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# Five-minute settlement and global settlement

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**September 2020**  
**v1.2**

Industry testing and market trials strategy

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# Important notice

## PURPOSE

The Industry testing and market trials strategy sets out the high level approach and principles associated with the IT system testing activities that will support five-minute settlement and global settlement implementation.

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## VERSION CONTROL

Version	Release date	Changes
0.1	30/09/2019	Initial draft issued for discussion with SMS/GS Readiness Working Group
1.0	29/11/2019	Final document incorporating feedback from participants
1.1	06/07/2020	Updates to reflect MDM deployment date change and strategy revision
1.2	30 /09/ 2020	Updated to include SMS industry implementation deferral considerations

# Executive Summary

The Australian Energy Market Operator (AEMO) and National Electricity Market (NEM) participants are currently implementing the five-minute settlement (5MS) and global settlement (GS) market reforms and the implementation program has entered its market readiness phase.

The National Electricity Rules (NER) changes for 5MS and GS have amended or introduced new regulatory obligations on certain NEM participants and AEMO. They require significant updates or changes to market procedures and market and participants' systems at various times. AEMO has a key coordination role, through collaboration with its industry working groups, to ready industry and itself for the various market commencement and IT system "go-live" dates.

As described in the 5MS/GS Market Readiness Strategy, a key component of market readiness is the industry testing phase – the period where AEMO and NEM participants test their market-interfacing business systems against updated procedures and AEMO's upgraded market systems

At a high level, the Industry testing and market trials strategy defines the scope, approach, process, responsibilities and high-level schedule of the industry testing phase for the 5MS and GS market transition. It is supported by detailed testing plans. The strategy is consistent with and should be read in conjunction with the 5MS/GS Industry transition and go-live strategy.

# Contents

<b>Executive Summary</b>	<b>3</b>
<b>1. Introduction</b>	<b>6</b>
1.1 AEMO's 5MS and GS implementation program	6
1.2 Purpose of the industry testing and market trials strategy	6
1.3 Reference documents	7
1.4 Related documents	7
1.5 Audience	8
<b>2. Industry testing and market trials framework</b>	<b>9</b>
2.1 Defining "market testing"	9
2.2 Market testing objective	9
2.3 Market testing scope	10
2.4 Market testing principles	11
<b>3. Industry testing and market trials strategy</b>	<b>13</b>
3.1 Industry testing and market trials strategy approach	13
3.2 Assumptions	19
<b>4. Strategy implementation: Market testing management</b>	<b>20</b>
4.1 Industry testing working group	20
4.2 Test management tool	22
4.3 Participant test registration	22
4.4 Communication and status reporting	23
4.5 Risk and Issues Register	23
<b>5. Strategy implementation: Market test planning and preparation</b>	<b>24</b>
5.1 Test Plans	24
5.2 Test data	25
5.3 Market test environment: AEMO's pre-production	26
<b>6. Strategy implementation: Market test execution approach</b>	<b>27</b>
6.1 Market Test Entry and Exit Criteria	27
6.2 Test scenario and script execution	28
6.3 Daily process	29
6.4 Test management activities	30
<b>7. Strategy implementation: Defect management</b>	<b>31</b>
7.1 Defect management approach	31
7.2 Suspension criteria and resumption requirements	36
<b>Glossary</b>	<b>38</b>

**Appendix A1. 5MS Issue Triage Workflow****40**

## Tables

Table 1	Reference Documents	7
Table 2	Relationship between the Industry testing and market trials strategy and other 5MS/GS documents	7
Table 3	Market testing types	9
Table 4	Phase 2: Industry test - Reallocations	15
Table 5	Phase 3 Invitation industry test MDM Platform and B2M APIs (formally phase1)	15
Table 6	Phase 4: Industry testing – Settlements and dispatch and bidding	17
Table 7	Phase 5: Market trial - Five-minute settlement	18
Table 8	Phase 6: Market trial – Global settlement	18
Table 9	Industry testing working group roles and responsibilities	20
Table 10	Industry working focus group’s relationship with 5MS/GS stakeholder forums	21
Table 11	Communications and status reporting	23
Table 12	Timeframes for developing the Industry test plans	24
Table 13	Test Management Activities	30
Table 14	Defect severity classification	32
Table 15	Defect priority classification	32
Table 16	Defect management status	34
Table 17	Defect cause	36

## Figures

Figure 1	Market testing phases underpinning the testing strategy	14
Figure 2	5MS Conceptual Architecture	26
Figure 3	Defect Management Cycle	35
Figure 4	5MS issue triage workflow	40

# 1. Introduction

This chapter provides background information on AEMO's five-minute settlement (5MS) and global settlement (GS) implementation program, and sets out the purpose, scope and approach to the development of this Industry testing and market trials strategy.

## 1.1 AEMO's 5MS and GS implementation program

The Australian Energy Market Commission (AEMC) made the 5MS rule<sup>1</sup> in November 2017 and AEMO's extensive 5MS implementation program began in early 2018.<sup>2</sup> GS activities were incorporated into the program when the GS rule<sup>3</sup> was made in December 2018 because aligning 5MS and GS implementation activities is intended to minimise costs for AEMO and market participants.

On 9 July 2020, the AEMC determined that the commencement of the 5MS rule and GS rule should be delayed by 3 months, so that they commence on 1 October 2021 and 1 May 2022 respectively.<sup>4</sup>

The program covers the procedural, IT system and market readiness arrangements needed to implement 5MS and GS using the following workstreams:

- Procedures – defines and implements the required changes to market procedures<sup>5</sup>
- Systems – designs, develops, tests, and implements changes to AEMO's market systems<sup>6</sup>
- Readiness – coordinates, assists and prepares AEMO and participants for the transition to 5MS and GS.<sup>7</sup>

AEMO's 5MS and GS implementation program has entered the market readiness phase of the project. This paper is specific to the industry testing and market trials component of market readiness.

## 1.2 Purpose of the industry testing and market trials strategy

This Industry testing and market trials strategy is a key component of AEMO's 5MS and GS Market readiness strategy. The purpose of the Industry testing and market trials strategy is to set out a plan for managing, coordinating, monitoring and reporting on AEMO's and NEM participants' industry testing activities and results. It aligns with the Industry transition and go-live strategy for 5MS and GS implementation.

It is a high-level document that describes the testing approach that applies to the entire 5MS/GS industry testing phase. As described in section 5.1, this strategy will be supported by individual test plans containing specific details about each of the planned industry testing phases.

<sup>1</sup> National Electricity Amendment (Five minute settlement) Rule 2017 No. 15, Australian Energy Market Commission, available at: <https://www.aemc.gov.au/rule-changes/five-minute-settlement>, as further amended by the National Electricity Amendment (Five minute settlement and global settlement implementation amendments) Rule 2019 No. 7, available at <https://www.aemc.gov.au/rule-changes/five-minute-settlement-and-global-settlement-implementation-amendments>

<sup>2</sup> Details of AEMO's 5MS and GS implementation program: <http://aemo.com.au/Electricity/National-Electricity-Market-NEM/Five-Minute-Settlement>

<sup>3</sup> National Electricity Amendment (Global settlement and market reconciliation) Rule 2018 No. 14, Australian Energy Market Commission, available at: <https://www.aemc.gov.au/rule-changes/global-settlement-and-market-reconciliation>, as further amended by the National Electricity Amendment (Five minute settlement and global settlement implementation amendments) Rule 2019 No. 7, op cit.

<sup>4</sup> Details on the delayed implementation of five minute and global settlement: <https://www.aemc.gov.au/rule-changes/delayed-implementation-five-minute-and-global-settlement>

<sup>5</sup> Details of the procedures workstream: <http://aemo.com.au/Electricity/National-Electricity-Market-NEM/Five-Minute-Settlement/Procedures-Workstream>

<sup>6</sup> Details of the systems workstream: <https://aemo.com.au/Electricity/National-Electricity-Market-NEM/Five-Minute-Settlement/Systems-Workstream>

<sup>7</sup> Details of the readiness workstream: <https://aemo.com.au/Electricity/National-Electricity-Market-NEM/Five-Minute-Settlement/Readiness-Workstream>

### 1.3 Reference documents

The following 5MS and GS related documents or web pages are relevant to the Industry testing and market trials strategy.

**Table 1 Reference Documents**

#	Document Name
1	<a href="#">EMMS Release Schedule and Technical Specification - 5MS - Reallocations</a>
2	<a href="#">MSATS Release Schedule and Technical Specification - 5MS - Meter Data</a>
3	<a href="#">EMMS Release Schedule and Technical Specification - 5MS - Dispatch and Operations</a>
4	<a href="#">EMMS Release Schedule and Technical Specification – 5MS and GS – Settlements and Billing</a>
5	<a href="#">5MS/GS Market readiness strategy</a>
6	<a href="#">5MS/GS Transition and go-live strategy</a>

### 1.4 Related documents

The Industry testing and market trials strategy is one of an integrated series of documents that support the 5MS and GS market readiness strategy, as illustrated by below. More information on each document is provided in the 5MS and GS market readiness strategy.

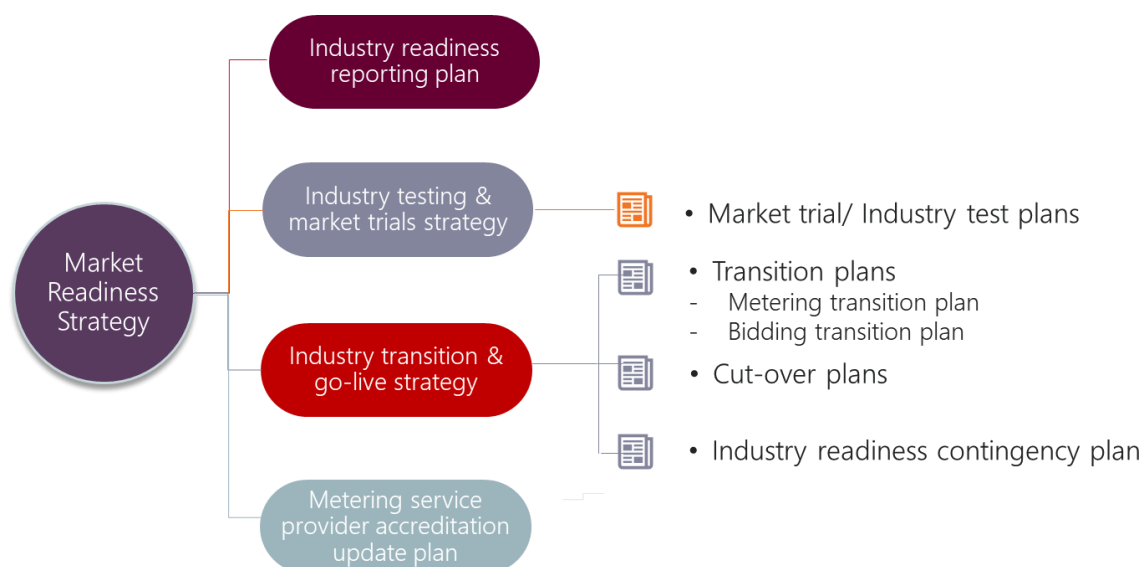


Table 2 shows how the Industry transition and go-live strategy interrelates with other key 5MS/GS readiness documents.

**Table 2 Relationship between the Industry testing and market trials strategy and other 5MS/GS documents**

Related document	Description of relationship
<b>Market readiness strategy</b>	The market readiness strategy is the overarching plan to guide AEMO and NEM participants' 5MS and GS readiness activities and operational

Related document	Description of relationship
	preparedness. The Industry testing and market trials strategy provides further guidance on the high-level transition and go-live schedules for 5MS and GS.
<b>Test plans</b>	These plans provide the detailed support for the test phases. See chapter 5.
<b>Industry readiness reporting plan</b>	The Industry readiness reporting plan sets out the information and processes that AEMO and NEM participants will use to monitor the industry's operational readiness for 5MS and GS commencements. AEMO will consider the market testing results as part of the readiness criteria for its proceed and contingency decisions.

## 1.5 Audience

This Industry testing and market trials strategy is primarily intended for all NEM participants affected by the 5MS and GS market reforms,<sup>8</sup> particularly their:

- Test managers, test leads, test analysts (system integration, UAT, industry testing and market trials) and project managers.
- Developers and business and functional SMEs.

Secondary audiences within these businesses including:

- Development managers
- IT operations teams
- Change controllers
- Operations teams

<sup>8</sup> For example NEM retailers, distributors, metering service providers, generators, small generator aggregators (SGAs) and market ancillary service providers.



# 2. Industry testing and market trials framework

This chapter describes the framework that underpins the 5MS/GS Industry testing and market trials strategy. It explains the strategy's objective, scope and underlying principles. It also defines 'market testing' for the purposes of 5MS and GS implementation.

## 2.1 Defining "market testing"

Throughout this document, "market testing" refers to the testing performed between NEM participants and AEMO to validate whether the updates made to NEM participants' market interfacing systems and AEMO's market systems comply with the 5MS and GS procedural arrangements. Market testing is conducted in pre-production as a final stage before deployment to production.

Generally, AEMO conducts three different types of market testing with the industry as explained in Table 3. This is in addition to the pre-production system being available for participants to perform self or bi-lateral testing at any time from when the changes are deployed.

**Table 3 Market testing types**

Type of market testing	Description	Example
<b>Industry testing</b>	Self-testing of functionality such as connectivity, and/or coordinated multi-party testing of functional scenarios	Testing a change request (CR) or processing a reallocation
<b>Invitation industry testing</b>	Coordinated testing of business process scenarios with a select number or subset of participants with systems ready for testing.	Testing NMI transfer Process
<b>Market trials</b>	Coordinated multi-party end-to-end testing of business process scenarios	Meter exchange involving CRs, services orders and 5-minute meter reads

## 2.2 Market testing objective

Market testing provides market participants the opportunity and tools to test their updated systems and processes against AEMO's updated electricity retail and wholesale market procedures and systems. AEMO will consider the market testing results as part of the readiness criteria for its proceed and contingency decisions.

In relation to 5MS and GS implementation, the overall objective of market testing is:

*to support market readiness and confirm AEMO's and participants' operational preparedness for the 5MS and GS system "go-lives" and rule commencements.*

## 2.3 Market testing scope

Market testing will consist of system integration testing between NEM participants' systems and AEMO's systems, to test the system changes required to implement 5MS and GS. Where required for a test phase, test plans will detail the scope inclusions and exclusions for that phase (see chapter 5).

The Industry testing and market trials strategy and associated testing plans relate to the various 5MS and GS commencements and market system changes as described below and in the Market readiness strategy.<sup>9</sup>

Relevant 5MS and GS commencements are:

- 5MS on 1 October 2021 (all 'Excluded' metering installations<sup>10</sup> must record and provide 5-minute data)
- Unaccounted for energy (UFE) reporting from 1 October 2021
- GS on 1 May 2022.
- Non-Excluded new and replaced<sup>11</sup> metering installations must record and provide 5-minute data by 1 December 2022.

AEMO, as the market operator, needs to make the following market system changes to implement 5MS and GS:

- Reallocations – upgrade to AEMO's system to support 5-minute reallocations
- Bidding and dispatch – upgrade to AEMO's systems to support 5-minute bids and offers
- B2M APIs – introduction of API interface capability to provide an optional, alternative interface approach
- MDM platform – upgrade of AEMO's meter data management system to support meter data processing for 5MS and GS
- NEM settlements – upgrade to AEMO's settlements system to support 5MS and GS
- MMS and related reporting.

Note that in supporting 5MS and GS market readiness, the approach to market testing is aligned with the approach to transition and 'go-live'. The approach to transition is described in the 5MS/GS Industry transition and go-live strategy<sup>12</sup> and is also considered in the market testing principles (section 2.4). Overall, the approach is to carry out a staged transition to introducing new system capability and upgraded platforms that:

- Enables a prudent and managed implementation as compared with a 'big-bang', hard start to 5MS and GS
- Provides participants with the necessary capability early so that they can undertake transition activities ahead of the mandated 5MS and GS start dates.

<sup>9</sup> See 5MS and GS Market Readiness Strategy at: <https://aemo.com.au/Electricity/National-Electricity-Market-NEM/Five-Minute-Settlement/Readiness-Workstream/Key-Readiness-Documents>

<sup>10</sup> As defined in the NER, *excluded metering installations* are types 1, 2, 3 and 7, along with type 4 meters at a *transmission network connection point*, or *distribution network connection point* where the relevant *financially responsible Market Participant* is a *Market Generator* or *Small Generation Aggregator*.

<sup>11</sup> If installed or replaced on or after 1 December 2018 (1 December 2019 for type 4A installations).

<sup>12</sup> See 5MS and GS Industry transition and go-live strategy at: <https://aemo.com.au/Electricity/National-Electricity-Market-NEM/Five-Minute-Settlement/Readiness-Workstream/Key-Readiness-Documents>

### 2.3.1 Scope inclusions

Market testing scope inclusions:

- Market capability based technical, functional and business operational testing as follows:
  - Market technical verification and validation:
    - Determines the technical state of the solution e.g. schema validations, connectivity and provided interfaces.
  - Market functional verification and validation:
    - Determines the state of solution as matched against required business functionality and business processes. The solution may not mirror production from a complete “go-live” perspective e.g. performed on low volumes of data and accelerated timeframes.
  - Market operational capability verification and validation:
    - Determines the state of the solution from a “go-live” perspective and verifies technical, functional and operational compliance to obligations. Mirrors as close as possible the “go-live” state of the solution from the perspective of data, timing etc. Covers key business processes essential to the operation of the NEM wholesale market.

### 2.3.2 Scope exclusions

Market testing scope exclusions:

- Changes to NEM participants’ supporting business systems that do not directly interact with AEMO’s market systems (i.e. back-end systems). These are addressed by participants own test strategies
- Any bilateral testing between participants. Participants can coordinate bilateral testing between themselves in parallel with industry testing, however reporting during industry testing will not refer to bilateral testing
- Downstream business procedures for each industry participant
- Industry transition and cutover process which will be tested as a component of cutover planning
- Testing of agreed non-critical business processes (unless otherwise agreed by the impacted participants)
- Accreditation and Registration.

Each NEM participant is responsible for their own preparedness in respect of the above matters and should account for such items within their respective organisational testing programs.

## 2.4 Market testing principles

Market testing of multiple-party interactions requires cooperation between participants to be successful. The following key principles should guide all parties involved in industry testing:

1. Testing strategy alignment with other 5MS and GS strategies: The Industry testing and market trials strategy will align with the 5MS and GS transition approach as described in the 5MS and GS Industry transition and go-live strategy. It will also operate in accordance with the Market readiness strategy.
2. Appropriate choice of testing type for each test phase: the type of market testing selected for each test phase will be in keeping with the complexity, materiality and implementation timeframe of the system change. This is to ensure that the cost, time and resources applied to testing are appropriate to the change. For example, simple industry testing is usually suitable for a minor change, as is a full market trial for a complex system change that affects large numbers of market participants.

3. Detailed test plans will be developed by AEMO in consultation with the Industry testing working group (ITWG) to support 5MS and GS testing activities, with the level of detail and involvement consistent with type of industry testing being conducted.
4. AEMO will provide timely and suitable test environments: AEMO will facilitate participants testing their updated systems and processes against AEMO's electricity retail and wholesale market procedures and systems update for 5MS and GS.
5. Adherence to the Industry test strategy and associated tests plans: all parties participating in market testing must use their best endeavours to adhere to the Industry test strategy and test plans – including meeting key dates, fulfilling entry criteria checklist, adhering to defect management guidelines and reporting guidelines.
6. Appropriately skilled resource capability: all parties participating in market testing must be appropriately resourced for the test planning and test execution effort.
7. Scope limited to critical business processes: any coordinated testing that requires interactions between multiple parties will be limited to critical business processes, unless otherwise agreed by the impacted parties. For example, business processes that affect key transactions that support market continuity.
8. Focus on the 5MS and GS market readiness and market testing objectives: all parties participating in market testing should be committed to cooperating with each other and be prepared to be responsive and flexible when responding to events, in accordance with the relevant 5MS and GS objectives.
9. Market testing outputs will be a consideration in market readiness assessments: For each market testing phase, the number, severity and type of defects will be a contributing factor to the relevant market readiness assessment along with the number of participants who took part in testing. This information will be considered by AEMO in its proceed and contingency decisions.
10. Release notes will be provided for each system detailing functionality and defects fixes applicable to the release.

# 3. Industry testing and market trials strategy

This chapter sets out the Industry testing and market trials strategy, comprising:

- the approach to market testing
- high-level test activities and timing
- assumptions underpinning the strategy.

## 3.1 Industry testing and market trials strategy approach

In accordance with the testing objective, scope and principles, the testing strategy for 5MS and GS provides participants with the necessary capability early so that they can choose to undertake preparatory and testing activities ahead of the mandated 5MS and GS start dates.

The strategy comprises of six test phases that support the staged industry transition to 5MS and GS and will be detailed in specific test plans (see chapter 5). These test phases relate to the following system go-lives and rule commencements:

1. B2M APIs
2. Reallocations
3. MDM Platform including B2B MTRD transactions
4. Settlements, dispatch and bidding platforms
5. Five minute settlement
6. Global settlement

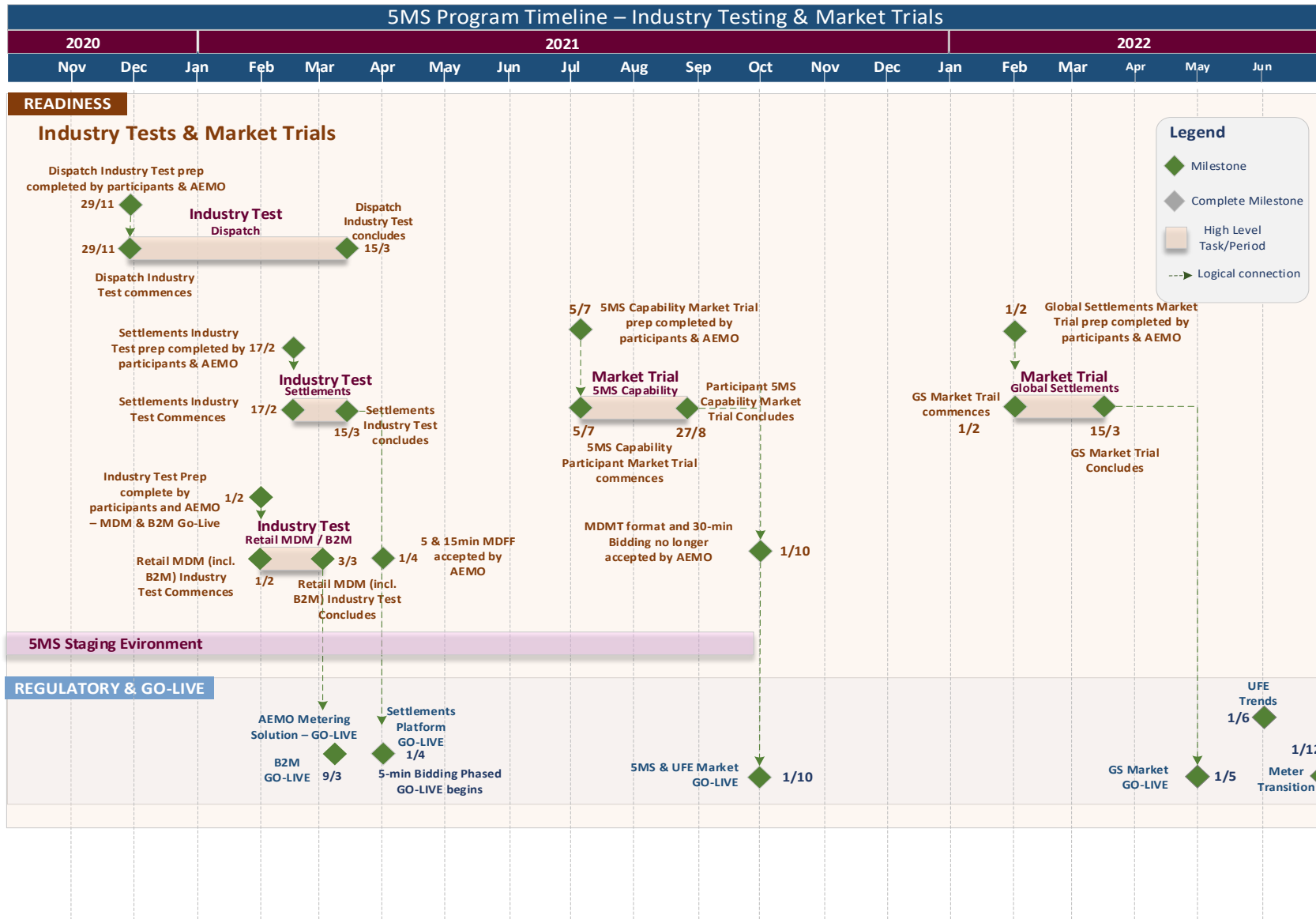
The timeframes of the market testing phases are consistent with the industry transition and go-live strategy, supporting the staged transition to 5MS and GS. 0 shows the inter-relationship between the staged 5MS/GS implementation and the testing strategy, particularly the key dates and milestones.

There are several NMI standing data changes required to implement 5MS and GS. The transition timeframes for completing this work currently under consideration by the Readiness Working Group and Transition Focus Group.<sup>13</sup> When transition timing for NMI standing data updates is confirmed, the changes will be tested in the most appropriate test phase to ensure participants have an opportunity to verify them before they take effect.

The strategy includes AEMO making available a test environment (additional to AEMO's pre-production) called the 'staging environment' to better support 5MS and GS participant testing and therefore market readiness. This environment allows participants to test their system changes against key AEMO system changes as the market systems are updated, well ahead of the commencement of the relevant market test phases. The staging environment allows participants to independently confirm their ability to interact successfully with AEMO's systems in advance of scheduled market test phases. Software releases will be available based on a published release schedule and supported by AEMO's Support Hub. Connectivity information is also published on the AEMO web site and can be obtained via AEMO's Support Hub.

<sup>13</sup> See 5MS and GS Metering transition plan at: <https://aemo.com.au/Electricity/National-Electricity-Market-NEM/Five-Minute-Settlement/Readiness-Workstream/Key-Readiness-Documents>

Figure 1 Market testing phases underpinning the testing strategy



Tables 4 to 9 below set out the high-level approach to each test phase. The tables describe the test phase, test objective and testing type and timing. They also identify the participants affected by the test phase.

**Table 4 Phase 2: Industry test - Reallocations**

<b>Reallocations</b>	
<b>Affected participants</b>	Retailers Generators Reallocators
<b>Description</b>	Verification of changes enabling participants with the capability to enter into 5-minute-based contract reallocations for periods beyond 5MS commencement (1 October 2021). 30-minute reallocations will be supported up to 1 October 2021.
<b>Test objective/s</b>	Technical compliance against the updated reallocations screens for existing functionality. Technical compliance against the updated reallocations screens where the date is beyond 1 October 2021.
<b>Test type</b>	Industry Testing Participants can access the changes when available in Pre-Production for the industry four weeks prior to this change being promoted to Production.
<b>Timeframe</b>	Testing in staging environment from 01 Nov 2019. Test phase commences: 17 February 2020 Test phase finishes: 13 March 2020

**Table 5 Phase 3 Invitation industry test MDM Platform and B2M APIs (formally phase1)**

<b>MDM Platform</b>	
<b>Affected participants</b>	Metering Data Providers and any participant who would like to develop API functionality for B2M transactions or access MSATS via the market portal. FRMP, LNSP whilst not affected would be of benefit to AEMO to assist with regression testing of selected B2M transactions.
<b>Description</b>	B2M MTRD and MDMT transactions and capability for submission of MDFF files for metering data submitted at 5 minute granularity, along with the introduction of the upgraded MDM platform operating in support of the existing 30 minute settlement market Verification of the new web service API for B2M, and the new web portal access. <i>The current access to MSATS and communications protocols for B2M remain active and fully supported.</i>
<b>Test objective/s</b>	Operation of the upgraded MDM platform in line with the current 30 minute settlement market Verification of B2B MDFF reads in 30, 15 and 5 minute format sent to participants.

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**MDM Platform**


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Verification of B2M MDFF reads in 30, 15 and 5 minute format sent to AEMO

Verification of B2M MDMF reads sent to AEMO.

Verify the:

- Interfacing protocols to support the submission of Inbox / inbound CATS, NMID and MDMT B2M messages and acknowledgments to AEMO by Participants. The submission of CR1000, CR1030, CR3005, CR3091 and CR3081
- Interfacing protocols for the delivery of Outbox / outbound CATS, NMID and MDMT B2M messages and acknowledgments to Participants by AEMO.

Confirm Network access protocols for Retail B2M message exchange.

- Accessibility of B2M communications through MarketNet (FTP).
- Accessibility of B2M API communications through the Internet and MarketNet.

Interfacing protocols for any B2M transaction types currently provided through legacy B2M Synchronous Web Services to Participants.

Verify protocols for any MSATS management functions currently provided through legacy B2M Synchronous Web Services to Participants by performing a NMI discovery.

Verify the new schema and RM report features the new schema provides by asking a number of participants to update to the latest schema and run reports while those staying on the current version of the schema run reports and verify accuracy.

Confirm MSATS Browser changes to allow Participants to:

- Manage their B2M Outbox protocol preference.

Manage their B2M Outbound messages queued in their queue.

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**Test type**

Invitation Industry testing: to support those participants implementing B2M APIs in their interfacing systems at this point in the transition process.

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**Timeframe**

Initial MDM release into staging environment from 01 December 2019

Test phase commences: 01 February 2021

Test phase finishes: 03 March 2021

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**Table 6 Phase 4: Industry testing – Settlements and dispatch and bidding**

<b>Settlements, Dispatch and Bidding</b>		
<b>Affected participants</b>	<i>Primarily affected:</i> Retailers Generators Small generation aggregators Market ancillary service provider	<i>Potentially affected via end-to-end market trial:</i> Distribution network service provider Metering service provider
<b>Description</b>	Changes specific to the Settlements system update to support current procedures  Changes resulting from the 5MS procedural changes and the upgraded Dispatch and Bidding platform to support the submission of 5-minute market bids.	
<b>Test objective/s</b>	New Bidding and Dispatch processes to support 5-minute bidding  Processes for the conversion of 30 minute bids into 5 minute bids during the transition period  Integration and interfacing upgrades for the Dispatch and Settlement platforms  Upgraded settlement platform supporting the current 30-minute settlement market	
<b>Test type</b>	Industry Testing  Participants can access the changes when available in Pre-Production for the industry prior to this change being promoted to Production.	
<b>Timeframe</b>	Settlements Test phase commences: 17 February 2021 Settlements Test phase finishes: 15 March 2021 Dispatch and Bidding Test Phase commences: 29 November 2020 Dispatch and Bidding Test Phase finishes: 15 March 2021	

**Table 7 Phase 5: Market trial - Five-minute settlement**

<b>Five-minute settlement</b>		
<b>Affected participants</b>	<i>Primarily affected:</i> Retailers Generators Small generation aggregators Market ancillary service provider	<i>Potentially affected via end-to-end market trial:</i> Distribution network service provider Metering service provider
<b>Description</b>	Update of the Settlements system to support current procedure followed by changes resulting from:  5MS procedural changes  Reporting of UFE as part of the GS implementation  Settlement reconciliation processes for 5MS	
<b>Objective/s</b>	Settlement invoice generation and reconciliation in 5MS environment Participant invoice reconciliation processes for 5MS Production and verification of settlement invoices produced for the 5MS market start period where settlement is split across 30- and 5-minute granularity	
<b>Test type</b>	Market trial with co-ordinated testing being conducted between participants and AEMO's systems.	
<b>Timeframe</b>	Test phase commences 05 July 2021 Test phase finishes: 27 August 2021	

**Table 8 Phase 6: Market trial – Global settlement**

<b>Global settlement</b>	
<b>Affected participants</b>	Retailers Metering Service Providers Distribution Network Service Providers Transmission Network Service Providers Generators
<b>Description</b>	Introducing GS configuration, including the financial settlement of UFE
<b>Test objective/s</b>	Settlement invoicing changes to incorporate the financial settlement of UFE Calculation of Settlement accounts under a Global Settlement regime Validate participant reconciliation processes for Global Settlement processes
<b>Test type</b>	Market trial: noting that the main participant category impacted by this phase of the market reform will be retailers and their wholesale settlement processes.
<b>Timeframe</b>	Test phase commences 01 February 2022 Test phase finishes: 15 March 2022

## 3.2 Assumptions

There are several key assumptions underpinning the Industry testing and market trials strategy:

1. AEMO will provide and maintain the single Pre-Production environment which will be used for all market testing phases.
2. Any change that is linked to or deployed to support a procedural or technical specification change will ensure the procedure(s) or technical specification(s) are documented and approved prior to the commencement of market testing.
3. AEMO will back-up production data and upload into the pre-production environment prior to testing of any MSATS system changes. AEMO will communicate the details and dates of this activity to all participants as part of the test phase planning and in consultation with the ITWG.
4. AEMO will provide and upload agreed test cases for any AEMO coordinated testing activities to Practitest<sup>14</sup> Testing Modules and provide Practitest support during the market testing.
5. AEMO will perform all internal functional testing prior to the release of any changes into pre-production. AEMO will perform internal non-functional testing prior to the release of any changes into pre-production for all SMS and GS changes that AEMO is coordinating.
6. Participants will register their interest in participating in any of the market testing phases prior to their commencement, as detailed in the respective test plans.
7. Participants will perform internal testing prior to connecting to the AEMO pre-production environment.
8. Participants will have appropriately skilled resource capability for execution and support requirements during market testing.
9. Participants will ensure that the appropriate access to AEMO's pre-production environment is in place to support their market testing requirements.
10. Participants will ensure that defined test data is prepared and available within their test environments for market testing and that this data is appropriately baselined and backed up.
11. All participants engaging in invitation industry testing or market trials will use Practitest as the central test management tool to:
  - execute test cases
  - undertake defect management
  - produce dashboard reporting.
12. Results from market testing may be used by participants as one factor in AEMO's and their own assessment of market readiness criteria.
13. AEMO will support participants with resolution of connectivity issues within the Pre-Production environment.

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<sup>14</sup> Practitest is AEMO's test management tool. For more information, see section 4.2.

# 4. Strategy implementation: Market testing management

This chapter explains the roles and responsibilities of the 5MS and GS Industry Testing Working Group (ITWG) and sets out how AEMO and participants will interact throughout the testing phase of these market reforms.

## 4.1 Industry testing working group

The ITWG will be established to co-ordinate and execute industry testing and market trials for the 5MS and GS market reforms. It will be established in late October 2019 to:

- Engage in detail on 5MS and GS industry testing matters
- Collaborate on the development of the detailed testing plans
- Ensure that market testing considerations are captured in program timelines as readiness activities.

Each participant will provide market test resources to be part of the ITWG for the duration of market testing preparation and execution activity. It is expected that those resources will be adequately skilled to meet the needs of the preparation activity. The ITWG will meet as required to drive the planning and preparation and execution process, as per the ITWG Terms of Reference. High-level ITWG roles and responsibilities are set out in Table 10. Table 11 then explains the ITWG's relationship with the various 5MS/GS stakeholder forums.

**Table 9 Industry testing working group roles and responsibilities**

Role	ITWG responsibilities
<b>AEMO and participants' test leads</b>	<ul style="list-style-type: none"> <li>• AEMO to develop test plans (see chapter 5)</li> <li>• Developing all test preparation materials, including test scenarios, test scripts and data sets, as required.</li> <li>• Submitting test registration requests, entry and exit criteria checklists, software or connectivity requests to AEMO, when requested.</li> <li>• Managing the testing process as prescribed in this strategy and the supporting test plans, including:               <ul style="list-style-type: none"> <li>– Undertaking test execution as scheduled.</li> <li>– Updating Practitest with test progress and results.</li> <li>– Communicating with testing counterparties as required.</li> <li>– Attending scheduled stand-up and ad-hoc meetings.</li> <li>– Adhering to the defect management process including the retesting of fixed defects.</li> </ul> </li> </ul>
<b>ITWG facilitator and chair (AEMO Test Lead)</b>	<ul style="list-style-type: none"> <li>• Coordinating the test preparation activities.</li> <li>• Initial set-up of Practitest with test scenarios and test scripts for participant review.</li> <li>• Requesting and collecting test registration requests, entry criteria checklists, and software and connectivity requests, and coordinating the issuing of any required licences for the testing tool or connectivity credentials.</li> </ul>

Role	ITWG responsibilities
	<ul style="list-style-type: none"> <li>• Coordinating test counterparties (e.g. arranging pairings or grouping for test scenarios).</li> <li>• Coordinating the test execution process as prescribed in this Industry testing and market trials strategy and the industry test plans including:                             <ul style="list-style-type: none"> <li>– Scheduling and chairing regular stand-up and ad-hoc meetings.</li> <li>– Scheduling and chairing daily meetings during test execution windows.</li> <li>– Communicating test readiness (i.e. giving individual participants, participant pairings or participants groups, the go-ahead to begin test activities).</li> </ul> </li> <li>• Communicating status reports and updates to the ITWG, RWG and other 5MS forums.</li> <li>• Where possible, provide initial assistance before escalating participant issues to their RWG representative. For example, participant non-responsiveness in test execution such as running behind test schedule, not updating Practitest or following the defect management process.</li> </ul> <p>Referring defects that cannot be resolved by the individual participant, or at the ITWG, level to the relevant Procedures working group or the 5MS-PCF for resolution.</p>

**Table 10 Industry working focus group's relationship with 5MS/GS stakeholder forums**

5MS/GS forum	Relationship with ITWG
<b>Readiness working group (RWG)</b>	The ITWG is a sub-group of the RWG. The RWG will receive regular status reports on the testing progress. The ITWG will refer any participant issues or defects that cannot be resolved at the SWG to the RWG.
<b>Program consultative forum (PCF)</b>	The PCF will receive regular status reports and escalations on testing progress via the RWG.
<b>Systems working group (SWG)</b>	<p>The ITWG will refer defects to the SWG if market testing uncovers:</p> <ul style="list-style-type: none"> <li>• A showstopper defect in the technical specifications themselves e.g. something that cannot technically work as prescribed.</li> <li>• An area in the technical specifications which is open to interpretation, and guidance is required from the SWG. If possible, the ITWG will first agree on a proposed interpretation for the SWG's endorsement.</li> </ul> <p>It is the SWG's responsibility to convene as soon as possible to address the issue and report back to the ITWG chair. If the SWG cannot come to an agreement, then the issue will be referred to the RWG.</p>
<b>Procedures working group (PWG)</b>	The PWG is in hibernation following the completion of the 5MS/GS procedures workstream. Procedure changes or issues that emerge as a result of testing activities should be referred into AEMO's 'business as usual' procedure change processes for

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5MS/GS forum	Relationship with ITWG
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resolution, in consultation with the RWG.<sup>15</sup> The PWG can be reactivated on an ad-hoc basis to respond to material procedures issues if necessary.

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## 4.2 Test management tool

Practitest will be used to manage the market testing, including test scenarios, test script development, test execution, test results, the tracking of test defects during all cycles and dashboard reporting.

Practitest will be configured by AEMO with all required information and will be monitored and supported by AEMO. AEMO will provide one free dedicated licence to each organisation. If any organisation requires additional licences, AEMO will purchase on the organisations' behalf at a cost charged back to the organisation.

This tool is available over the internet and the link will be provided closer to the test commencement date and AEMO will provide training to any participant on request.

## 4.3 Participant test registration

Each participant will need to register with AEMO their intention to undertake market testing prior to the commencement of the corresponding market testing phase. Test registration is required so that multi-party test scenarios can be planned and scheduled from an end-to-end perspective.

Registration requirements and templates will be included in the Test Plans. AEMO will prompt for test registration requests and may request participants to complete templates or checklists as part of the registration activities. Participants will need to register each role within the market that they are responsible for. Where they have multiple ID's for the one role, a single registration with all IDs is required.

All registration requests and queries for market testing should be sent through using the 5MS inbox: [5ms@aemo.com.au](mailto:5ms@aemo.com.au).

Each Registration will be given two login ID's with additional logins available dependant on the number of participants engaging in the testing activities.

### 4.3.1 Participant ID and roles

The term 'Participant' is used to indicate a unique role that a given business is to adopt for the purpose of testing. For example, where a participating business fulfils the role of LNSP and MDP, these roles are classed as different participants for testing purposes.

- If an organisation has more than one role (i.e. is more than one 'Participant ID', then it may need to separately carry out testing for each role (as each participant role has different B2B and B2M transactions).
- If an organisation has more than one participant ID but they are all for the same role, then as long as the participant is using the same set of systems for each ID, the participant would only need to perform testing one for those IDs.
- Participants will detail which participant roles and ID they will be testing under as part of their Test Registration.

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<sup>15</sup> For example: the B2M metering, metering data and standing data procedure changes or issues should be raised to the Electricity Retail Consultative Forum; B2B metering, metering data and standing data procedure changes or issues should be raised to the Information Exchange Committee; Settlements and prudentials procedure changes or issues should be raised to the respective AEMO teams; Dispatch and bidding procedure changes or issues should be raised to the NEM Wholesale Consultative Forum.

## 4.4 Communication and status reporting

Commencement of status reporting will be aligned with the test execution for invitation industry testing and market trials. Commencement of daily status meetings will align with test execution periods for all test phases.

Table 12 describes how the progress of market testing will be monitored and reported. Communications and status reporting will involve both AEMO and participants.

**Table 11 Communications and status reporting**

Frequency	Type	Responsible
<b>1. Continuous</b>	Updates in Practitest for status of test cases and defects	AEMO and Participants
<b>2. Daily</b>	Status reports & Traffic light reports readiness reports  Test status meetings	AEMO
<b>3. Milestone based</b>	Milestone reports, Test Completion Reports	AEMO

In addition, testing progress will be reported on through the 5MS/GS industry readiness reports and at the RWG.

## 4.5 Risk and Issues Register

AEMO has established an industry risk and issue management process for 5MG and GS and maintains the industry risks and issues log on its website.<sup>16</sup>

Market testing related risks and issues with the potential to affect program readiness should be raised via the RWG as a readiness-related risk or issue.

<sup>16</sup> See: <http://www.aemo.com.au/??/5ms-Industry-Register.xlsx>

# 5. Strategy implementation: Market test planning and preparation

The strategy sets out the approach and high-level timing for 5MS and GS market testing. To operationalise the strategy, more detailed test plans will be developed by AEMO in consultation with participants to set out the details associated with the market testing activities.

## 5.1 Test Plans

As part of the preparation for market testing, a series of workshops will be held by the ITWG to develop the Test Plans for the different phases of testing with the content and level of detail as appropriate for the type of market testing to be conducted.

The Test Plans will include:

- Test phase objectives
- Detailed scope of testing
- Pre-requisite activities
- Entry and exit criteria
- Test cycle approach and dates
- Data management
- Defect management
- Test reporting requirements

Note that there will not be a test plan for reallocations because participants have agreed to informal testing which does not require industry coordination.

Table 13 sets out the timetable for the development of the market test plans

**Table 12 Timeframes for developing the Industry test plans**

Test plans	ITWG Engagement	Draft Plan	Consultation	Finalised Plan
<b>MSATS – MDM Platform/ B2M APIs</b>	Sep 2020	Oct 2020	Nov 2020	Dec 2020
<b>Five-minute settlement</b>	Feb 2021	March 2021	April 2021	May 2021
<b>Global settlement</b>	Sept 2021	Oct 2021	Nov 2021	Dec 2021



### 5.1.1 Test Workbooks

The test plans for industry testing and market trials will include test workbooks. These workbooks will document the test scenarios, data requirements, registered test participants and test calendar. The test calendar will include the test participant matrix, detailing who each participant will test with and when.

The ITWG will develop the test workbooks, and associated scenarios, scripts and calendar, by:

- Defining the test scenarios required for industry testing and market trial, including identifying:
  - Scenario priority
  - Testing counterparties
  - Data requirements
- Defining and preparing the subsequent test scripts that will need to be executed.
- Defining the approach and timing of test script execution.

## 5.2 Test data

### 5.2.1 Data requirements

Data requirements will be developed during the test planning stage, and the approach to data management will be detailed in the respective Test Plans.

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 Workbook
- Participants will be responsible for identifying data from their systems that fulfils those data requirements. It is suggested that participants select a range of NMI for each test case.
- Participants will then align their scenario data with their testing counterparties.

Multiple test data sets should be identified for each test scenario to allow for multiple executions of that test scenario in case of defects or problems in execution. Data identified will be mapped against every scenario in the Description field in Practitest .

Participants are responsible for ensuring that any required data is available within their test environments for industry testing and market trials test execution.

### 5.2.2 Data refresh

AEMO will undertake a data refresh prior to each application being deployed to pre-production for industry testing and market trials. The details of these will be discussed and communicated via the ITWG in the lead up to each go live. Participants are encouraged to align their pre-production data if possible, as this will make aligning data between participants easier.

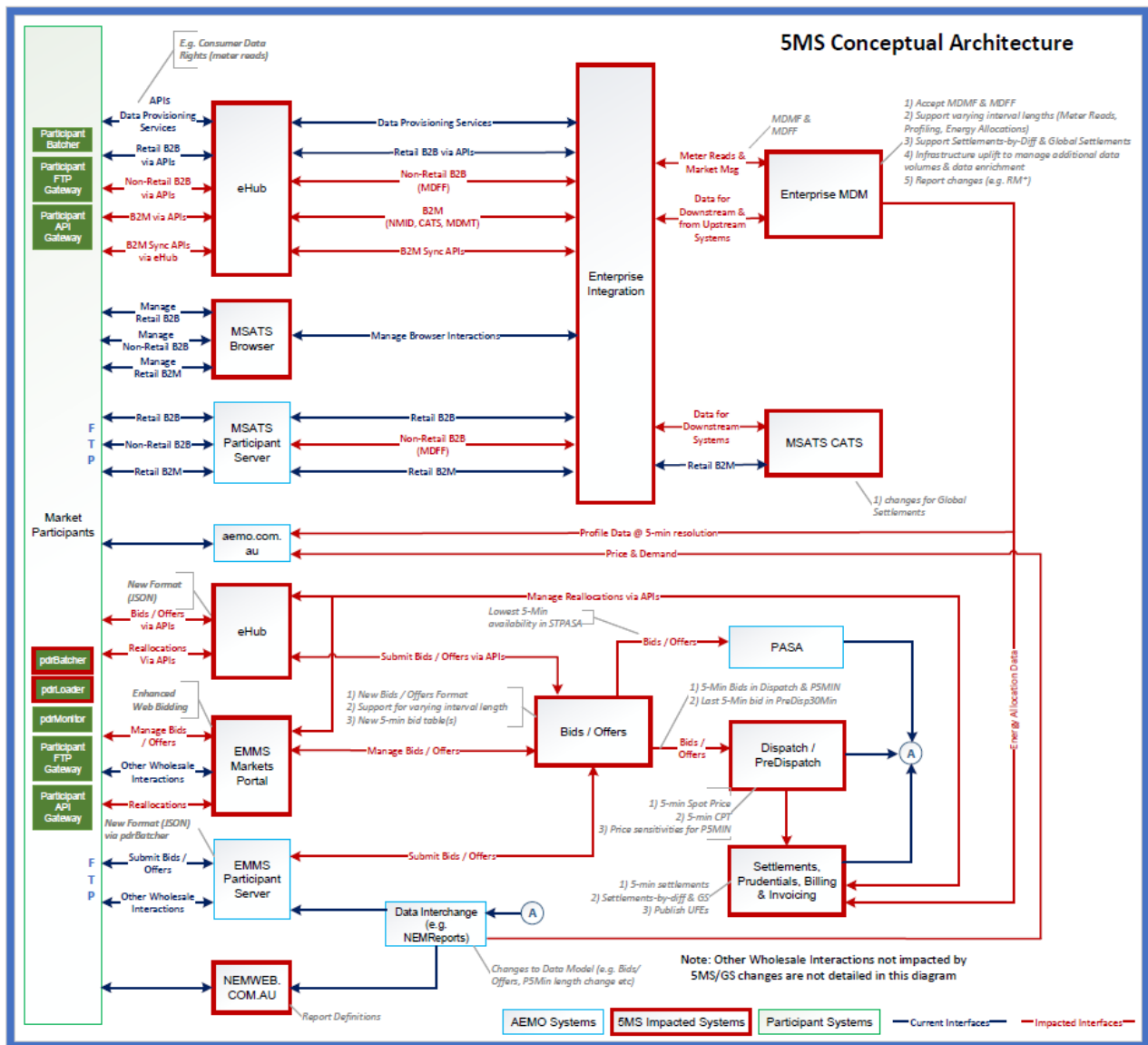
### 5.3 Market test environment: AEMO's pre-production

AEMO will prepare and maintain the single pre-production environment prior to the commencement of market testing and throughout the test execution phases for the duration of market testing. All participants with valid participants IDs will have access to the pre-production environment for industry testing and market trials. AEMO will back-up and refresh the data and support the pre-production environment.

The Market Test environment is separate to the 5MS/GS Staging environment, which has been provided as a basis for supporting participant systems development ahead of market testing.

All participant test environments will be maintained and managed by the respective participants. Figure 2 shows the architecture diagram of the 5MS market testing environment.

Figure 1 5MS Conceptual Architecture



#### 5.3.1 Test support

Test support for 5MS and GS during the test phases in pre-production environment will be provided between 09:00 and 17:00 Hrs (AEST) on business days.

# 6. Strategy implementation: Market test execution approach

The ITWG will monitor and manage all industry testing and market trial execution activities. Participants are responsible for supplying their own teams for test execution for the duration of market testing.

## 6.1 Market Test Entry and Exit Criteria

The entry and exit criteria for each market test phase will be defined in the relevant Test Plans. Depending on the testing defined, the criteria are likely to be based on those listed below. Reporting on readiness to participate, based on entry criteria for all registered parties will be published in the lead up to test execution.

### 6.1.1 Entry criteria

AEMO and participants will be asked to complete and submit entry criteria checklists prior to the commencement of industry testing. This may include, but is not limited to the following criteria:

- Participants internal testing completed.
- Pre-production participant ID received for new participants (via registration and accreditation process), if relevant.
- Connectivity testing complete (aseXML validation).
- Test data preparation (in line with test scripts/cases, i.e. roles and NMI ranges) is complete.
- Appropriately skilled resource capability available to execute and support testing.

AEMO will confirm the following:

- Pre-production environment available.
- The relevant Industry Test Plan is complete, agreed and delivered to the ITWG.
- Practitest is configured with all required test information and is accessible and useable by all testing participants.
- Registration of participants in the test phase with nominated role ID's to be used in testing.
- Testing participants have confirmed readiness (through the submission of completed entry criteria checklist).

## 6.1.2 Exit criteria

Exit criteria for the test execution phase may include:

- Successful completion of all high-priority test scenarios.
- No outstanding Priority 1 or Priority 2 defects.
- Any open defects (Priority 3 or 4) have agreed resolutions or work around in place and published.
- Final Test Summary Report completed.

The overall result of each phase of market testing will be one factor included in the assessment of the overall market readiness for each phase of implementation.

## 6.2 Test scenario and script execution

Test execution will be undertaken as follows:

- Respective test plans are created in Practitest Test Execution modules for all participants to facilitate testing.
- Tests scenarios and scripts that are in scope for participants will be set-up in their respective test plans of Practitest Test execution module.
- Execution of the testing will be undertaken according to execution calendar made available as part of the preparation activities.
- Informal testing may occur between participants, however reporting of the market testing will be based on the defined execution calendar.
- Test execution information will be updated in Practitest as it occurs, i.e. in as close to real time as possible. This will include test progress, status and data used.
- An audit trail of test execution is to be undertaken by participants. This includes capture of positive results to prove that a test met expected results as well as capture of negative results for defect resolution. For example, participants can use MSATS screens as evidence of their test results. Where applicable, this information will be maintained in Practitest. Where this is not applicable, e.g. particularly large files, participants should store the required information accordingly, so it can be referenced as positive proof of testing.

### 6.2.1 Test status

After running each test script, participants will update the test script status in Practitest as below:

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

AEMO will use these test statuses to generate the status traffic light reports and circulate prior to the daily test status meetings.

## 6.2.2 Test metrics

Test measurement during market testing will be based on but not limited to the following metrics:

- 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 blocked versus test scenarios planned
- Number of test scenarios deferred/not applicable versus number planned
- Outstanding defects including the impact and agreed date of resolution

These metrics will be reported as appropriate in the test status reports which AEMO will generate and circulate prior to daily test status meetings.

## 6.3 Daily process

The daily process to be adopted during each market testing phase will be detailed in their respective Test Plans, including

- Frequency of daily test status meetings (number of meetings per day - which may be adjusted as testing execution progresses).
- Number and scheduled time/s of daily test status meetings.
- Meeting attendees (one meeting for all attendees or multiple meetings with targeted attendees).
- Meeting agenda templates.

To prepare for the scheduled meetings:

- Participants will be asked to update Practitest prior to the meeting
- AEMO will generate and circulate the test status report and status traffic light report prior to the meeting

The daily test status meeting agenda will include:

- Confirm attendance
- Test execution progress
  - Review planned against actual progress for test execution. Discuss exceptions against planned execution.
  - Confirmation of readiness to commence scheduled tests
- Review defect status – outstanding defects.

## 6.4 Test management activities

Table 14 shows the activities which will occur during market testing and who is responsible for them.

**Table 13 Test Management Activities**

Activities	Description	Timing	Responsibility
Prepare tests	Configure Practitest with test scenarios and test scripts.	Prior to the commencement of test phase execution	AEMO
Identify data	Identify data sets for each test scenario, enter in Practitest and confirm with testing partners.	Prior to the commencement of test phase execution	Participants, AEMO may assist if required
Execute tests	Individual testers to perform test execution and capture actual results of testing in Practitest.	Daily	Participants
Update progress	Progressively update the status of each script tested in Practitest.	Daily	Participants
Raising defects	Raising defects from failed scripts or any other root cause in Practitest.	Real time immediate as soon as the script has failed.	AEMO and Participants
Managing defects	Review defects logged in the Practitest to identify major defects and determine the impact of those defects.	Daily	AEMO and Impacted Participants
Retesting defects	Retesting defects once they are available to testers is a priority.	Defect retests are to be completed prior to commencing new scripts.	AEMO and Participants
Test phase entry	Complete entry criteria checklist	Prior to the commencement of test phase execution	AEMO and Participants
Test phase exit	Complete exit criteria check	At the completion of test phase execution	AEMO and Participants
Test status meetings	Test status meeting to be attended by test representatives from all participants to discuss progress, issues and defects.	Daily (or as detailed in the Test Plan)	AEMO and Participants
Update Risks and Issues Log	Risks and Issues that arise and negatively affect testing progress will be recorded as identified.	As required	AEMO and Participants

# 7. Strategy implementation: Defect management

## 7.1 Defect management approach

Market testing defect management will be a collaborative effort, principally involving AEMO's and participants' testing teams, development teams and business analysis teams. There will, at times, be a need to consult other projects' team members for advice and assistance on the resolution of defects. Defect management will be managed entirely within Practitest .

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 all 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.

A template will be provided to assist participants with the creation of defects.

### 7.1.1 Raising defects

Defects raised during market testing will be captured in Practitest , with the following information:

- Description of defect
- The test scenario and/or test script associated with the defect
- Who detected it and the date it was detected
- Defect owner (entered after gaining agreement between testing counterparties as to who owns the defect)
- Target fix date (entered by defect owner)
- Defect priority
- Defect status
- Defect root cause (entered by defect owner).

For SMS and GS implementation, 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.

As a general principle, any information that occurs during market testing and assists with risk mitigation for the "go-live" solution may be captured.

Defect statuses and progress on defect fixes will be discussed in the daily test status meeting.

### 7.1.2 Defect triage

Defect triage occurs during the daily test status meeting. Test scenarios or scripts that are blocked with critical or high priority defects will be discussed in the meeting. The defect owner and the target fix time will be agreed for critical and high priority defects blocking test execution.

Participants and AEMO should review defects frequently on daily basis and update the target fix date/time in Practitest for everyone's reference.

Appendix A1 contains a workflow of the Testing issue triage process.

### 7.1.3 Defect escalation

All open defects will be discussed in the daily test status meeting. If a critical/high priority defect can't be resolved within the agreed timeframes, it can be escalated in the daily test status meeting. If required AEMO will arrange a separate defect triage meeting with the relevant participants to see that the defect is resolved quickly to progress test execution.

### 7.1.4 Defect prioritisation

Defects will be classified according to severity and where there are multiple within a severity, they will be address based on priority by the participant test leads in consultation with other affected participants. Priority will indicate the degree to which the defect affects both the system capability, testing execution and the overall project. Priority is determined by assessing probability of system and the business impacts. Table 15 describes each priority classification.

**Table 14 Defect severity classification**

severity	Definition
1- Showstopper	Defect is considered critical to business operations and/or testing. Core business and project impact. Fix/resolution turnaround time best endeavour effort in first 4 hours or provide update on 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 15 Defect priority classification**

Priority	Definition
1- Critical	Defect is considered critical to business operations and/or testing. Core business and project impact. Fix/resolution turnaround time best endeavour effort in first 4 hours or provide update on impact.
2-High	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.



Priority	Definition
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-Low	Defect is considered low impact to the business operations and/or testing. Core business processes are unaffected, and testing is still able to continue.

Post triage and acceptance of a defect, a resolution date will be added and published in the daily status report for all identified defects.

### 7.1.5 Defect management status

Table 16 shows the valid defect management statuses to be selected in Practitest .

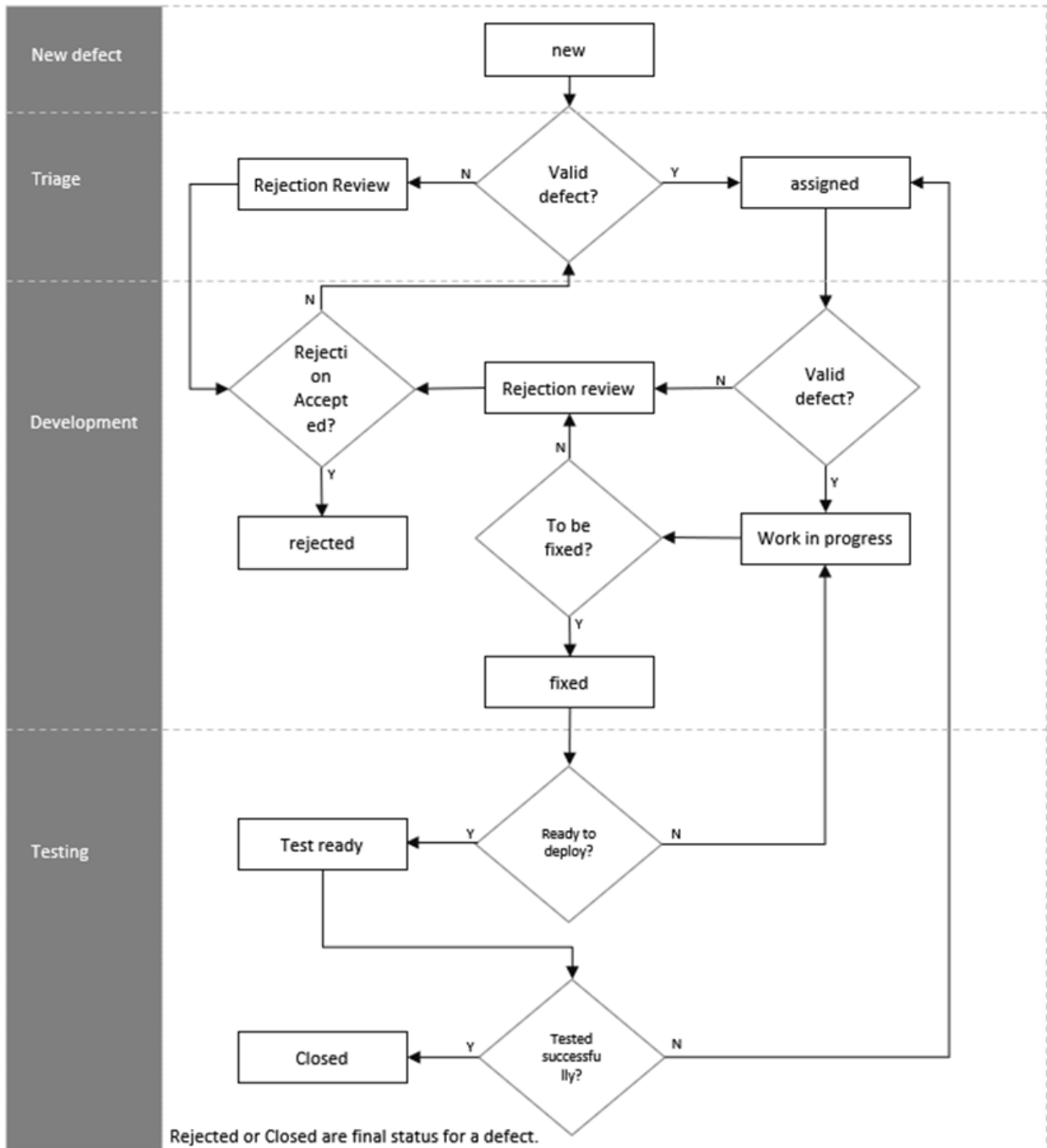
**Table 16 Defect management status**

Priority	Definition
New	Initial defect raised but will require a triage to determine if further analysis is required and whether it is a true defect as such to move to an assigned status.
Assigned	Defect will be assigned to the appropriate development team to be addressed further assessed and progressed.
Work in Progress	Practitest item that is considered valid to be set to 'Work in Progress' to be fixed by development. This status means, a team is working on the Practitest item (analysis or fixing)
Rejection Review	After Triage or review by developer the defect is not considered valid the defect will be assigned to the status of 'Rejection Review' and assigned to the participant whom raised the defect to accept rejection or update defect to allow it to be 'assigned'..
Rejected	Practitest item that is in a 'Rejection Review' status can be progressed to this state. If a participant accepts a defect is not valid they can confirm the acceptance of the defect by changing the status to 'Rejected'.
Fixed	Once Practitest item has been fixed and unit tested by developer the status is set to 'fixed'. This indicates the release of the fix is ready for deployment to a test environment.
Test Ready	Once the fix is released to test environment successfully the status is set to 'Test Ready' and assigned to the participant whom raised it.
Closed	If the participant (defect originator) is satisfied that the testing of the defect is successful they should update the defect

### 7.1.6 Defect process flow

Figure 3 below shows the defect management process throughout the various defect management statuses of the defect lifecycle from its inception through to its closure.

**Figure 2 Defect Management Cycle**



### 7.1.7 Defect 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 17 shows the available defect causes and their descriptions.

**Table 17 Defect cause**

Priority	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.
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.

## 7.2 Suspension criteria and resumption requirements

AEMO in consultation with the ITWG will determine if a complete or partial suspension of testing is required during market testing and will also determine when testing will continue. Suspension and resumption criteria and actions are described below.

### 7.2.1 Suspension criteria

Complete or partial suspension of testing may be required if:

- High density of defects is open impacting the number of test cases that can be executed
- High severity (i.e. showstopper) or combination of defects open
- Significant change to specifications (delaying release of software to the pre-production)
- Quality of software (rated by number of test cases failing)

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

- AEMO will make a recommendation to suspend the test activities in consultation with ITWG
- AEMO will advise the industry participants of the potential delays due to the test suspension, and the impact of defect / defects concerned
- AEMO and the ITWG will support and coordinate the development and test efforts to resolve the defects raised.

## 7.2.2 Resumption criteria

Test resumption can occur after the issues that caused the suspension of testing have been resolved.

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

- AEMO will inform the testing participants of the successful deployment of the defect fix(s) and its successful verification
- AEMO will inform the testing participants that the test environment is in a suitable condition to resume the suspended testing
- AEMO in consultation with the participant who raised the defect, will inform the participants of the impact(s) of the defect fix on the previously executed test cases and suggest if any re-execution must be done.

# Glossary

This document uses many terms that have meanings defined in the National Electricity Rules (NER). The NER meanings are adopted unless otherwise specified.

Term	Definition
5MS	Five-minute settlement
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
B2M	Business to market i.e. business to AEMO transactions
CR	Change request
Cutover	System implementation event
DNSP	Distribution network service providers
GS	Global settlement
Industry testing	Informal, uncoordinated testing by participants in AEMO's IT environments. Self-testing of functionality such as connectivity, and/or coordinated multi-party testing of functional scenarios.
Invitation industry testing	Coordinated testing of business process scenarios with a select number or subset of participants with systems ready for testing.
ITWG	Industry testing working group
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.
Market testing	Umbrella term covering industry testing, invitation industry testing and market trials
MC	Metering coordinator
MDFF	Meter data file format
MDMF	Meter data management format
MDP	Metering data provider
MP	Metering provider
MSP	Metering service provider – includes MPs, MDPs and MCs
MSATS	Metering, settlement and transfer solution

<b>Term</b>	<b>Definition</b>
NEM	National electricity market
NER	National electricity rules
NF	Non-functional
PCF	5MS program consultative forum
RWG	Readiness working group
SWG	Systems working group
Transition	Process of shifting from current to future operating state
UFE	Unaccounted for energy

# Appendix A1. 5MS Issue Triage Workflow

Figure 3 5MS issue triage workflow

