20/11/2020, 6:43:21

GPS File GPS Template_v0.0.xlsx

Supporting Documents supporting documents.zip

| GPS Name ↓ | Facility | WEM Rules Version | From Date of Registration | Status | Actions |
|-------------------|----------|-------------------|---------------------------|--------|---------|
| No data available | | | | | |

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Submission Summary

| | GMP & Evidence of Compliance | Non-Compliance | Rectification Plan |
|-----------|--|----------------|--------------------|
| Format | Word format, with supporting docs | Web form (TBC) | |
| Mechanism | WEMS MPI (Feb 2021) & AEMO Portal (Oct 2022) | | |
| Reporting | WEMS MPI (Feb 2021) & AEMO Portal (Oct 2022) | | |

- Non-compliance submitted against Registered GPS criteria or GMP.
- Rectification plan to be linked to Non-compliance event

Questions

- Additional comments or questions can be provided to AEMO
 - WA.ETS@aemo.com.au
 - AEMO Contact – Clayton James