

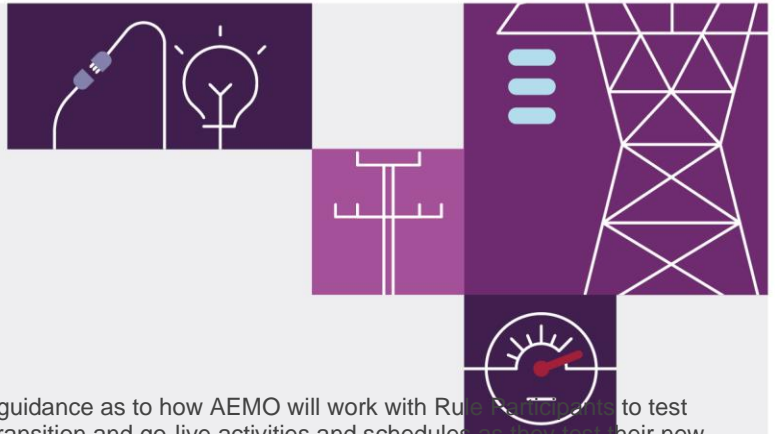
WEM Reform Program Industry Testing and Transition Strategy

February 2023

Version 1.0

Describes key elements of the approach to preparing for WEM Reform Go Live between AEMO and Rule Participants.





Important notice

Purpose

This publication has been prepared by AEMO to provide guidance as to how AEMO will work with Rule Participants to test interfacing systems, drill in key business processes and transition and go-live activities and schedules as they test their new and modified systems and processes and transition their operations from current market arrangements to the New WEM.

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Version control

| Version | Release date | Remarks / Changes |
|---------|--------------|---------------------------------------|
| #0.1 | 20/12/2022 | First draft for external consultation |
| 1.0 | 10/02/2023 | First official version |

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1. Introduction

This chapter provides background information on AEMO's WEM Reform program, and sets out the purpose, scope and approach to the development of this Industry Testing and Transition Strategy.

1.1 AEMO's WEM Reform program

The WEM Reform is AEMO's Program of work to deliver the Foundation Regulatory Framework part of the WA Government's broader Energy Transformation Strategy. The Program will deliver a new WEM that addresses today's security and market effectiveness challenges to shape a better energy future for Western Australia.

The WEM Reform Program implements a suite of new obligations on AEMO under the WEM Rules relating to:

- Security Constrained Economic Dispatch (SCED);
- Changes to the Reserve Capacity Mechanism to align with the introduction of constrained network access;
- Updated system planning processes; and
- Updated market administration and financial processes.

The Program is implementing these changes by means of a wide range of activities including:

- System enhancements and integration, including associated requirements analysis, design, build and testing activities.
- Developing and revising business processes
- Developing WEM Procedures and other documentation to elaborate new obligations and processes and support the use of new and modified systems.
- Testing, educating and practicing in these new systems and processes both internally and externally.

The SCED market will commence on the New WEM Commencement Day (NWCD, 1 October 2023)¹.

1.2 Purpose of the Industry Testing and Transition Strategy

The purpose of the Industry Testing and Transition Strategy is to set out a plan for managing, coordinating, monitoring and reporting on critical elements required for:

- Industry testing of standalone systems – Market Participant Test
- Industry scenario testing of integrated systems –referred to here as “Coordinated Market Trial”
- Evaluating market readiness to inform a Go-Live decision; and
- A safe and effective transition and cutover from existing to future systems and processes in the lead up to and immediately following the NWCD.

It is a high-level document that describes the external testing and transition approach for the entire WEM Reform Program. It will be supported by additional artifacts to be prepared in the lead up to the NWCD.

¹ The term New WEM Commencement Day (NWCD) defines the date when AEMO will cut-over from current Balancing Market to the new SCED Market, supported by the commencement of various regulatory provisions, at the same time. On 30 September 2021, the State Government announced that it will set the NWCD for 1 October 2023. The Minister is expected to Gazette this date around the same time as the Tranche 6 WEM Amending Rules (late 2022).

1.3 Related artifacts and activities

The Industry Testing and Transition Strategy is one of two strategy documents that support market readiness for the introduction of WEM Reform. Beneath each sits multiple activities and artifacts as illustrated by Figure 1 below.

Figure 1 Artifacts and activities supporting market readiness for WEM Reform

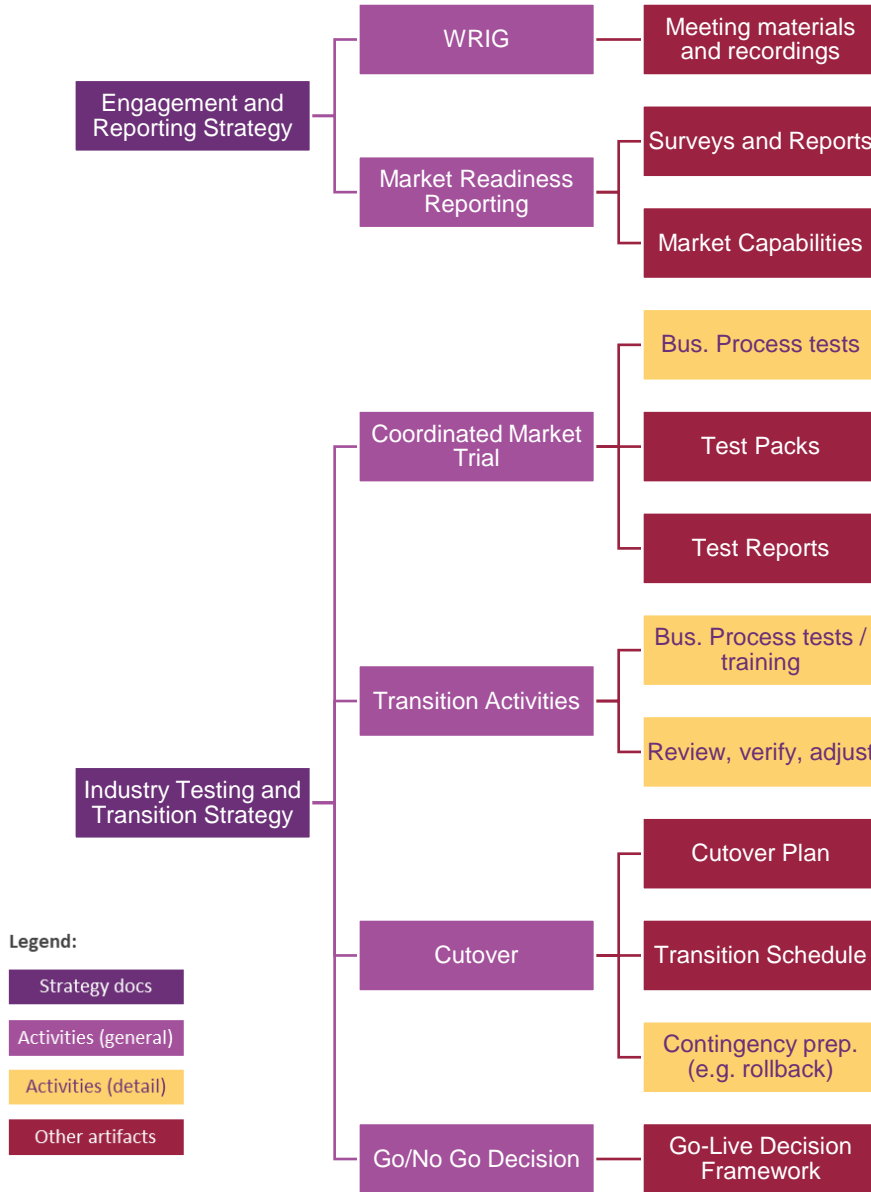


Table 1 shows how the Industry testing and transition strategy interrelates with other key WEM Reform market readiness documents.

Table 1 Summary of related documents

| Related document | Description of relationship |
|--|--|
| Market Readiness Engagement And Reporting Strategy | Sets out how Market Readiness is to be measured, progress against the Market go-live will be regularly reported and how stakeholders will understand how they will be engaged during the readiness process. The Market Readiness Engagement and Reporting Strategy has |



| Related document | Description of relationship |
|----------------------------|--|
| | undergone consultation with Market Participants and the current version is also published on our public website here . |
| Market Capabilities | Market capabilities describe what a given entity needs to know and/or be ready to do to successfully operate, support or participate in the new WEM at go-live and thereby meet their obligations under the revised WEM Rules. The Market Capabilities are a key reference used to standardise readiness reporting and to evaluate risks to readiness. The WEM Reform market capabilities are explained in this public consultation document here and dynamic lists of market capabilities are maintained on the Reformer SharePoint site here . |
| Test packs | Prior to the beginning of each phase of Coordinated Market Trial, AEMO will publish a Test Pack that will provide Rule Participants with a detailed plan and schedule for that phase, instructions for participation and one or more templates for reporting results. See Section 6.2.1 |
| Test reports | Test reports take a variety of forms for the purposes of this strategy. Participants will report status and outcomes from test events held during Coordinated Market Trial. AEMO will prepare a Test Summary Report that will report key outcomes and findings from the testing carried out during each Coordinated Market Trial phase. See Sections 6.2.3 and 6.4.3 |
| Transition Schedule | WEM Rules clause 1.56 requires AEMO to publish a Transition Schedule, subject to the approval from the Coordinator of Energy (clause partially reproduced below). The matters required to be covered in the Transition Schedule fall within the scope of this Industry Testing and Transition Strategy – namely the key operational activities required to transition to the New WEM. AEMO will prepare, seek approval for and publish this instrument in accordance with the WEM Rules. See Section 8.3.4 |
| Cutover Plan | The WEM Reform Cutover plan will lay out timings and dependencies for tasks associated with switching between current and future state systems and processes. It will also establish rules and guidance regarding completion, escalation and communication of cutover events. See Section 8.3.3. |
| Go Live Decision Framework | The Go-live decision framework set out how key Go-live decisions will be made, including the information inputs, evaluation principles, accountabilities and key contingencies. See Section 8.4. |

1.4 Audience

This Industry Testing and Transition Strategy is primarily intended for all WEM Rule Participants – including market participants and Western Power, as well as the Economic Regulation Authority (ERA)². These are the entities that will be directly affected by the changes implemented under the WEM Reform Program and each group has its own obligations to implement changes pursuant to amendments to the WEM Rules.

Unless explicitly limited, the obligations owed by and to “Rule Participants” in this Strategy, will also be owed by and to the ERA.

The intended audience for this document is particularly focussed on the following specialists within the above organisations:

- Developers and business and functional SMEs.
- Delivery managers.
- Test managers, leads and analysts.
- Project managers.
- Change controllers and managers.
- IT operations teams.
- Operations teams.

² Under the WEM Rules, the term “Rule Participants” encompasses Market Participants, Western Power as the Network Operator and AEMO as the Market and System Operator. All Rule Participants will be impacted by the WEM Reform Program and, hence, the readiness of all Rule Participants is within the scope of this Strategy. In addition, the Economic Regulation Authority (ERA) has important regulatory functions that will change as part of these reforms and the ERA’s readiness is also a matter of interest under this Strategy. The term Rule Participant will be used here for convenience, although it does not encompass the ERA for the purposes of the WEM Rules.



1.5 Living document

The Industry Testing and Transition Strategy will be a living document and AEMO anticipates issuing several updates as the industry approaches the NWCD. These updates will be issued by amending relevant chapters of this document and by publishing subordinate artifacts.

Stakeholders should note that the Industry Testing and Transition Strategy is advisory in nature. AEMO's approach to planning, coordinating and executing all elements of this Strategy are, and will remain, subject to change in light of considerations including:

- Hard constraints like the timely completion of systems or provision of data essential to carry out certain activities;
- AEMO's reprioritisation of activities in light of time or resource constraints;
- The availability and/or interest of other Rule Participants to take part in certain activities; and
- Flow-on implications of risk or issues identified by AEMO or other Rule Participants.

While AEMO reserves the right to adjust its approach as required, it intends to adhere to this Strategy as closely as possible and to communicate in a clear and timely way to other Rule Participants any changes in approach.

1.6 Comments

This version of the Industry Testing and Transition Strategy was the subject of consultation in December 2022 and January 2023. Although the Strategy is already live, AEMO welcomes comment on our approach at any time. Please email your comments, markups or suggestions to: wa.ets@aemo.com.au, subject: Industry Testing and Transition Strategy.

2. Framework

This chapter establishes the framework for the Industry Testing and Transition Strategy by setting out the strategy's objective, scope and principles.

2.1 Industry Testing and Transition Strategy objective

“Industry testing and transition” refers to the processes by which AEMO and Rule Participants work together to ensure:

- new and modified systems developed for the New WEM are demonstrated to interface correctly;
- each has established aligned and appropriate, internal processes; and
- a systematic transition towards applying these new systems and processes in operation within the New WEM.

Accordingly, the objectives for this Industry Testing and Transition Strategy are to:

- describe how AEMO will work with Rule Participants to:
 - test interfacing systems;
 - practice key business processes; and
- plan, schedule and coordinate key transition and cutover activities required to transition from current market arrangements to the New WEM.

These objectives support, and are consistent with, the market readiness objective set out in the WEM Reform Market Readiness Reporting and Engagement Strategy³.

2.2 Industry Testing and Transition Strategy scope

The scope of the Industry Testing and Transition Strategy includes:

- AEMO and Rule Participant IT system implementations required to operate the NEW WEM.
- B2B processes that are directly impacted by WEM Reform, such as coordination and communication protocols and processes between AEMO and Western Power.
- Registration and standing data updates required as a result of the New WEM Rules, such as facility class, FCESS accreditation status.
- Data migration of existing data from legacy to upgraded market platforms⁴.
- Development of Cutover Plans and cutover migrations.
- Contingency planning.

Please refer to the hierarchy of artifacts and list of related documents set out in the previous chapter (Section 1.3)

³ AEMO (2022) Reform Market Readiness Reporting and Engagement Strategy, available online at <https://aemo.com.au/-/media/files/initiatives/wem-reform-program/wem-reform-market-readiness-engagement--reporting-strategy.pdf?la=en&hash=47D42069138181C1ED4AF54BE9773DA0>

⁴ Note that this may not apply to many of the systems being deployed, which are both completely new systems and implement novel constructs.

2.3 Industry testing and transition principles

The following principles will underpin this strategy and support its objective. They will also support the overarching market readiness objective.

1. Mandated NWCD should be met

Transition activities should be planned and executed in a way that supports AEMO and Rule Participants meeting the mandated NWCD (1/10/2023). This includes providing market systems capability sufficiently far ahead that essential activities can be completed by the commencement date. Applying this principle may require some individual entities to adjust their transition approaches to ensure that all are able to meet key obligations.

2. WEM operations should be uninterrupted during periods of transition and go-live

The Industry Testing and Transition Strategy should be designed and implemented in a way that minimises risks to the operation of the WEM and the SWIS during implementation and transition.

3. Rule participants to have opportunity to test interfaces ahead of External Integrated Scenario Testing

The Industry Testing and Transition Strategy must provide opportunities for Rule Participants to test user and system interfaces for standalone applications in a test environment. This opportunity should be afforded to Rule Participants prior to the commencement of integrated scenario testing, where the particular user or system interfaces will feature in the scenarios to be tested.

4. Rule participants to be able to test their systems across multiple interfaces and drill in critical business processes

The Industry Testing and Transition Strategy must coordinate testing event in which Rule Participants perform realistic operations as part of integrated testing scenarios. These events will see multiple new integrated systems receiving inputs from AEMO and Rule Participants in a coordinated way to simulate a range of critical business processes under a range of scenarios. These events should support both system testing and practising operational processes.

5. AEMO and Rule participants to be transparent about testing participation and results

Due to the mutual dependency of AEMO and all Rule Participants for a successful outcome from WEM Reform, all entities should be transparent regarding what testing activities they have participated in, what functionalities and internal processes have been confirmed and what remains in doubt. This transparency should be reflected in all parties faithfully reporting progress and status against relevant Market Capabilities and completing test reports where requested. It also requires AEMO to provide the market with timely information on the outcome of performance tests related to market-interfacing systems.

6. Participants and AEMO are responsible for their own readiness

AEMO cannot and does not assume responsibility for participant readiness, including participant testing, cutover and transition activities. The Industry Testing and Transition Strategy provides an opportunity for all Rule Participants, including AEMO, to align their efforts and approaches to test systems and processes and to plan and execute their respective cutovers and transition activities. Aligning their own readiness work programs to this strategy should afford rules participants increased confidence in their own preparedness for WEM Reform.

3. Scope of Industry Testing

3.1 Testing basic interfaces

WEM Reform is creating new user interfaces, new APIs and will be publishing new reports to the Public Data Site. Rule participants need to test and confirm their ability to use these methods for providing and receiving information to/from AEMO. AEMO will continue to provide opportunities for participants to test new interfaces as early as possible and without waiting for the systems providing these interfaces to be integrated with other systems (see Section 5). AEMO wants Rule Participants to test and confirm their ability to use these interfaces before they participate in testing multi-step business processes – discussed in the following section.

3.2 Testing Business Processes

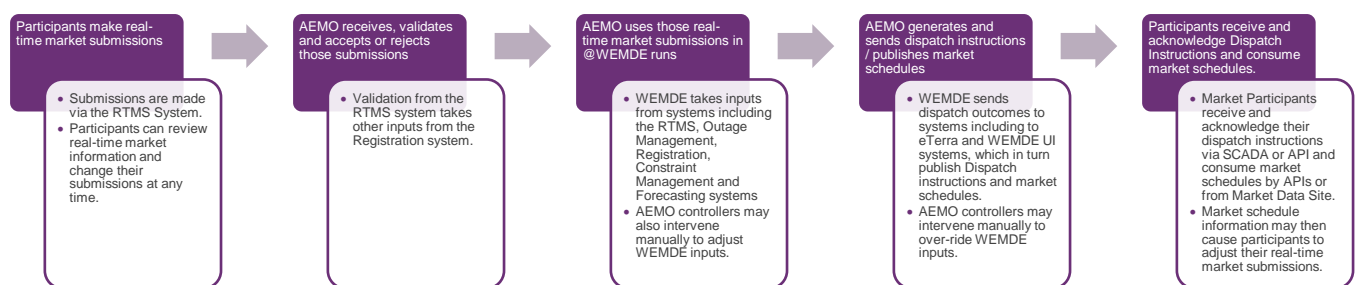
The suite of new systems to be deployed as part of WEM Reform provide functionalities that support broader business processes. Ultimately, it is the ability of AEMO and Rule Participants to effectively carry out these business processes that must be tested and confirmed prior to going live.

3.2.1 Integrated testing to be based on business processes

This Strategy approaches system testing from the starting point that systems form part of broader business processes that involve some combination of systems and human judgement/actions to achieve a particular outcome. That is, testing during Coordinated Market Trial (and during the Transition Period that follows) should encompass integrated systems and the human interactions with those systems that complete those processes. It must also encompass both internal and external interactions to the extent necessary and feasible.

For example, a basic version of the dispatch business process may involve the following operations. AEMO will design scenarios for Coordinated Market Trial that encompass and simulate as many of these operations as possible.

Figure 2 Simplified steps in the dispatch business process.



AEMO has identified a set of business processes that it considers must be tested with Rule Participants during the Coordinated Market Trial phase. AEMO's intention is that this will simultaneously provide opportunities for Rule Participants and AEMO to test integrated systems as well as have staff train and practice in using those systems to carry out their respective roles for a given business process.

3.2.2 Set of business processes to be tested

AEMO intends to test seven business processes with Rule Participants during Coordinated Market Trial (see Section 6), with multiple scenarios to be defined for each business process, reflecting different combinations of conditions, events and actions. Table 2 below summarises the 7 business processes, the objectives for testing each process and an indication of the scenarios that AEMO proposes for testing each business process.

Table 2 Business processes to be tested during Coordinated Market Trial

| Ref | Summary | Testing Objectives | Scenarios |
|------|---|---|---|
| BP 1 | RTM Submissions to Dispatch Instructions: RTM Submissions, view outcomes in dispatch schedules and receive Dispatch Instructions | <ul style="list-style-type: none"> Confirm consumption of information within dispatch schedules to inform RTM Submission. Validate Market Participants' capability to make and adjust its RTM submission while keeping several variables mostly static as an introduction to how SCED differs from Balancing Ensure AEMO can collect, process and use RTM submissions in WEMDE runs Develop an understanding of how quantities and prices in RTM submissions affect dispatch outcomes. | <ul style="list-style-type: none"> Varying the load profile (FOD) Varying FCESS requirements Varying facility's FCESS accreditation values Introduction of new Facilities entering the market and existing facilities exiting the market |
| BP 2 | Facility and Network Outages: RTM Submissions, Facility & Network Outages, view outcomes in dispatch schedules and receive Dispatch Instructions | <ul style="list-style-type: none"> Validate Market Participant and Network operator capability to submit Outage Plan. Consumption of Outage data and dispatch outcomes to inform RTM Submission Validate Market Participants' capability to adjust its RTM submission to reflect available capacity Ensure AEMO can collect, process and use RTM submissions in WEMDE runs Develop an understanding of how available capacity impacts dispatch outcomes. | <ul style="list-style-type: none"> Understanding RTM Submission obligations after Generator Outage Plan Submission, Withdrawal and Revision Network Operator Submits, Withdraw and Revise Network outage Network Outage starts early, starts late, finishes early, finishes late |
| BP 3 | Other Network Constraints: RTM Submissions, Network constraints (manually invoked), view outcomes in dispatch schedules and receive Dispatch Instructions | <ul style="list-style-type: none"> Validate Market Participants' capability to make its RTM submission following invocation of network constraint Simulate Credible Contingency Events (inc credible contingency reclassification) Ensure AEMO can collect, process and use RTM submissions in WEMDE runs Develop an understanding of the impacts which network constraints can have on dispatch outcomes. | <ul style="list-style-type: none"> Likely contingency events Credible Contingency Reclassification events |
| BP 4 | Commissioning Test Plans: Submit commissioning test plan, update RTM Submissions, view outcomes dispatch schedules and receive Dispatch Instructions | <ul style="list-style-type: none"> Validate Market Participants' capability to reflect an approved Commissioning Test Plan in a RTM submission Consumption of CTP data by other participants to inform RTM Submission Ensure AEMO can collect, process and use RTM submissions in WEMDE runs Develop an understanding of expected dispatch outcomes where a facility is undergoing commissioning. | <ul style="list-style-type: none"> Submit, Withdraw and modify CTP |
| BP 5 | Low Reserve Condition (LRC) Declarations and Intervention Events: LRC Declarations to elicit MP response and Intervention events to direct MP responses | <ul style="list-style-type: none"> Familiarise consumption of Dispatch Advisory updates to outages in real time Validate expected behaviour by Market Participants after AEMO issues a LRC notification or AEMO Direction following an AEMO Intervention Event via Market Advisory Validate Market Participants' capability to adjust its RTM submission to address shortfall (energy and/or ESS) or other issue identified in LRC Notification / AEMO Direction AEMO to issue Intervention Constraint to manage the AEMO Intervention Event Ensure AEMO can collect, process and use RTM submissions in WEMDE runs Develop an understanding LRC Declaration / AEMO Intervention processes and related dispatch outcomes. | <ul style="list-style-type: none"> LRC notification: FOD / ESS Shortage AEMO Intervention Process Directions to synchronise Outage Recall / Rejection |
| BP 6 | STEM and the RTM: Understand PD dispatch outcomes to inform STEM submission. Reflect STEM outcomes in RTM submission | <ul style="list-style-type: none"> Familiarise with changes to STEM submission content and timelines Simulate process to align STEM submissions with PD outcomes Simulate process to align STEM outcomes in RTM Submissions. | <ul style="list-style-type: none"> TBC |

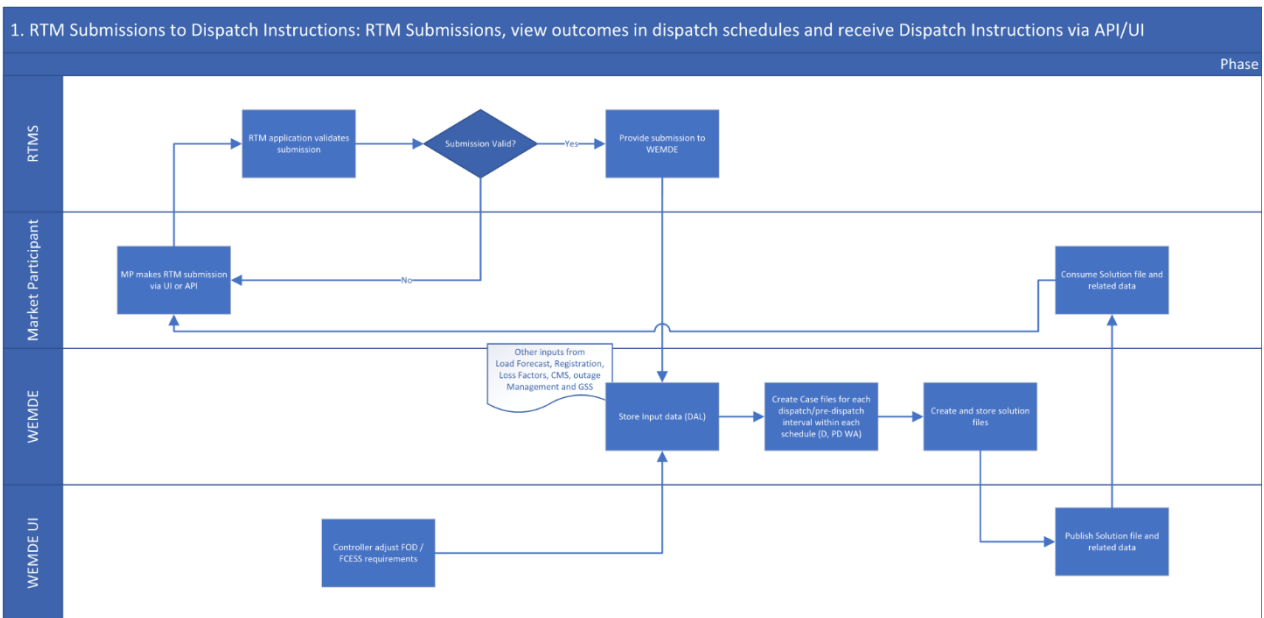


| Ref | Summary | Testing Objectives | Scenarios |
|------|---|--|---|
| BP 7 | DSP Dispatch: Manual Dispatch of DSPs, Offset FOD, view outcomes dispatch schedules and receive Dispatch Instructions | <ul style="list-style-type: none"> Simulate AEMO dispatching DSPs and FOD adjustment. Simulate DSPs responding to Market Advisory and updating RTM Submission Ensure AEMO can collect, process and use RTM submissions in WEMDE runs Develop an understanding of how DSP dispatch affects dispatch outcomes. | <ul style="list-style-type: none"> Dispatched DSP follows DI Dispatched DSP doesn't follow DI |

Source: [Coordinated Market Trial Business Processes - Detailed scenarios](#)

To support its own testing and readiness activities AEMO is developing business process diagrams to elaborate system to system and tease apart different role interactions across each business process – see example in Figure 3. AEMO will include a complete set of business process diagrams as part of the test packs we publish in advance of each phase of Coordinated Market Trial.

Figure 3 Example process swim lane diagram for Business Process 1.



Source: [Business Process - Process Maps.vsd](#)

3.3 Testing Non-Functional Requirements

3.3.1 Security testing

AEMO will carry out appropriate penetration testing prior to releasing systems into externally exposed environments. This shouldn't affect other Rule Participants, but it is a necessary step that must be accommodated within AEMO's release schedules.

All Rule Participants are responsible for their own cyber security and special obligations accrue to all participants in the electricity sector under the Security Legislation Amendment (Critical Infrastructure Protection) Act 2022. Rule Participants should ensure they understand their obligations under this legislation and consider its implications for any system changes they are implementing in response to the WEM Reform Program. AEMO delivered a short presentation in May 2022 to the WRIG-IT group explaining the relationship between the Framework and WEM Reform⁵. Further information and tools are provided under the [Australian Energy Sector Cyber Security Framework \(AESCSF\)](#).

⁵ WRIG-IT No.13, 12 May 2022, available via the Reformer SharePoint site here: <https://aemocloud.sharepoint.com/sites/EXT-COM-REF/SitePages/WRIG-IT.aspx>.

3.3.2 Performance testing

Giving participants confidence in system performance

Participants need to be confident that the new systems will meet reasonable performance standards in terms of availability and response times. Participants have stressed that AEMO should be transparent regarding the performance of our systems and that we should provide clear statements regarding the performance parameters that participants should factor into their system development and configuration. Participants want this information as early as possible.

In addition to performance testing systems, as appropriate, during development, AEMO will performance test systems prior to releasing them into Coordinated Market Trial. This performance testing will include capacity testing external interfaces with simulated high-traffic levels occurring simultaneously across multiple API endpoints. AEMO will share the parameters of any capacity tests carried out as part of non-functional testing and share with participants the results of our capacity tests.

Rate limits

Our performance testing may identify changes that AEMO must implement to improve performance (such as scaling up system resources) and it will also inform how we configure API rate limits. AEMO will commence Coordinated Market Trial with preliminary API rate limit configurations and will seek feedback from participants on these as part of participant reporting during or shortly after Coordinated Market Trial. AEMO may adjust API rate limit configurations following Coordinated Market Trial and will advise participants and update our documentation accordingly.

4. Industry Testing Overview


AEMO and Rule Participants are responsible for testing their own systems and processes to ensure these meet their respective regulatory and business requirements. However, AEMO's systems provide the platform for Rule Participants to carry out many of their functions and thus it is essential that AEMO provide the means for Rule Participants to test their ability to interface with this platform. This Section sets out the critical elements of the framework for Rule Participants to test and demonstrate their systems against AEMO's.

4.1 Summary of industry testing obligations

The following obligations or commitments underpin AEMO's approach to industry testing.

- AEMO will provide and maintain three environments which will be used for the various stages of testing by Rule Participants – these environments are:
 - MPT – the environment used for Market Participant Test, used to test standalone applications only;
 - MKT – the environment used for Coordinated Market Trial to be used to test integrated applications; and
 - PPD – a pre-production environment hosting a complete suite⁶ of integrated systems to be used during the Transition Period.
- Relevant procedures and technical specification changes will be documented and published via the Reformer or AEMO's public website prior to the commencement of external test windows.
- AEMO will use production-like data wherever possible and will provide information on relevant data states as part of briefings provided prior to running scenarios in Coordinated Market Trial phases.
- AEMO will perform the appropriate level of testing prior to new releases into the above environments, but this level of testing will differ, depending on the environment and application in question. Specifically, AEMO plans to:
 - perform functional testing
 - of standalone systems, prior to releasing to MPT
 - of integrated systems, prior to releasing to MKT or PPD
 - perform non-functional testing:
 - only partially, prior to releasing to MPT (e.g. penetration testing is essential, performance testing may not be)
 - to the fullest extent possible, prior to releasing to MKT (e.g. allowing for timing constraints)
 - completely, prior to releasing to PPD.
- AEMO will maintain resources on the Reformer website to support participants to prepare for and successfully execute tests in Coordinated Market Trial (see [Coordinated Market Trial \(sharepoint.com\)](#)).
- Rule Participants will inform themselves about relevant participation requirements as detailed in the communications provided prior to test events.

⁶ There will not be pre-production versions of certain elements such as the SCADA system, consistent with the scope of AEMO's pre-production WEM environment today.

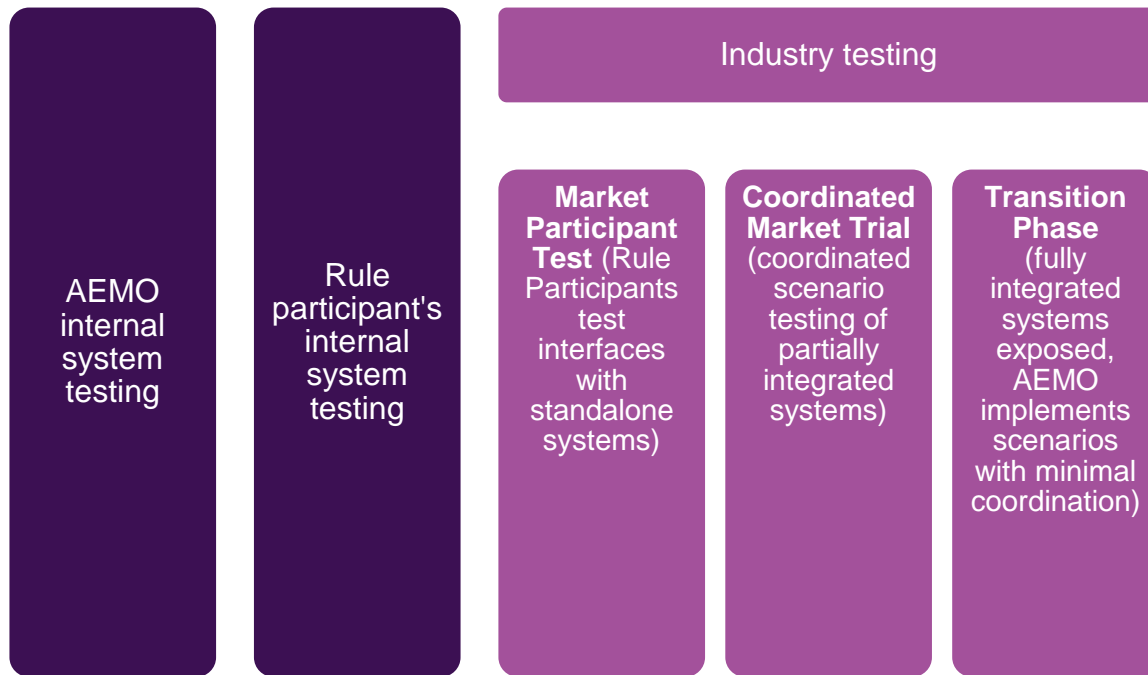
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- Rule Participants will perform internal testing and testing against relevant system interfaces in the MPT environment, prior to participating in Coordinated Market Trial and prior to performing operations in either MKT or PPD environments.
 - Rule Participants will have appropriately skilled resource capability for execution and support requirements during all stages of market testing.
 - Rule Participants will ensure that the appropriate access to AEMO's three testing environment is in place to support their testing requirements. AEMO will support participants resolve issues in getting access to these environments.
 - Rule Participants will ensure that:
 - data that needs to be pre-loaded by AEMO for a given scenario is prepared and provided to AEMO in a timely way (e.g. where a participant wants to test modified standing data as part of a given scenario)
 - Instructions are available to their own testing resources (such as submissions, outage plans, etc) and
 - that data submitted into or consumed from AEMO's systems is backed up (to the extent they are considered valuable to the participant).
 - All parties participating in Coordinated Market Trials will use PractiTest⁷ to:
 - execute test cases and log results
 - undertake defect management
 - view testing results.

4.2 Stages of Industry Testing

This strategy contemplates three categories of testing: testing AEMO's internal system, testing participants internal systems and finally industry testing – which contemplates testing the interactions between AEMO and participants systems. We further identify three stages of industry testing, involving progressively more complete systems and focussed increasingly on the demonstration that integrated systems and processes work correctly together smoothly and predictably executing business processes and market outcomes (see Figure 4). Shown in Figure 4 are the internal testing activities of both AEMO and other Rule Participants, as well as the three stages of industry testing, that are a focus of this Strategy.

⁷ See Section 6.4 for more detail on the proposed use of PractiTest.

Figure 4 Categories of testing and the three stages of Industry testing



The industry testing stages and AEMO’s preliminary view on how Rule Participants are to be coordinated at each stage are summarised in Table 3.

Table 3 Industry testing stages

| Industry testing Stage | Description | Coordination of Rule Participants |
|--------------------------|---|---|
| Market Participant Test | Unintegrated, standalone applications available for Rule Participants to test isolated business processes and support system builds. | Minimal – provision access; provide information and support. |
| Coordinated Market Trial | Partially integrated applications (building progressively) where AEMO facilitates co-ordinated testing of defined business processes with Rule Participants to confirm applications meet participant requirements and support system builds | Extensive – provision access; impose entry requirements; issue playbooks; tightly schedule; brief; debrief; monitor. |
| Transition period | AEMO to establish a fully integrated suite of systems, that will be used to simulate partial “parallel operations” ⁸ and thus support drills and practice business processes as well per AEMO-identified priorities, prior to go-live. During this Transition period, Rule Participants would be able to perform realistic operations and observe results. Details of how AEMO proposes to use this time and the limited system resource available remain to be determined | Moderate - provision access; impose entry requirements; issue guidelines (potential); schedule; brief; monitor. |

See Appendix A2 for details of the environments associated with each stage.

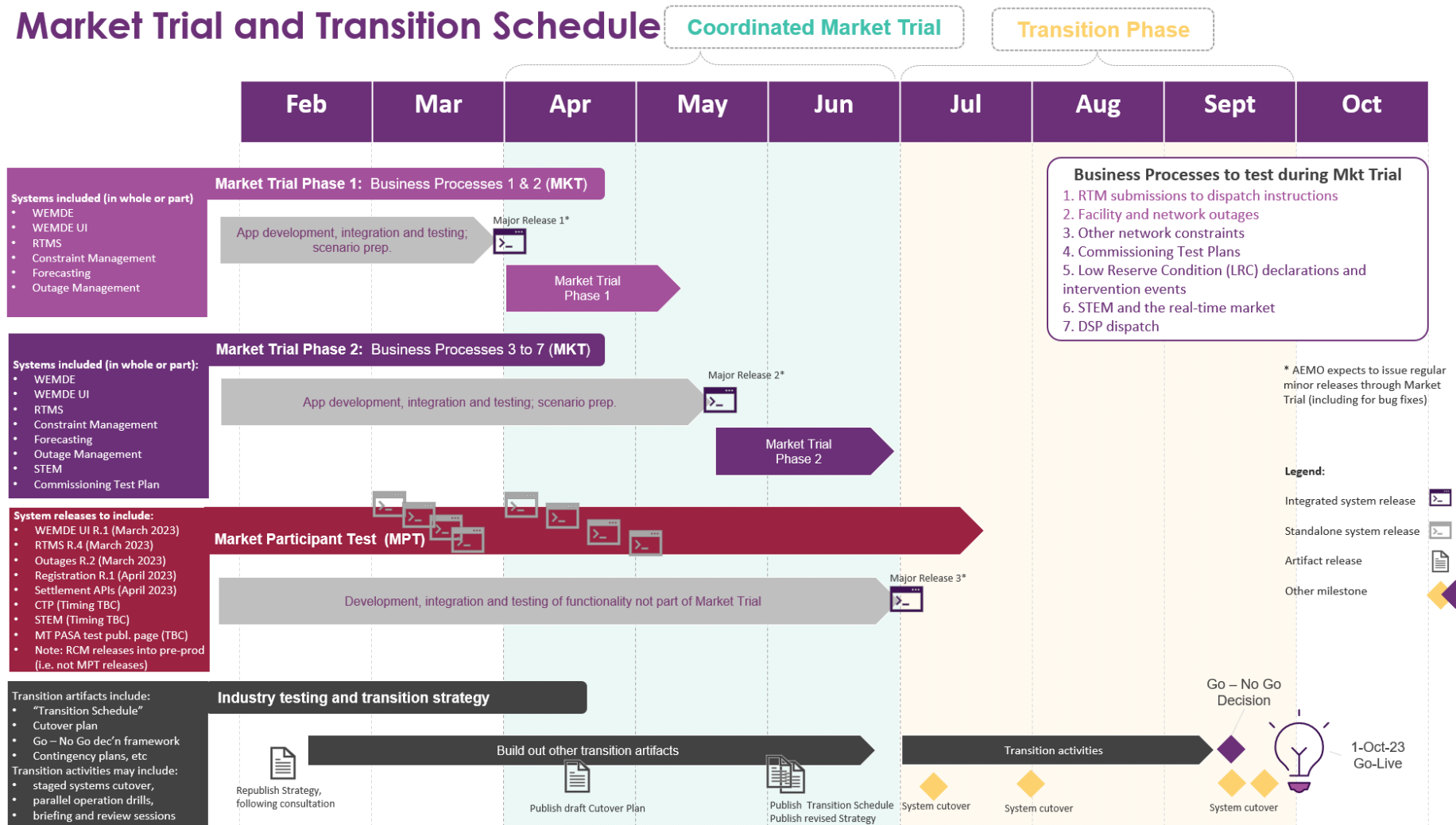
4.3 High-level schedule

The high-level schedule for all industry testing and transition activities is summarised in the figure below.

⁸ It may not be possible to establish full parallel operations in practice due to the complexity of certain key elements, such as: mocking the SCADA system and facility dispatch, mocking metering data and the resources required to emulate full control room and other operational functions.

Figure 5 High-Level schedule for industry testing and transition

Market Trial and Transition Schedule



Footnote [Diagrams - Coordinated Market Trial and Transition Strategy.pptx](#) (last updated 08.02.2023)

5. Industry Testing: Market Participant Test

5.1 Overview

Several Market Participant Tests have already been carried out in – namely Releases 1, 2 and 3 of the Real-Time Market Submission system (February and Sept 2022 and January 2023 respectively) and Release 1 of the Outage Management system (June 2022). AEMO will continue to run these test events in much the same way as participants will have observed for the previous instances. The key features of Market Participant Test releases are summarised in the table below.

Table 4 Key aspects of industry testing for Market Participant Test releases

| Attribute | Details |
|---|--|
| Purpose | Market Participant Test releases provide an opportunity for Rule Participants to test their ability to interact with key market-facing systems as standalone applications. |
| Scope | The scope of functionalities to be tested with each Market Participant Test release is defined by each project, but may include interacting with UIs and/or APIs as well as other methods of publishing or communication. |
| Timing | For systems that will be required for Coordinated Market Trial, Market Participant Test releases (and participant testing against those releases) must occur well before the commencement of Coordinated Market Trial. For other externally-facing systems, the timing of Market Participant Test releases can be more flexible and may occur in parallel with Coordinated Market Trial. |
| Coordination | The tests are not coordinated, meaning participants can test the functionalities of interest to them at their own pace. |
| Communication | Tests are communicated to Rule Participants by means of: <ul style="list-style-type: none">• Announcements and testing overviews provided at WRIG;• News items posted on the Reformer and news digests circulated by email to anyone on the WRIG mailing list. |
| Link to Coordinated Market Trial entry criteria | <ul style="list-style-type: none">• Coordinated Market Trial participants will need to have the ability to use each participant-facing system involved in the relevant Coordinated Market Trial phase.• PractiTest test sets are expected to include component test instances that are consistent with the types of operations that participants would be expected to have performed in MPT prior to participating in Coordinated Market Trial. |
| Environment | For more information regarding our testing environment, see Appendix A2 |

5.2 Scheduled Releases

AEMO's preliminary plans for MPT releases are shown below. Table 5 shows the approximate date for each MPT release and indicates the high-level scope of each test opportunity, which may include testing:

- the user interface;
- one or more submission endpoints;
- one or more reporting endpoints; and/or

As of February 2023, AEMO believes that it will not be able to include a mock market data site as part of the releases listed in Table 5 in order to demonstrate the publishing of files to that site. AEMO is not yet able to confirm whether it will be able to provide an opportunity to test this functionality in advance of Go Live.

Table 5 MPT releases

| Project | Approx Date | Functionalities to be tested | | | |
|-----------------------------|-----------------------------------|------------------------------|-----------|------------|-------------|
| | | UI | API Sub'n | API report | Web publish |
| RTMS (R.1) | Feb 2022 | ✓ | ✓ | ✓ | ⊗ |
| RTMS (R.2) | Sept 2022 | ✓ | ✓ | ✓ | ⊗ |
| RTMS (R.3) | Jan 2023 | ✓ | ✓ | ✓ | ⊗ |
| WEMDE UI (R.1) | Mar 2023 | ⊗ | ✓ | ✓ | ⊗ |
| RTMS (R.4 = R.3 + APIM) | Mar 2023 | | | | |
| Outage Management | Mar 2023 | ✓ | ✓ | ✓ | ⊗ |
| Registration | April 2023 | ✓ | ⊗ | ⊗ | ⊗ |
| Commissioning Test Plan | TBC | ✓ | ⊗ | ⊗ | ⊗ |
| STEM | TBC | ✓ | ✓ | ✓ | ⊗ |
| Settlements | April 2023 | ✓ | ✓ | ✓ | ⊗ |
| ST PASA and MT PASA Reports | Unconfirmed – not before May 2023 | ⊗ | ⊗ | ⊗ | TBC |

These releases will be supported with briefing session where possible and news articles on the Reformer and emails circulated from the wa.ets@aemo.com.au inbox.

The MPT release schedule has been delayed and compressed relative to earlier forecasts due to delays in integrating the API Management layer with AEMO’s legacy systems. AEMO acknowledges that this delay leaves participants with less time to prepare their systems and trouble-shoot standalone interfaces prior to the start of Coordinated Market Trial – a constraint AEMO will strive to accommodate during that next phase of Industry Testing.

5.3 The meaning of “Market Trial”

The term Market Trial has long been used in the WEM wherever AEMO makes system changes that require testing by Market Participants. Whenever a new release was placed into a pre-production environment for Market Participants to try out a user interface or test an API – this was referred to as a Market Trial. This is different to the concept described in this Strategy with the phrase “Coordinated Market Trial” – see Section 6.

Some of the system changes being implemented under the WEM Reform Program are not tightly coupled to the 1 October 2023 go-live date and are not dependent on other systems being developed under the Program. The system changes required for RCM Phase 1 and the new Generator Performance Standards (GPS) system changes are the main examples to date. In these instances, the first and only opportunity for participants to test the new releases was when they were deployed to AEMO’s pre-production environment for the WEM. These releases did not require coordinated participant testing – rather participants were simply provided with release notes and other documentation and left to make their own judgements as to whether and how they would test those releases in pre-production. In these instances, the phrase “Market Trial” has been used.

Looking ahead, the system changes required for RCM Phases 2 and 3 are similar to those past releases for RCM Phase 1 and GPS. Consequently, AEMO is only planning a single stage of participant testing for these system changes. For these releases, AEMO will continue to use the phrase “Market Trial” to refer to the pre-production testing window for these releases.

6. Industry Testing: Coordinated Market Trial

6.1 Overview

Table 6 Key aspects of industry testing during Coordinated Market Trial

| Attribute | Details |
|------------------------------------|---|
| Purpose | To provide for coordinated testing of defined business processes with Rule Participants to confirm applications meet participant requirements and to support participants testing their own systems and processes. |
| Scope | The seven business processes previously described in Table 2 and all associated scenarios. AEMO plans for Coordinated Market Trial to involve testing interconnected systems, as well as the human-executed steps required to complete a given business process. |
| Timing | April to June 2023 |
| Coordination | Extensively coordinated, with each testing event involving participants following a playbook according to a prior arranged schedule with reporting obligations in respect of each testing event. |
| Communication | Test information to be communicated to Rule Participants by means of test packs, frequent briefings and debriefings and dedicated Reformer resources. |
| Link to pre-production and Go-Live | AEMO cannot mandate participation in Coordinated Market Trial. Prior participation in Coordinated Market Trial will not be a pre-condition for Rule Participants to obtain access to the Pre-Production or Production environments. All Rule Participants will be strongly encouraged to take part in Coordinated Market Trial to ensure they are aware and informed of the changes that are being introduced through the New WEM. |
| Environment | For more information regarding our testing environment, see Appendix A2 |

6.2 Communication and coordination

AEMO and participants will need to carry out particular operations at defined times throughout the Coordinated Market Trial phase and special arrangements will be necessary to coordinate all parties reliably and efficiently.

6.2.1 Test packs

The primary resource for briefing and advising participants on how to participate in each Coordinated Market Trial event will be test packs. Test packs will be finalised two weeks prior to Coordinated Market Trial phases and will include materials addressing the requirements listed in the table below. AEMO envisages sharing elements of a test pack progressively – rather than issuing all elements simultaneously.

Table 7 Key requirements for Test Packs

| | |
|--------------|---|
| Context | testing objectives and summaries of the business processes to be tested |
| | process charts making individual roles within the business processes explicit |
| | scenario descriptions and parameters |
| Test events | a schedule of test events within the relevant phase |
| | each test "event" runs integrated systems on set assumptions, while participants execute test cases |
| | schedule will be subject to change with Outlook and the Reformer providing a dynamic schedule |
| Meetings | meeting cadence and format should be responsive to the business processes being tested |
| | AEMO to include meeting information in the schedule and provide a standing agenda |
| | requirements of attendees/participants to be articulated (who, preparatory tasks etc) |
| Test cases | sets of tests for participants to execute for a given testing event |
| | test cases will be documented in PractiTest |
| | each test event will involve predefined scenario parameters and a recommended set of tests |
| Registration | participants to register to take part in each phase of Market Trial |
| | confirm they satisfy entry criteria or "pre-requisites" for participation in the Market Trial phase |
| | pack may also list exit criteria for a participant to consider in self-evaluating readiness |
| Reporting | packs will list the test outcomes to be reported by each participant for each testing event |
| | AEMO considering options to manage through Excel template or PractiTest |
| | summary of results shared and discussed at the next meeting |

Each test pack is likely to be published as a hybrid artifact comprising items created or published using different media, including:

- PDF documents,
- SharePoint pages on the Reformer and
- content included within PractiTest (a test management tool discussed in Section 6.4).

6.2.2 Industry Testing Forum

Based on feedback from rule participants, AEMO will establish a dedicated forum called the Industry Testing Forum in March 2023. The Forum will provide AEMO and Rule Participants with an opportunity for communication and engagement on the technical implementation and execution of Coordinated Market Trial.

Administration


Rule Participants will be asked to nominate suitably experienced representatives to attend meetings of the Industry Testing Forum who are involved in their WEM Reform-related system development and testing programs. The Industry Testing Forum will be relatively informal and minutes will not be kept. Meetings will not be recorded as a rule, but AEMO may record specific meetings for later reference on the Reformer where the content is considered provide ongoing value – such as in the case of analysis provided around “controlled scenarios”⁹.

Forum agenda

Agenda items for meetings of the Industry Testing Forum will variously include:

- Walk through of test packs once published for Coordinated Market Trial releases 1 and 2.
- Addressing questions regarding Coordinated Market Trial administrative matters including
- Reviewing the status of test defects / issues

⁹ Controlled scenarios will involve AEMO making all submissions on behalf of participants to ensure the scenario plays out in a pre-predicted manner. For these scenarios, AEMO plans to provide additional analysis to help participants understand cause and effect in reviewing market inputs and outcomes that they will have been able to observe in the Coordinated Market Trial environment.

- 
- Reviewing scenarios (PractiTest “test instances”) ahead of time to ensure common understanding of:
 - scenario timelines
 - suitable parameters for participant submissions
 - reports for participants to query
 - Coordinating the test execution process
 - Reviewing short summaries of test outcomes
 - Reviewing analysis of “controlled scenarios”
 - Addressing participant non-compliance in test execution such as running behind test schedule, submitting outside guidelines, not reporting results.

Forum schedule

Meeting dates will be advertised on the Reformer site and meeting invitations will be scheduled by Microsoft Outlook. AEMO anticipates that the Industry Testing Forum will meet once or twice prior to the start of Coordinated Market Trial and then occur in a regular cadence for the duration of Market Trial. Forum meetings may be called at short notice, should circumstances demand it.

6.2.3 Reporting

Test outcomes to be reported by participants

After participating in each test event, participants will be asked to report the status of their testing of particular capabilities/ outcomes, selecting from a pre-defined menu, such as:

- Unexecuted
- In progress
- Blocked
- Failed
- Passed
- Not Applicable

See Section 6.4.3 discusses the PractiTest tool by which participants will be asked to use to report these results.

Metrics

Test measurement during Coordinated Market Trial will result in a limited number of simple metrics such as:

- Number of test scenarios executed versus the number planned
- Number of passed test scenarios versus test scenarios executed
- Number of failed test scenarios versus test scenarios executed
- Number of test scenarios deferred/not applicable versus number planned

AEMO will also consider options to scale results based on the facility capacity affected.

Test Summary Report

AEMO will produce an internal Test Summary Report at the end of each Coordinated Market Trial phase to be used for the purposes of determining whether to proceed to the next phase. This artefact could be shared directly with Coordinated Market Trial participants. As this approach would likely introduce additional review and approval steps (with impacts on timeliness and resourcing), AEMO favours sharing a targeted extract of the report, in order to convey the most relevant information as quickly as possible.

Linkage to Market Readiness Reporting

The results of participant testing within Coordinated Market Trial will provide valuable indications of participant readiness. The resulting insights will be narrower than the range of matters addressed in the Market Readiness Surveys, but more concrete and verifiable.

The information sought will generally be binary in nature – that is a participant will report whether a particular combination of system functionalities and human actions was tested and confirmed to work for a given scenario. This should make the results be less susceptible to subjective judgement and more reliable.

In addition to sharing results with Coordinated Market Trial participants via subsequent meetings and/or publishing aggregated data on the Reformer, AEMO will incorporate results into our Market Readiness Reports. We will also consider how this information should be considered within the Go-Live Decision Framework (see Section 8.4).

6.3 Entry and Exit Criteria

The entry and exit criteria for each Coordinated Market Trial phase will be defined in the relevant Test packs. Depending on the testing defined, the criteria are likely to be based on those listed below.

6.3.1 Entry criteria

AEMO and participants will be asked to complete and submit entry criteria checklists when registering for each Coordinated Market Trial phase. This may include, but is not limited to the following criteria:

- Interface testing of relevant systems has been completed in MPT (see Table 11).
- Participants internal testing and knowledge of their own systems is sufficiently well advanced to support effective participation in Coordinated Market Trial.
- Participant has registered PractiTest accounts issued by AEMO and relevant staff have reviewed the training materials and instructions provided by AEMO.
- Appropriately skilled resource is nominated and available to execute and support testing.

6.3.2 Exit criteria

AEMO will retain some flexibility in determining whether a given Coordinated Market Trial phase should be closed or be extended. AEMO is likely to consider the following criteria and reserves the right to consider other factors to be determined closer to the time.

- Successful completion of all high-priority test scenarios by sufficient Rule Participants.
- Whether any Priority 1 or Priority 2 defects have been identified but not resolved.
- The nature of other open defects (Priority 3 or 4) and any agreed resolutions or work arounds.

6.4 PractiTest test management tool

AEMO will use PractiTest with other Rule Participants for the purposes of setting out test cases, logging defects and reporting the status of tests.

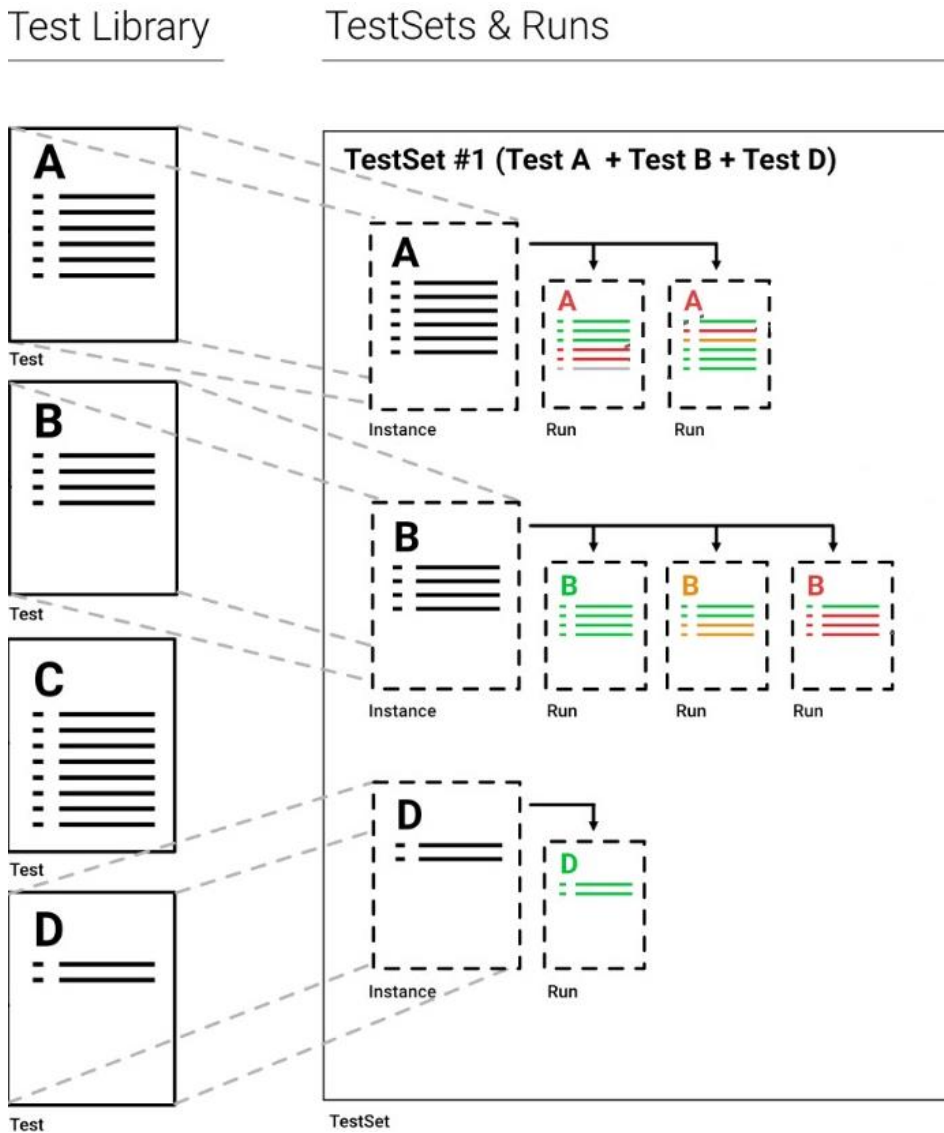
6.4.1 PractiTest for documenting test cases

AEMO will use PractiTest to communicate our test cases, which will describe sequences of steps for Rule Participants to execute in order to perform the key functions required for the completion of business processes (see Table 2).

In documenting test cases within PractiTest, AEMO will need to conform to the terminology and object hierarchy used within that package to describe our test cases. For instance, the phrase “test case” is not used in PractiTest. The figure below introduces the following PractiTest concepts, which are elaborated below.

- Tests
- Test Sets
- Instances (of Tests); and
- Runs

Figure 6 PractiTest Object Hierarchy




Source: PractiTest: [PractiTest Methodology and End-To-END Process - PractiTest](#).

A **Test** is a collection of steps to perform an operation at a lower level. E.g “use the user interface to make a real-time market submission”

A **Test Set** is a collection of tests, which, taken together, simulate the performance of a larger business process. For example, AEMO will represent the all the steps that participants must complete for the purposes of Business Process 1 as a Test Set¹⁰.

An **Instance** is a copy of a test, embedded within a Test Set.

¹⁰ Table 2 summarises Business Process 1 as follows: “RTM Submissions to Dispatch Instructions: RTM Submissions, view outcomes in dispatch schedules and receive Dispatch Instructions ”



A **Run** is a full execution of a test set. E.g. a participant may complete a Test Set early on Day 1 (Run 1), again later that day (Run 2), and again on Day 2 (Run 3). The participant controls when the execution of a given Run of a Test Set has concluded and AEMO will ask participants to follow good housekeeping roles to close out each Run in a timely way, and to initiate new Runs where indicated.

6.4.2 PractiTest for defect management

AEMO will use PractiTest as the exclusive platform by which participants in Coordinated Market Trial will be able to participate in defect management. Practitest will be configured by AEMO and details shared with participants to allow participants to log defects and track their resolution.

6.4.3 PractiTest for reporting

6.4.4 PractiTest will be the primary mechanism for participants to report outcomes from testing events. Provisioning and supporting PractiTest

AEMO will register two free accounts to each organisation. While these will be registered to a particular individual in each organisation, accounts may be shared between users within each organisation's project teams.

AEMO will support participants to use PractiTest by:

- running a short introductory session for Rule Participants to illustrate the tool and how it will be used; and
- publishing notes on how to use the tool for the purposes of the WEM Reform Program and links to training materials, via the Reformer.

While AEMO will provide the support above, ultimately it will be the responsibility of each Rule Participant to ensure that they can use the PractiTest tool.

6.5 Risk and Issues Register

AEMO established an industry risk register for WEM Reform, which is available on the [Reformer](#). The Program created the register to assist the Readiness Working Group (RWG) to identify and track industry-wide risks. However, AEMO discontinued separate RWG meetings in April 2022, as the forum generated limited feedback and engagement from most participants.

AEMO continues to maintain a risk and issues management process focussed on AEMO-controlled risks and mitigations and encourages participants to do likewise. Collectively managed risks will continue to be dealt with on a case by case basis – for instance through continued bi and tri-lateral coordination between Western Power, Synergy and AEMO.

6.6 Test data


6.6.1 Data required from participants

AEMO will be primarily responsible for generating test data in advance of Coordinated Market Trials. However, there will be some standing data that may need to be provided by participants in advance of each Coordinated Market Trial phase, such as:

- Registration standing data (must have); and
- RTM standing submissions (should have).

During Phase 1 of Market Trial, Registration data will continue to be provided by participants by means of a spreadsheet¹¹. AEMO is hoping to make the revised Registration system available for use in Market Trial Phase 2. If this is not achieved, AEMO will continue to employ the spreadsheet method.

¹¹ This interim spreadsheet solution will build on the standing data template already used by participants for RTMS test releases. We anticipate making this interim spreadsheet template available on the "[Technical Specifications and Guides](#)" page of the Reformer.



It is highly desirable to have all such data fully pre-populated prior to Coordinated Market Trial using data supplied by participants. AEMO may need to provision some systems with its own mock data where participants fail to provide it.

The balance of data required to be supplied by participants will be submitted “live” by participants during each test event. The test cases documented in PractiTest may provide guidance on the timing and form that such submissions should take (for instance guidelines on the RTMS price range or on the type of outage to submit, etc). Otherwise, participants will be free to determine what values they wish to submit – noting the interactions between validation rules, compliance obligations and the values participants choose.

Data requirements will be developed in the first quarter of 2023. At a high-level:

- Data requirements will be identified for each test scenario as part of the test scenario development. These data requirements will be detailed in the test packs
- Where data is required to be supplied by participants, this responsibility will be clearly called out in the test packs.
- Participants will be responsible for ensuring that any required data is available for test execution.

6.6.2 Data refresh

AEMO anticipates that it may undertake a data refresh at various times during the Coordinated Market Trial – for instance as part of a major release. The details of these will be discussed and communicated to participants in the lead up to each go live. Participants are encouraged to backup any data they maintain within that environment to avoid data loss and to maintain their own systems of version control, to the extent that their test data has any enduring value for them.

6.7 Test Events

Test events, which are distinct from test cases, are the pre-scheduled timeslots in which AEMO will run its integrated systems, having loaded a selected set of seed data. Seed data may include forecast operating demand, FCESS requirements and pre-loaded RTM standing submissions, among other data types.

6.7.1 Types of Test Events

AEMO will schedule two types of Test Events, active and controlled test events. Active test events will be the most frequent and most important type of Test Event, in which participants will be expected to execute test cases and report results. Due to the high frequency of active test events, AEMO won't be able to provide critical analysis of the market outcomes observed during these events. In lieu of this, AEMO expects to schedule some controlled test events, to be executed on a weekend day, for which we will ask participants to not make submissions at all. In this way, AEMO will be able to completely control all inputs and thus generate a pre-determined set of market outcomes that AEMO staff will subsequently present analysis on to assist participants in learning about basic market dynamics under the new arrangements.

6.7.2 Duration of Test Events

A Test Event formally covers the 24 hours between 8am of the day of the Test Event and 8am the following day. In practice, participants are expected to participate in the Test Event primarily during the hours of 10am to 2pm – the period termed the “Main Window” in the figure below. AEMO intends to schedule critical events during the Main Window– especially where an active response from participants is desired. Notwithstanding AEMO's intention to focus on this Main Window, 24 hour access to the systems will be maintained as much as possible.

6.7.3 Scheduling Test Events

AEMO will pre-schedule test events by creating appointments in MS Outlook, mirrored by events shown on the Reformer calendar. These event bookings will provide objects against which AEMO can associate scenarios (seed data) and test cases (Test Sets in PractiTest terms).

6.7.4 Associating test cases with Test Events

In the week prior to a given test event, AEMO will confirm the scenarios and test cases applicable to a given Test Event. Rule Participants will be expected to consult either the Outlook appointment or the Reformer calendar event to establish the test cases they should execute during that Test Event.

6.7.5 A typical week

The figure below shows the expected pattern for a week in Market Trial, comprising:

- Four pre-scheduled active test events Monday through Thursday
- A backup day on Friday that permits AEMO to rerun a scenario if required
- Scope to run a controlled test event on Saturday or Sunday
- Two confirmed meetings of the Industry Testing Forum (Monday and Wednesday mornings) and
- A placeholder meeting of the Forum on Fridays, if required.

Figure 7 A typical week of Test Events in Market Trial

| | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|-------------------|---|--------------------------------------|--------------------------------------|--------------------------------------|--|---|---|
| <i>Summary</i> | <i>Planned active scenario days</i> AEMO to schedule specified scenarios; active submissions by participants are expected. | | | | <i>Backup day - can repeat active scenarios if req'd</i> | <i>Controlled scenario days</i> Participants requested <u>not</u> to submit. Planned, but only used as required. | |
| Early morning | WEMDE "state" starts returning to reset point | | | | | | |
| 7:55:00 | WEMDE "state" has returned to the reset point | | | | | | |
| 8:00 | Scenario 1.01 dataset starts | Scenario 1.02 dataset starts | Scenario 1.03 dataset starts | Scenario 1.04 dataset starts | Repeated scenario dataset starts (if required) | Controlled Scenario 1.05 dataset starts (where scheduled) | Controlled Scenario 1.06 dataset starts (where scheduled) |
| 9:00 | Industry Testing Forum Meeting | | Industry Testing Forum Meeting | | Forum Meeting (scheduled, often cancelled) | | |
| 10:00 | Main window for Scenario 1.01 starts | Main window for Scenario 1.02 starts | Main window for Scenario 1.03 starts | Main window for Scenario 1.04 starts | Main window for Repeated Scenario starts | | |
| 10:00 to 14:00 | Main Window | | | | | No set window. AEMO will advise relevant intervals to observe. | |
| 14:00 | Main window for Scenario 1.01 ends | Main window for Scenario 1.02 ends | Main window for Scenario 1.03 ends | Main window for Scenario 1.04 ends | Main window for Repeated Scenario ends | | |
| 14:00 to midnight | WEMDE continues to run - "state" dependent on the scenario, AEMO to give no or minimal guidance on participant activities for this time of day. | | | | | | |

6.8 Defect management

Defect management approach

The objective of defect management is to resolve all defects within the project lifecycle. However, this objective must be balanced against other project objectives, such as achieving the schedule and the system impact and priority of the defect (discussed below). The acceptable level of defects within each stage of testing is typically defined as part of the 'exit criteria' for that stage.

AEMO will manage and report on defects identified during test execution. Where it is determined that it is not an AEMO defect, AEMO will coordinate with market participants to obtain the status of the defect.

Raising defects

Defects raised during Coordinated Market Trial will be captured in Practitest. AEMO will provide guidance on the information required to be submitted by a Rule Participant when raising a defect. The term "defect" is used broadly to include defects that would ordinarily fall outside of a narrow "IT" definition. For example.

- Information could be captured regarding lack of required support. This affects test execution from a timing perspective; and
- Testing may indicate that an automated business process needs manual intervention to work correctly and given constrained timings an automated fix cannot be developed and tested in time for go-live. Information such as this can feed into the deployment\Cutover Planning for go-live.

Defect triage

AEMO will perform a basic triage process once a defect is raised. Where it identifies that the defect rests with itself, it will rate the defect severity and will external advise timeframes to address critical and high priority defects (see Table 9). During Coordinated Market Trial other Rule Participants may identify high severity defects that require resolution prior to Go-Live. AEMO expects that participants will also use PractiTest to log defects.

Defect escalation

AEMO will establish an internal process for escalating critical and high priority defects (see Table 9). The process won't be directly observable to participants, but they will be able to track the progress of defect management (and assess its timeliness) by following the issue in PractiTest.

Defect prioritisation

Defects will first be classified according to severity (Table 8) and then assigned a priority classification, with a corresponding target timeframe for resolving the defect (Table 9). Severity reflects the significance of potential impacts on the system capability, Coordinated Market Trial execution and/or business processes in production. Priority will be determined by considering the value to AEMO and the market of a rapid resolution. Each priority classification will, of necessity, consider the relative significance of other defects and the resources and time remaining to address the defect.

Table 8 Defect severity classification

| Severity | Definition |
|-----------------|---|
| 1 - Showstopper | Defect is considered critical to business operations and/or testing. Core business and project impact. |
| 2 - Major | Defect is considered high impact to the business operations and/or testing. However, core business processes are still able to be completed (possibly via workarounds, etc.) and testing is still able to continue. |
| 3 - Moderate | Defect is considered moderate impact to the business operations and/or testing. Core business processes are unaffected, and testing is still able to continue. |
| 4 - Minor | Defect is considered low impact to the business operations and/or testing. Core business processes are unaffected, and testing is still able to continue. |

Table 9 Defect priority classification

| Priority | Target Resolution Time | Definition |
|--------------|------------------------|--|
| 1 - Critical | 24 Hours | Total loss of the system, infrastructure, or connectivity. Requires urgent fix. No testing can be performed without the defect being resolved |
| 2 - High | 48 Hours | Partial loss of the system, infrastructure, connectivity, or functionality. Requires urgent fix. Testing is severely impacted, and the system or infrastructure is prevented from moving to the production stage without the defect being fixed. |
| 3 - Moderate | 72 Hours | Minimal impacts (cosmetic) to the system function. Loss of the system but there is manual work around and has no business impact. Testing can proceed but an acceptable business work around must be documented and approved |
| 4 - Low | As advised | Minimal impacts (cosmetic) to the system function. No loss of the system and has no business impact. Testing can proceed but defect must be documented and approved |

Post triage and acceptance of a defect, a resolution date will be added in PractiTest.



Defect management status

AEMO will determine a set of defect management status values to be use in PractiTest, such as:

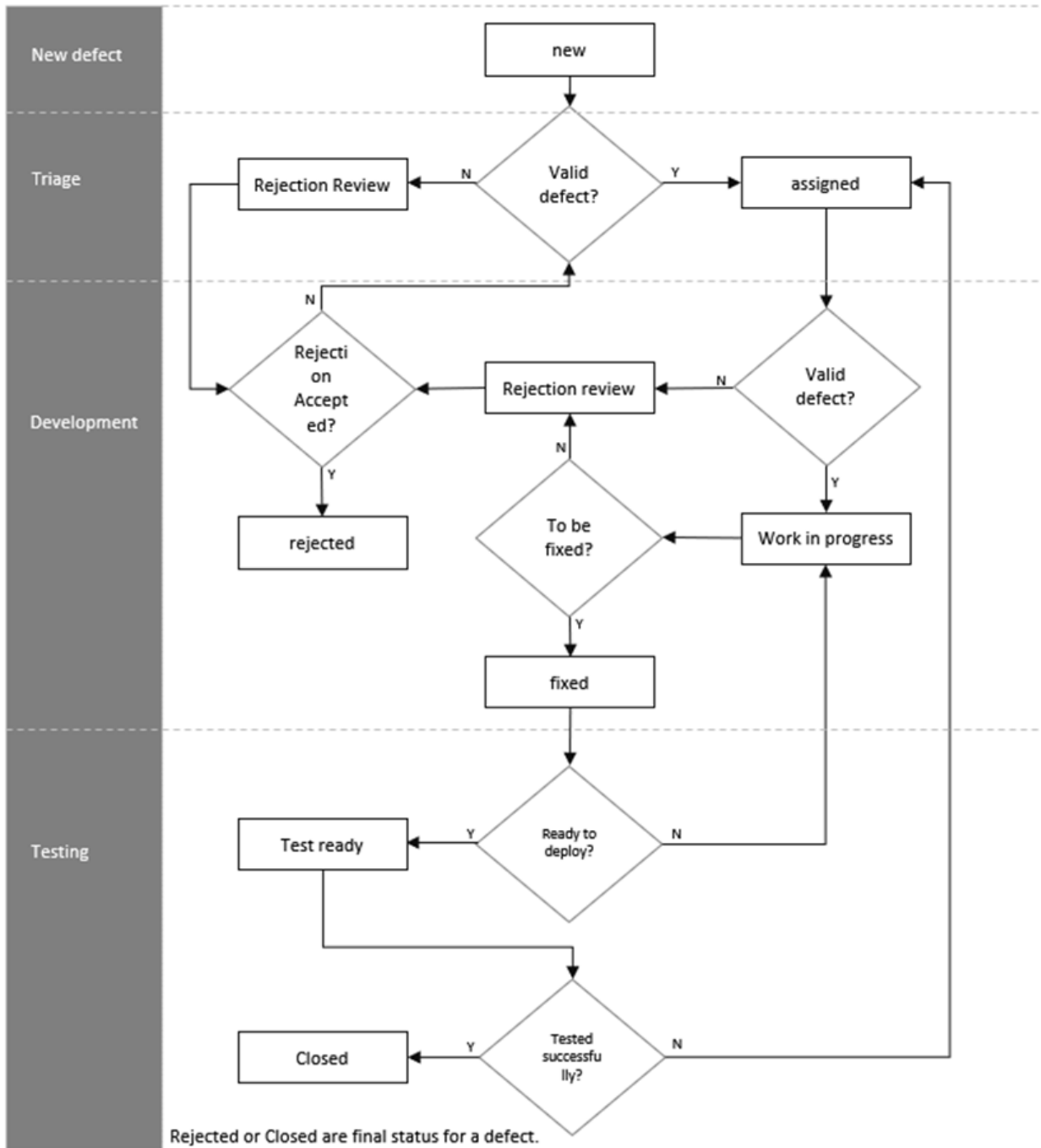
- New
- Assigned
- Work in Progress
- Rejected
- Fixed
- Test Ready
- Closed.

These will allow participants and AEMO alike to track the progress of defects within PractiTest. The adopted status values will be advised and defined in a future revision of this Strategy.

Defect process flow

Figure 8 below shows the defect management process throughout the various defect management statuses of the defect lifecycle from its inception through to its closure.

Figure 8 Defect life cycle



Defect root cause

Defect root cause will be updated in Practitest once the defect cause is identified. This will help with the defect metrics to identify the impacted area of the issues/defects identified in the testing. Table 10 defines the defect root cause values that can be assigned in PractiTest.

Table 10 Defect root cause values assignable within PractiTest

| Root Cause | Definition |
|------------|--|
| Design | The design of the process does not meet the requirements specified. Defect may include examples, algorithm (incorrect calculation), error handling, creation/release of object or memory, decision logic error, loop control, procedure call, failing to validate data values before being used. |

| Root Cause | Definition |
|-------------------------|---|
| Configuration | The intended outcome of the configuration is not meet. |
| Data | There are system data issues for the process that may prevent test completion. |
| Requirements | Unclear or incorrect requirement, Functional and Business specification documentation. |
| Infrastructure/Hardware | Defect is not in the object being tested but, in the test, set up, for example the wrong configuration or version control of platform, operating system, browser, hardware or networking, system is down, or the environment is down. |

6.9 Suspension of Coordinated Market Trial

During Coordinated Market Trial, AEMO may determine that scenario testing should be suspended and then determine when testing will continue. AEMO will make these judgements in consultation with participants. Suspension and resumption criteria and actions are described below.

6.9.1 Suspension criteria

Complete or partial suspension of testing may be required if:

- High volume of defects is open impacting the scenarios that can be executed
- High severity (i.e. showstopper) or combination of defects open
- Significant delay in the release of software (including defect fixes) to the MKT environment

6.9.2 Suspension decision and actions

If these circumstances arise, the following actions will be taken:

- AEMO will advise participants that it believes a suspension is appropriate, canvas their views and rapidly confirm whether to proceed with the suspension.
- AEMO will advise Rule Participants of the potential delays due to the test suspension, and the impact of defect / defects concerned
- AEMO will undertake and coordinate development and test efforts to resolve the defects raised and Rule Participants will support same.

6.9.3 Resumption criteria

Coordinated Market Trial will resume after the issues that caused the suspension have been resolved and/or suitable workarounds have been identified and put in place. At this point AEMO will:

- inform testing participants of:
 - the successful deployment of the defect fix(s); or
 - the nature of any workarounds and any actions required of participants
- inform testing participants of the new schedule for the resumption of scenario testing
- advise testing participants of the impact(s) of the defect fix on the previously executed test cases and suggest if any re-testing should be done.

6.10 Scheduled Releases

During Coordinated Market Trial AEMO plans two major integrated system releases into the Coordinated Market Trial environment, covering Phase 1 and Phase 2. AEMO also anticipates several minor releases (primarily to deploy defect fixes) and these will occur between major releases. AEMO's preliminary view of the timing of the major releases is shown below. Table 11 also shows which systems participants in a given Coordinated Market

Trial phase would be expected to be ready to interface with. Interface in this context could mean either by UI or API, according to each participant's planned interface methods once in production.

Table 11 Planned Coordinated Market Trial releases and required system interfaces

| Coordinated Market Trial Release | Coordinated Market Trial Phase | Release date | Systems participants required to interface with | | | | | | |
|----------------------------------|--------------------------------|--------------|---|--------------------------|------------------------------------|---------------|------|------|----------|
| | | | Registration | Outages (Participant UI) | Outages (APIs, including Net. Op.) | CTP interface | RTMS | STEM | WEMDE UI |
| 1 | Phase 1 (Wk1 April to Wk3 May) | 3/04/2023 | ⊗# | ✓* | ⊗ | ⊗ | ✓ | ⊗ | ✓ |
| 2 | Phase 2 (Wk4 May to Wk4 June) | 22/05/2023 | ✓^ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

Note all dates are provided as estimates. More up to date information will be maintained on the Reformer site.
 # The actual modified registration system is not expected to be completed, tested and integrated in time. Participants will need to provide suitable data in another form – similar to the approach for the RTMS system in MPT, which has provided participants with a template data form by which they can provide their registration standing data.

* In Phase 1 of Coordinated Market Trial, AEMO will ask participants (generators) submit outages via the Outages UI and AEMO will mock network outages. The use of the APIs will not be incorporated until Phase 2 of Coordinated Market Trial.

^ If the Registration system is not completed in time to be incorporated into Market Trial Phase 2, we will continue to use the template registration data form

Major releases will be supported with briefing sessions (section 6.2.2) and the issue of Test Packs (section 6.2.1). Minor releases will be advised to participants.

6.11 Release management

AEMO will maintain an internal Release Management Plan to cover all system releases into all our environments. This ensures appropriate testing, approval and communication processes are followed for all releases. Participants should note that more stringent processes apply to major releases into the Coordinated Market Trial environment compared to releases into the Market Participant Test environment.

More information on our external facing environments can be found in Appendix A2.

6.12 Other participant needs

6.12.1 Support

Table 12 Support issues – AEMO's approach

| Issue requiring support | Information |
|---------------------------------------|--|
| Accessing AEMO's testing environments | Refer to the Reformer for more information on how AEMO provisions access to its testing environments. https://aemocloud.sharepoint.com/sites/EXT-COM-REF/SitePages/Accessing-our-Test-Environments.aspx |
| Using PractiTest Tool | AEMO will provide the information for participants to link PractiTest accounts to AEMO's test releases closer to the Coordinated Market Trial commencement date. AEMO will support participants by: <ul style="list-style-type: none"> • running a short introductory session for Rule Participants to illustrate the tool and how it will be used; and • publishing notes on how to use the tool for the purposes of the WEM Reform Program and links to training materials, via the Reformer |
| Logging defects / issues | <ul style="list-style-type: none"> • AEMO will provide guidance on how to log defects / issues using PractiTest |



| Issue requiring support | Information |
|---|--|
| Interpretation of scenario outcomes | <ul style="list-style-type: none"> At the regular meetings of the relevant forum during Coordinated Market Trial following each test event, AEMO anticipates some participants will have questions about the interpretation of scenario outcomes. Rule participants are also expected to submit questions to wa.ets@aemo.com.au during this period. AEMO aims to provide scenario interpretation in response to participant questions. However, AEMO's ability to provide rapid interpretation will be contingent on the availability of suitable SMEs and the development of internal tools to support their ex post analysis of scenario data. AEMO anticipates that during the course of Coordinated Market Trial, its capacity to address scenario interpretation questions will progressively improve as some of its SMEs are freed up from tasks related to system development. |
| Questions regarding Coordinated Market Trial – e.g. interpretation of Test Packs. | <ul style="list-style-type: none"> AEMO will provide opportunities for group Q&A in the lead up to Coordinated Market Trial Rule participants can submit questions to wa.ets@aemo.com.au at any time. |

6.12.2 Feature requests

Since the scope prioritisation exercise AEMO undertook in September and October 2022, the WEM Reform Program has been strictly applying a minimum viable product lens to all scope items¹². AEMO's priority is to ensure it can deliver a safe and manageable set of systems by the NWCD of 1 October 2023 and it is maintaining backlogs of functionalities delivery or consideration for potential delivery after that date.

Rule Participants may identify potentially useful features and functionalities for any of the systems released into Coordinated Market Trial (or MPT) and are encouraged to share their suggestions with AEMO, ideally providing details of use cases, potential benefits and any guidance for implementation they can offer. However, Rule Participants should be mindful of the aforementioned MVP approach. AEMO does not expect to add requested features to the list of “must haves” already identified for implementation by the NWCD.

6.13 Outstanding details

Matters to be addressed in future revisions of this Strategy or in other related artifacts or communications are listed in Table 13, along with estimates for when these details are to be addressed.

Table 13 Elements to be addressed later

| Element to be addressed at a later date | Details | Est completion date | Update (early Feb 2023) |
|--|---|---------------------|--|
| PractiTest provisioning and support | AEMO must develop and communicate its approach to provisioning participants with PractiTest and providing initial training and support | Late Feb 2023 | Some details announced and full delivery on track. See WRIG meeting 09 February 2023 |
| Test packs detailed content | AEMO must develop test pack templates and proposes to share illustrative examples of test packs with participants for feedback | Mid-March 2023 | On track, see landing page for Coordinated Market Trial on the Reformer |
| Confirming process for setting API rate limits | API rate limits, including both the quantitative limits and the manner in which rate limits are applied, will be refined in parallel with Coordinated Market Trial – note that all non-functional testing of AEMO's systems is proposed as an internal activity for AEMO conducted in a parallel environment. | July 2023 | Performance testing of integrated system is progressing. AEMO will share testing outcomes as part of our liaison on rate limits – expected in April. |
| Coordinated Market Trial Registration administration | Registration requirements and forms. | March 2023 | Some details announced and full delivery on track. See WRIG meeting 09 February 2023 . Participants will be advised of an MS Form to complete later in February. |

¹² See [WRIG meeting 11 November 2022](#), Section titled “System development scope changes” on the Reformer SharePoint site.

7. Industry Testing: Transition Period

7.1 Overview

By the beginning of the transition period (July to Sept 2023), AEMO aims to have established a fully integrated suite of systems in a pre-production environment, which it can then use to simulate partial “parallel operations”. In planning the transition period, AEMO will allocate this limited systems resource to testing and training activities that are prioritised according to their importance for a successful go-live. As detailed in Section 7.2, below, these key priorities are likely to heavily weighted towards AEMO’s own readiness. Nonetheless, AEMO proposes to advance these priorities in ways that facilitate continued industry testing during the transition period. Key aspects of industry testing during the transition period are summarised in Table 14.

Table 14 Key aspects of industry testing during transition period

| Attribute | Details |
|-----------------|---|
| Purpose | To confirm AEMO market capabilities through continued testing, training and review activities by leveraging a complete set of production-ready systems and exposing our systems and processes to the market. |
| Scope | All systems and processes to the extent they can be included and/or mocked. Note that this will not include end-to-end settlement runs due to the limitations associated with mocking metering data. |
| Timing | July to September 2023 |
| Communication | Details to be confirmed, but likely to be slightly less frequent compared to during Coordinated Market Trial and to include: <ul style="list-style-type: none">• Reformer updates on scenarios• regular review sessions |
| Coordination | Moderate coordinated, details to be confirmed. |
| Link to Go-Live | <ul style="list-style-type: none">• Participants meeting all registration requirements will be entitled to access our systems in production• AEMO will publish updated market capabilities to ensure participants understand and can meet requirements for participating in the new WEM. |
| Environment | For more information regarding our testing environment, see Appendix A2 |

7.2 AEMO priorities for test systems during transition phase

The suite of systems in pre-production by the beginning of July 2023 will be a valuable and constrained resource. AEMO will prioritise testing and training activities that employ this resource during the transition period that allow AEMO to confirm the readiness of its own systems, processes and people. It will do so in a way that affords Rule Participants additional opportunities to do the same. However, AEMO does not intend to plan out and pre-advise the industry to the same extent as it will for Coordinated Market Trial. Instead, it will retain the flexibility to prioritise test activities closer to the event and to communicate test activities in a more limited manner.

AEMO will use the integrated systems to run multiple scenarios of business processes that include, but are not limited to, the business processes tested during Coordinated Market Trial. AEMO may extend these business processes to include additional steps that AEMO will perform with new systems or processes. For example, AEMO may produce a PASA report and simulating the internal processes that would precede a notice of a Low Reserve Condition (see Table 2 – Business Process 5).

7.3 Key differences from Coordinated Market Trial

During the Transition period, Rule Participants will continue to be able to perform realistic operations and observe results, much as they will have done in Coordinated Market Trial. However, there will be some important differences between the two stages.

During the transition period, AEMO will **not**:

- issue test packs,
- define and communicate scenarios for testing weeks in advance of the relevant test event
- hold test briefing meetings at the same high frequency anticipated for Coordinated Market Trial
- request participants to report test results
- formally report test results to the market

7.4 Communication and coordination

7.4.1 Communication

AEMO has not yet determined in any detail what communication arrangements are necessary and sufficient to support participants during the transition period. At a high-level, AEMO anticipates that these arrangements could include the following.

- Publishing information on the Reformer about the scenarios being run by AEMO on any given day.
- This information should at least be available on the day that the scenario is being run.
- The information should be retained or archived on the site where it is superseded by the equivalent data set for the following day.
- Holding regular review sessions through the same forum used during Coordinated Market Trial.
- AEMO staff involved in running a scenario could provide an informal report to participants on any issues, learnings, risks or other developments identified in recently run scenarios
- The same staff would then be available to address participant questions about recent scenarios.

7.4.2 Coordination

AEMO intends to undertake less coordination of participants during the transition period, compared to Coordinated Market Trial (AEMO won't provide test packs for the transition period, for instance). Instead, we will seek to drive participant behaviour through the market mechanisms being simulated in the pre-production environment.

Where necessary, AEMO may request participants (informally, instead of by simulating some formal market function) to undertake certain actions or to perform functions within specified parameters. The requirement for this type of coordination activity will become clearer closer to the start of the Transition Period and AEMO will provide additional guidance in subsequent updates.


7.5 Entry and Exit Criteria

7.5.1 Entry criteria

AEMO will establish entry for Rule Participants to access the pre-production environment.

Where participant completes Coordinated Market Trial

For participants that have taken part in Coordinated Market Trial, AEMO would expect to set, at a minimum, the following entry criteria for entry into the pre-production environment:

- 
- awareness of transition phase activities and communication channels (which will be advised at the time);
 - Appropriately skilled resources are nominated and available to execute and support testing.

Where participant does not complete Coordinated Market Trial

AEMO anticipates that some smaller market participants, such as small retailers without registered facilities may not have participated in Coordinated Market Trial. For these participants, AEMO would expect to set, at a minimum, the following entry criteria for entry into the pre-production environment:

- Interface testing of relevant systems has been completed in MPT (see Table 11);
- internal system testing completed;
- Appropriately skilled resource is nominated and available to execute and support testing.

Note that AEMO does not intend to use PractiTest with participants during the Transition Phase.

7.5.2 Exit criteria

AEMO intends to revise our Market Capabilities around the beginning of the transition period to reflect the core system, process and skills capabilities that we would expect market participants to have confirmed by the time our systems deploy to production.

7.6 Releases during transition period

An initial release into the pre-production environment is planned for the beginning of the Transition Period (1 July 2023). AEMO anticipates that it may need to issue further releases during the Transition Period and will always provide information to the market ahead of these. Such releases may include fixes for defects identified during Coordinated Market Trial. If system defects are identified during the Transition Period, AEMO is likely to favour process workarounds that allow it to defer the release of further defect fixes until after Go-Live.

8. Transition and Cutover

8.1 Overview

8.2 Transition Activities

8.2.1 AEMO's ongoing system testing, training and review

During the transition period, AEMO will continue to stress test the full suite of New WEM systems deployed in the pre-production environment and further will run scenarios using those systems in order to train our staff, refine our processes and inform revisions to our documentation. This will include the following activities:

- Developing, practicing and verifying the skills and process knowledge of key operational staff;
- Verifying and improving process documentation to reinforce and support correct use of systems and implementation of business processes;
- Testing contingencies and contingency responses and developing and/or refining contingency plans;
- Stress testing systems, processes and staff to identify limitations and test mitigations that may include system defect workarounds;
- Practicing and/or validating elements of AEMO's system cutover.

8.2.2 Rule participant transition activities

As discussed above, AEMO will continue running scenarios in the pre-production environment to afford participants ongoing opportunities to undertake similar activities to those set out in Section 8.2.1 above.

Rule participants will be responsible for determining their own transitional activities. The exception to this rule will be those specific obligations arising under the WEM Rules or set out in the Transition Schedule (see Section 8.3.4 below)

8.2.3 Assessing Rule Participant readiness

During the transition period, AEMO will draw together multiple information streams to evaluate the readiness of all Rule Participants. The key information streams are expected to be:

- market readiness surveys;
- Coordinated Market Trial participant reported testing results;
- individual participant interviews (at a minimum for all critical participants);
- information provided to AEMO in writing by Rule Participants regarding their readiness;
- results from AEMO's direct engagement with participants regarding SCADA readiness;
- joint reviews of readiness criteria with:
 - Western Power and
 - Synergy – having particular regard to the completion of the handover of all operational monitoring and control capabilities from AEMO to Synergy in respect of Synergy's generation fleet.

AEMO will undertake a risk assessment of Rule Participant readiness to be used as an input into the Go-Live Decision Making Framework (see Section 8.4.2).



8.3 Cutover

Cutover refers to the process of switching new systems into operation and shutting down the systems they replace. The process of switching to the New WEM will involve multiple cutover events that must be undertaken in a carefully staged and coordinated manner.

8.3.1 Cutover responsibilities

Each participant (and AEMO) participating in a cutover event will be responsible for developing and executing their individual cutovers in accordance with the timings and notification protocols in the Cutover Plan.

8.3.2 Cutover as a process, not a singular event

Cutover to implement the New WEM will be a many step process, not a singular event that occurs on the NWCD. To illustrate this point, consider the following preliminary list of milestones associated with cutover (Table 15).

Table 15 Preliminary list of milestones associated with cutover

| Area | Description | Timing |
|------------------|--|--|
| Registration | Updated Registration system goes live | 1 June 2023 |
| | Transition from Balancing to SCED APIs | Applicable for all Trading days commencing 1 October 2023. |
| | PDS Participant/Facility registration reports switch from Balancing to SCED framework | On first publication for Trading Day 1 October 2023. |
| Bilateral & STEM | Last STEM and bilateral submission / calculations / publications / auction under current framework | 29 September 2023 Scheduling Day |
| | New STEM and bilateral submission / calculations / publications / auction under new rules | 30 September 2023 Scheduling Day |
| Balancing & LFAS | Last NBDMO (and push) | 12:30pm 29 September 2023 |
| | Last Balancing horizon extension, noting BMO / LFMO calculation continues to work with shortened horizon | 1:00pm 29 September 2023 |
| | Last BMO / LFMO calculations (for dispatch) | 7:00am, 1 October 2023 |
| | Last BMO calculation (for provisional pricing) | 11:00am, 1 October 2023 |
| | Last BMO calculation (for final pricing) | 1:00am, 3 October 2023 |
| | Publish BMO (final) | 11:00am, 3 October 2023 |
| | Provisional TES Calculations | 8:30am, 3 October 2023 |
| | Final TES calculations | 2:15pm, 20 October 2023 |
| SCED / Dispatch | First Dispatch Schedule (2 hours) | 6:05am, 1 October 2023 |
| | First Pre Dispatch Schedule (8 hours) | 12:05am, 1 October 2023 |
| | First Week ahead (1 week) | 8:05am, 25 September 2023 |
| | Last dispatch instruction from RTDE | ~7:50am 1 October 2023, for 8:00am??? |
| | First dispatch WEMDE | ~7:55am 1 October 2023, for 8:00am??? |
| PASA | Last current MT PASA | 15 September 2023? |
| | Last current ST PASA Publication | 28 September 2023 |
| | First new MT PASA Publication | 1 October 2023? |
| | First new ST PASA Publication | 25 September 2023? |

8.3.3 Cutover plan

Around April 2023, AEMO intends to publish a draft Cutover Plan for consultation that:

- Focuses on the cutover of systems and processes that are AEMO's responsibility to manage, but which will consider the cutover activities of other parties to the extent necessary to ensure appropriate coordination¹³.
- Sets out timings and dependencies for cutover tasks, including any potential dress rehearsals, in the period leading up to, during and immediately post the cutover event
- Determines agreed completion, escalation and communication protocols to be activated during the cutover events
- Includes a decision-making protocol for 'proceed' and commitment decisions. The decision-making processes will reflect the level of dependence between participant and AEMO cutover activity for each system go-live. Where there are no interdependent cutover activities the market systems deployments will be managed by AEMO with notification of successful deployment and capability availability at completion.
- Establishes appropriate supports to provide post-cutover for the transition to 'business-as-usual' operations. The level of support will be dependent on the extent and scope of the change being deployed.

8.3.4 Transition Schedule

AEMO is required under new clause 1.56 of the WEM Rules to publish a regulatory instrument called the "Transition Schedule" by 30 June 2023. Clause 1.56.2 of the WEM Rules (reproduced below) describes in detail AEMO's obligation in respect of the Transition Schedule, which is in summary to publish an instrument identifying:

- information that Participants must submit ahead of NWCD as part of transition activity
- information AEMO must publish ahead of NWCD as part of transition activity
- the dates on or by which the information must be submitted or published

The Transition Schedule may only be published with the approval of the Coordinator of Energy. AEMO and other Rule Participants must then provide or publish information in accordance with the Transition Schedule.

AEMO plans to publish a draft version of the Transition Schedule early in Q2 of 2023 – well ahead of the prescribed deadline of 30 June 2023. AEMO would then seek the approval of the Coordinator of Energy and publish a final version close to that date.

¹³ In most instances, AEMO expects that Rule Participants should be able to schedule and manage their own system cutovers given adequate notice of and information about AEMO system cutover events. AEMO will invite Rule Participant suggestions on this point and consider covering third party system cutovers in the cutover plan on a case by case basis.

Breakout box 1: WEM Rules extract describing the Transition Schedule

- 1.56.2. Subject to clause 1.56.3, by 5:00 PM on [1 July 2023], AEMO must determine, and publish on the WEM Website, a document ("**Transition Schedule**") specifying:
- (a) the acts, matters or things to be done, which includes information to be provided or published, by AEMO and other Rule Participants relating to key operational activities under the Post-Amended Rules¹ in respect of the Scheduling Day for the Trading Day that is also the New WEM Commencement Day and any subsequent Trading Day for which activities are required to be done before commencement of the Post-Amended Rules;
 - (b) any other acts, matters or things to be done by AEMO or any other Rule Participant that are reasonably necessary or desirable to enable AEMO or any other Rule Participant to perform their respective functions under the Post-Amended Rules, including, without limitation:
 - i. operation of the Real-Time Market;
 - ii. scheduling and dispatch of Market Services and Non-Co-optimised Essential System Services;
 - iii. PASA assessments and Outages;
 - iv. operation of the STEM;
 - v. administration of the market under Chapter 2;
 - vi. administration of the Reserve Capacity Mechanism under Chapter 4; and
 - vii. settlement under Chapter 9; and
 - (c) the dates and times and, where applicable, the format, for when each of those acts, matters or things must be done.

Source: Tranche 6 WEM Rules Amending Rules

8.3.5 Contingency planning

AEMO and other Rule Participants must actively plan for a range of plausible contingencies to arise before, during or after the cutover process. Contingency planning involves defining steps to be taken if an identified risk event should occur. AEMO will document the main contingencies and responses within the Cutover Plan or other artifacts such as the Go-Live Decision Framework.

Table 16 Contingencies and responses

| Contingencies | Response |
|---|---|
| Critical IT systems are not deployable (or fail to deploy correctly) | Each system deployment to include planning for rollback during cutover Communication of proceed and rollback decisions in-line with the protocols set out in Cutover Plans. |
| One or more participants / facilities will not be ready for Go-Live | Through the Go-Live Decision Framework, document thresholds (e.g. MW of energy capacity; FCESS quantities) reflecting assessed risk to system security and operational workability under different scenarios. |
| Individual participant contingencies – e.g. unable to perform an operation by API | Where multiple integration options exist, participants should identify alternative options to achieve an equivalent or sufficient functionality. E.g. make real-time market submission by UI if unable to make API method work. |

8.4 Go-Live decision framework

8.4.1 Considerations

AEMO will develop a draft Go-live decision framework in Q1 of 2023 and publish for comment. The framework must integrate with other elements of this Strategy, and should consider:

- Risk management: key risks, mitigations and residual risks must be documented, evaluated and accepted or addressed further.
- Market Capabilities: essential market capabilities must be achieved and verified by Rule Participants;
- System Integrations: system integrations between AEMO and other Rule Participants must be tested and verified for a critical majority of the market
- Not Ready Thresholds: quantitatively defined proportions of participants or facilities that, if assessed as ready against essential market capabilities, would be sufficient to allow the new SCED market to operate securely and the integrity of supporting market processes (e.g. financial processes) to be maintained.
- Defects: defects must either be resolved or accepted by AEMO based on its assessment of the associated the business impacts and/or risks
- Communication: all stakeholders must be kept advised about decisions relating to Go-Live, through appropriate channels and in a timely way.
- Decision making process: AEMO must determine the process by which Go-Live decisions are to be made and clearly identify all accountabilities.
- Decision gate or gates: The key point(s) within the cutover process that afford a decision maker a meaningful choice or optionality as to how to proceed. Identifying whether there is one or multiple gates may benefit from differentiating the respective objectives of:
- AEMOs standard IT Change Management processes that apply to all individual preproduction or production release and
- The Go-live decision-making framework which must apply across the staged cutover of all systems to implement the WEM Reform Program.

8.4.2 Information inputs

AEMO will list the types and sources of information that it will consider as part of any decisions to be made under the Go-Live decision framework. These should include:

- The market readiness risk assessment prepared by AEMO and discussed in Section 8.2.3;
- Test summary reports;
- Technical assessments prepared by or for AEMO regarding operational, financial or safety risks to the WEM.

The intention is that these information inputs would be shared with the sector, however, some information may need to remain confidential. The Go-live decision framework will give guidance as to how this balance will be struck.

A1. Glossary

The following terms and acronyms have the following meanings for the purposes of this document. Clause references are included where appropriate to the [Wholesale Electricity Market Rules](#).

| Term | Definition |
|-----------------------------|---|
| AEMO | Australian Energy Market Operator |
| AGC | Automatic Generation Control – the process in which generators receive Dispatch Targets (MW setpoints) automatically from the Energy Management System (up to every 4 seconds depending on operating mode), via SCADA. |
| Business Process | a set of operations based on multiple Market Capabilities that produce one or more outcomes essential for the operational of the New WEM. |
| Cutover | A system implementation event |
| ESS | Essential System Services. Services besides energy and capacity able to be provided by facilities in the WEM. The term replaces the term Ancillary Services. |
| FCESS | Frequency Control Essential System Services – being that subset of ESS that are co-optimised for dispatch by WEMDE. These comprise regulation and raise and lower contingency services, analogous to the current ancillary services Load Following Ancillary Service (LFAS) and Spinning Reserve. |
| Functionality | refers to discrete features or capabilities of a system. Some Business Processes rely on a subset of the full set of functionalities to be delivered under WEM Reform for a given system. |
| Market Capability | A capacity or ability for a given type of entity the things it needs to know or be able to do to operate, support or participate in the to comply with the |
| Coordinated Market Trials | Formal, industry coordinated test activities between participants' and AEMO's IT environments. Involves coordinated multi-party end-to-end testing of business process scenarios. |
| New WEM | The WEM in its future state following the implementation of the WEM Reform Program, which will introduce SCED, enhanced system planning arrangements and supporting reforms to the RCM and the WEM's financial and administrative systems. |
| NWCD | New WEM Commencement Day. On 30 September 2021, the State Government announced that it will set the New WEM Commencement Day for 1 October 2023. The Minister is expected to Gazette this date around the same time as the Tranche 6 WEM Amending Rules (late 2022). |
| Non-Functional Requirements | define the constraints on how a system should provide the functions or features that it is intended to deliver and include security, reliability and availability and capacity or bandwidth. |
| PASA | Projected Assessment of Supply Adequacy. |
| Post-Amendment WEM Rules | The WEM Rules as in force immediately after the New WEM Commencement Day (per 1.56.1 of the WEM Rules) |
| RCM | Reserve Capacity Mechanism - through which the market operator procures generation capacity to ensure that adequate generation and demand-side management (DSM) capability is available to meet the peak demand for electricity |
| RTMS | Real Time Market Submission – an offer to provide energy and/or FCESS from a facility in the New WEM. |
| Rule participant | Any person registered as a Rule Participant in accordance with Chapter 2 and AEMO. In practice: AEMO, Western Power and market participants. |
| SCADA | Supervisory Control and Data Acquisition – the system operated by Western Power, used among other things, to convey dispatch instructions and other data between AEMO's systems and those of other Rule Participants. |
| SCED | Security constrained economic dispatch, which refers to a basket of changes to the real-time operation of the WEM, including dispatch solutions being constrained by network and other system limitations, 5 minute dispatch and co-optimisation of energy and FCESS services by WEMDE |



| Term | Definition |
|---------------|--|
| Scenario | a testing concept in which a given business process is fleshed out with specific assumptions, parameters and input data such that the systems involved in supporting this business process can be operated and tested. |
| Standing Data | Data maintained by AEMO under clause 2.34.1 of the WEM Rules. |
| STEM | Short Term Energy Market – a centrally cleared day-ahead market for Market Participants to adjust their contractual positions for energy by trading with each other |
| Transition | Process of shifting from current to future operating state |
| WEM | Wholesale electricity market – operating across the South West Interconnected System. |
| WEMDE | Wholesale Electricity Market Dispatch Engine |

A2. Milestones

The following table summarises milestones noted in this Industry Testing and Transition Strategy and provides approximate dates, current at the time of writing (early Feb 2023). For our most up to date schedule of milestones related to this Industry Testing and Transition Strategy, please see the Market Trial landing page on the Reformer SharePoint site: <https://aemcloud.sharepoint.com/sites/EXT-COM-REF/SitePages/Coordinated-Market-Trial.aspx>.

| Milestone | Estimated delivery date |
|--|--------------------------------|
| Release Draft Industry Testing and Transition Strategy for Consultation | Completed December 2022 |
| Release Version 1 of the Industry Testing and Transition Strategy (focussing on Coordinated Market Trial) | Completed early Feb 2023 |
| Publish Test Packs for Phase 1 of Coordinated Market Trial | 20 March 2023 |
| Commence Phase 1 of Coordinated Market Trial | 3 April 2023 |
| Release Draft Cutover Plan for Consultation | April 2023 |
| Publish Test Packs for Phase 2 of Coordinated Market Trial | 8 May 2023 |
| Commence Phase 2 of Coordinated Market Trial | 22 May 2023 |
| Release Version 2 of the Industry Testing and Transition Strategy (adding details on Go Live Decision Framework and Transition Activities) | May 2023 |
| Release Version 1 of Cutover Plan | May 2023 |
| Release Transition Schedule (see WEM Rules clause 1.56) | June 2023 |
| Publish Test Summary Report for Market Trial Phase 1 | Late May |
| Publish Test Summary Report for Market Trial Phase 2 | July |

A3. Environments

AEMO is using multiple environments to manage external releases, depending on the phase or activity to which the release relates. Table 17 summarises the main types of activities involving external releases and the environments to which relevant releases will be deployed.

A more up to date version of this table will be maintained on the Reformer under the Developer Centre tab – likely as an update to this page: <https://aemocloud.sharepoint.com/sites/EXT-COM-REF/SitePages/Accessing-our-Test-Environments.aspx>.

Table 17 Types of releases and environments

| Phase / Activity | Further detail | Examples | Environment Code | Example base URLs |
|--|--|--|------------------|---|
| Market Participant Test Releases | Unintegrated, standalone applications available for Rule Participants to test isolated business processes and support system builds. | See Table 5 | MPT | wems-pte1.aemo.com.au Note, this is expected to be replaced by the end of 2022 with: wems-MPT.aemo.com.au |
| WEM Reform Coordinated Market Trial Releases | Partially integrated applications (building to fully integrated) where AEMO facilitates co-ordinated testing of defined business processes with Rule Participants to confirm applications meet participant requirements and support participant system builds. | See Table 11 | ? | wems-MKT.aemo.com.au |
| Transition Phase | A fully integrated production ready system that can facilitate day / week / month in the life testing using production like data, processes and systems with internal and external stakeholders to confirm market and system outcomes | July to Oct 2023 | ? | TBC |
| RCM Releases | RCM releases are implemented following the standard pattern of a two-week release for external testing prior to Production. Standard in this context refers to the Market Trial release process that applies outside WEM Reform ¹⁴ . | RCM Phase 2 (March 2023); RCM Phase 3 (July 2023) | MKT | TBC |
| Production Releases | Conceptually the same as current production releases. | Registration (June 2023); RTMS, WEMDE, Outage Management etc closer to NWCD | PRD | wems.aemo.com.au |

¹⁴ See Reformer SharePoint site for more information: <https://aemocloud.sharepoint.com/sites/EXT-COM-REF/SitePages/Industry-Testing-Strategy.aspx#market-participant-test-versus-market-trial>. Note, access to the Reformer is restricted to market participants and their supporting service providers. If you believe you should have access, please email wa.ets@aemo.com.au.