Enhancing Reserve Information (ERI) and ST PASA Recall Period

July 2025

Industry Testing Strategy

Important notice

Purpose

The industry testing strategy sets out the high-level approach and principles associated with the National Electricity Market (NEM) testing activities that will support the NEM Reform July 2025 release which comprises the ST PASA Recall Period and Enhancing Reserve Information (ERI) initiatives.

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Version control

Version	Release date	Changes
0.1	14/01/2025	Initial draft issued for internal discussion
1.0	31/01/2025	Final for Industry comment
1.1	28/02/2025	Minor update to section 2.2.1 (Market Registration). Updates to Schedule 3.1 form (bid and offer validation data) will not be available for the industry test but will be available prior to go-live.

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Contents

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1 Introduction

This chapter provides background information on AEMO's Enhanced Reserve Information (ERI) and ST PASA Recall Period July 2025 release, and sets out the purpose, scope, and approach to the development of this Industry testing strategy.

1.1 AEMO's ERI and ST PASA Recall Period Projects

1.1.1 Enhancing Reserve Information (ERI)

The Australian Energy Market Commission (AEMC) made a final determination in the ERI rule change on 21 March 2024. The Commission's final determination is not to implement an operating reserve market as it considers that:

- Based on extensive analysis, the existing market arrangements are sufficiently flexible to manage the potential for a transitory increase in reserve needs, and the current arrangements have met the need for reserves up to now.
- An operating reserve market would not offer any material performance improvements relative to the current arrangements and would introduce significant additional costs for customers.

In the absence of an operating reserve market, the Commission has made a final rule to further support the current arrangements to value reserves during the transition. The final rule will require the publication of information on energy availability in the operational timeframe, including:

- **State of charge:** The energy availability of batteries (i.e. state of charge in MWh) will be published close to real-time, aggregated by region, and the following trading day by Dispatchable Unit Identifier (DUID), to align with existing post-trading day publications.
- **Daily energy constraints:** The energy constraints of other scheduled plant types (hydro, gas, and coal) will be aggregated across all technologies and by region and published daily (at the start of each trading day).
- **Maximum storage capacity:** Storage participants will need to provide their maximum storage capacity (MWh) to AEMO in their bid and offer validation data.

1.1.2 ST PASA Recall Period

In May 2022, the AEMC made a final determination to amend the NER to introduce greater flexibility to the short-term projected assessment of system adequacy (ST PASA), revise some ST PASA definitions and obligations and require the commencement of the new ST PASA from 1 July 2025.

The National Electricity Amendment (Updating Short Term PASA) Rule 2022[1] (Amending Rule) introduced a principles-based approach for AEMO to administer ST PASA, included an obligation to publish a ST PASA Procedure, and make changes to ST PASA publication timetable, the definition of 'energy constraint', 'wholesale demand response constraint' and PASA availability in accordance with new NER 3.7.3.

In addition to the introduction of the principles-based framework for ST PASA, the final rule also:

- specifies that AEMO must publish forecasts of:

    - available capacity of individual scheduled generating plant and wholesale demand response units
    - PASA availability for individual scheduled generating units, scheduled loads, scheduled network service providers and wholesale demand response units
- specifies that ST PASA covers each 30-minute period (or such shorter period as determined by AEMO) in at least the seven trading days from and including the day of publication
- makes changes to the definition of energy constraint and PASA availability.

ST PASA is the tool that AEMO uses to forecast reliability and security conditions in the national electricity market up to seven days ahead of real time. AEMO is currently conducting a comprehensive review of the pre-dispatch PASA and ST PASA methodology in its ST PASA replacement project and is exploring the development of a system that will serve the NEM now and into the future.

1.2 Purpose of the industry testing strategy

This document offers stakeholders, specifically NEM participants, who will be affected by the changes, a clear understanding of the industry testing for the July 2025 ERI & ST PASA release. This will be a non-coordinated Industry Test and there will not be designated test scenarios/cases for market participants to test, however, market participants will be requested to test the in-scope items and report defects, if any found, back to AEMO during their testing through the NEM Reform email NEMReform@aemo.com.au or via the Q&A sessions.

This Industry test strategy document will help participants understand and plan for system, process and operational changes that will commence when ERI and ST PASA Recall period rules come into effect on 1 July 2025 and 31 July 2025 respectively.

1.3 Reference documents

The related documents mentioned in Table 1 and Table 2 are relevant to the industry testing strategy.

Table 1 ERI reference documents and web sites

#	Document name
1	Final determination of the ERI rule change
2	AEMO Project Site Enhancing Reserve Information (ERI) project
3	AEMO HLIA ERI High Level Implementation Assessment Final
4	AEMO Technical Specification EMMS 1 July 2025 Technical Specification
5	AEMO Technical Specification EMMS - Technical Specification - Data Model v 5.5 - April 2025

Table 2 ST PASA Recall Period reference documents and web sites

#	Document name
1	Final consultation determination https://www.aemc.gov.au/rule-changes/updating-short-term-pasa
2	AEMO Project Site ST PASA Procedure and Recall Period project

#	Document name
3	AEMO HLIA ST PASA Recall Period High Level Impact Assessment Final
4	AEMO Technical Specification EMMS - Technical Specification - Data Model v 5.5 - April 2025

1.4 Audience

This Industry testing strategy is primarily intended for all NEM participants affected by the ERI and ST PASA Recall Period initiatives, particularly their respective:

- Test managers
- Test leads
- Test analysts (system integration, UAT, industry testing)
- Project managers
- Developers and business and functional SMEs
- Market Participants

Secondary audiences within these businesses including:

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

2 Industry testing Framework

This section describes the framework that underpins the combined ERI and ST PASA Recall Period industry testing strategy. It explains the industry test strategy's objective, scope, assumptions, communications, data refresh, test environment and indicative timeline for the July 2025 release.

2.1 Industry testing objective

Industry testing provides market participants the opportunity to test their updated systems and processes against AEMO's updated systems.

In relation to the July 2025 release, the overall objective of industry testing is: *To support industry readiness and confirm AEMO's and participants' preparedness for the respective ERI and ST PASA Recall Period go-live dates.*

2.2 Industry testing scope

The July 2025 Release Industry test has two components, one for each of the ERI and ST PASA Recall Period initiatives. This decision to merge the industry test for the ERI and ST PASA Recall Period initiatives was made for the following reasons:

- The two initiatives will be deployed to pre-prod and production in one release.
- The rule effective dates for these initiatives both fall in July 2025 (1 July 2025 for ERI and 31 July 2025 for ST PASA Recall period).
- Both initiatives introduce changes to AEMOs Energy Market Management Systems (EMMS).
- Combining the two initiatives will bring test execution efficiencies for both AEMO and Industry Participants as there is considerable overlap in testing scope between the two initiatives.

Testing of the two initiatives can be performed concurrently and will be scheduled from 21 May 2025 to 17 June 2025.

The Technical Specification document EMMS - Technical Specification - Data Model v 5.5 - April 2025 should be considered as the source of truth and should be referred for the scope of the July 2025 release.

2.2.1 ERI testing scope inclusions

The approach to the ERI industry test will be to demonstrate that AEMO can ingest, process, and present the new ERI attributes in the following areas:

- Market Registration:
    1. Collect and maintain the Maximum Storage Capacity (MWh) data provided by participants to AEMO, subject to BAU timings.

2. Updates to Schedule 3.1 form (bid and offer validation data) will not be available for the industry test but will be available prior to go-live.

- Bids & Offers:
    1. Bidding System changes to the validation of bid Daily Energy Constraint, so that an energy bid is rejected if the Daily Energy Constraint ≥ registered Max Capacity x 24 hours, with an error message reported to the participant
    2. Impacted participants to upgrade their software and be able to submit a 'NULL' value for Daily Energy Constraint, to indicate that their generator is not constrained.
    3. Changes to support different CVP (constraint violation penalties).

- Market Schedule / Dispatch:
    1. AEMO to calculate aggregated daily energy limits (total availability) for scheduled generators and BDUs that are not batteries.
    2. Calculate aggregated State of Charge (SOC) by region for batteries.

- Publish Market Data - Publication of information on energy availability for each trading day which includes:
    1. Previous trading day's 5-min State of Charge (SOC) data for batteries (both Actual and Calculated SOC values) at the end of the trading day.
    2. Aggregated daily energy limits (total availability) for scheduled generating units
    3. Aggregated State of Charge (SOC) of batteries by region in each Trading Interval
    4. Publish aggregated energy availability data (for units other than batteries) via a new report in the Next Day reporting event in NEM Reports

2.2.2 ST PASA Recall Period testing scope inclusions

The approach to the Recall Period component of the ST PASA Recall Period industry test will be to demonstrate that Recall Period data for the associated PASA availability can be provided by Participants, ingested by AEMO and presented by AEMO in the following areas:

- Bids & Offers
    1. Participants to be able to supply Recall period for the associated PASA availability for each trading interval via the normal bids
    2. Scheduled resources to be able to provide the Bid Max Avail, PASA Avail and Recall Period in the short-term time frame

- Publish Market Data
    1. Forecasts of the available capacity of individual scheduled generating plant, wholesale demand response unit and BDUs
    2. Forecasts of PASA availability for individual scheduled generating units, scheduled loads, scheduled network service providers and wholesale demand response units
    3. Load forecasts at a range of probability of exceedance levels
    4. Period to be covered by the short term PASA in each 30-minute period in at least the seven trading days from and including the day of publication
    5. At the end of the trading day, publish 'Recall Period' from all bids for the previous trading day

2.2.3 Scope exclusions

Industry testing scope exclusions:

- Testing of any functionality not mentioned in the respective scope sections of this document should be considered out of scope.
- 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.
- Downstream business procedures for each industry participant.
- Accreditation, as there is no accreditation for the July 2025 releases

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.

2.3 Assumptions

There are several key assumptions underpinning the industry testing strategy:

1. AEMO will provide and maintain the single Pre-Production environment which will be used for industry 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 industry testing.
3. As part of any changes to Pre-Production, AEMO will give notice to participants of outages or code changes and provide release notes for the changes.
4. The next refresh of Pre-Production environments is scheduled for 24 February 2025 to 28 February 2025. The refresh will be sourced from production snapshots taken on the following dates:
    - Wholesale System Production snapshot to be taken on the morning of 14 February 2025
    - Retail System Production snapshot to be taken on the morning of 24 February 2025. This refresh will contain 6 months of meter data.

5. AEMO will perform all internal functional testing prior to the release of any changes into pre-production for all the July 2025 release operation changes that AEMO is coordinating.
6. Participants will perform testing on any internal application changes prior to connecting to the AEMO pre-production environment.
7. Participants will have appropriately skilled resource capability for execution and support requirements during industry testing.
8. AEMO will provide support to investigate and resolve defects identified during industry test. All participants engaging in industry testing will report any defects to AEMO by sending an email to NEM Reform inbox: NEMReform@aemo.com.au
9. Results from industry testing may be used by participants for their own assessment of go-live criteria.
10. AEMO will support participants to resolve any connectivity issues within the pre-production environment.

2.4 Communication and Q&A session approach

Commencement of Q&A sessions will be aligned with the test execution for industry testing. These Q&A sessions will be in the form of meetings with below details:

- Scheduled twice weekly for 30 minutes in duration for Participants who seek clarifications or discussions related to industry testing for the duration of the industry test.
- Meetings will be recorded for action taking purposes.
- Questions not answered during the meeting will be taken away and answered following the meeting.
- Ad hoc meetings can be organised between 09:00 and 17:00 Hrs (AEST) on business days, for any defects which needs prioritized attention.
- Latest defect updates, if any, will be sent out after the sessions as part of defect reporting.

Table 3 describes how the progress of industry testing will be monitored and reported. Communications and defect reporting will involve both AEMO and participants.

Table 3 Communications and Q&A session approach

Frequency	Type	Responsible
Twice weekly	• Combined ERI & ST PASA Recall Period Q&A sessions – 20 May 2025 to 17 June 2025 • Defect reporting via email	AEMO and Participants
Ad hoc	• Defect related meetings will be organised for the defects which needs prioritized attention • Issues in accessing Pre-Production environment	AEMO and Participants

2.5 Data refresh

AEMO's Pre-Production retail and wholesale environments will be refreshed between 24 February 2025 and 28 February 2025. The wholesale data will be taken from a copy of Production on 14 February 2025. The Retail data will be taken from a copy of Production on 24 February 2025 with 6 month's meter data.

2.6 Test environment: AEMO pre-production

AEMO will prepare and maintain the single pre-production environment prior to the commencement of Industry testing. Any testing related support for the July 2025 Release in the pre-production environment will be provided between 09:00 and 17:00 Hrs (AEST) on business days by sending an email to NEM Reform inbox: NEMReform@aemo.com.au and via the scheduled Q&A sessions. Pre-production environment and access issues can be raised directly via the AEMO support hub.

2.7 Timeline

The Timelines for the industry testing of the ERI & ST PASA Recall Period project are shown in Figure 1 and Figure 2 respectively. Key milestones for the projects are shown on Table 3, below.

Figure 1 ERI project timeline

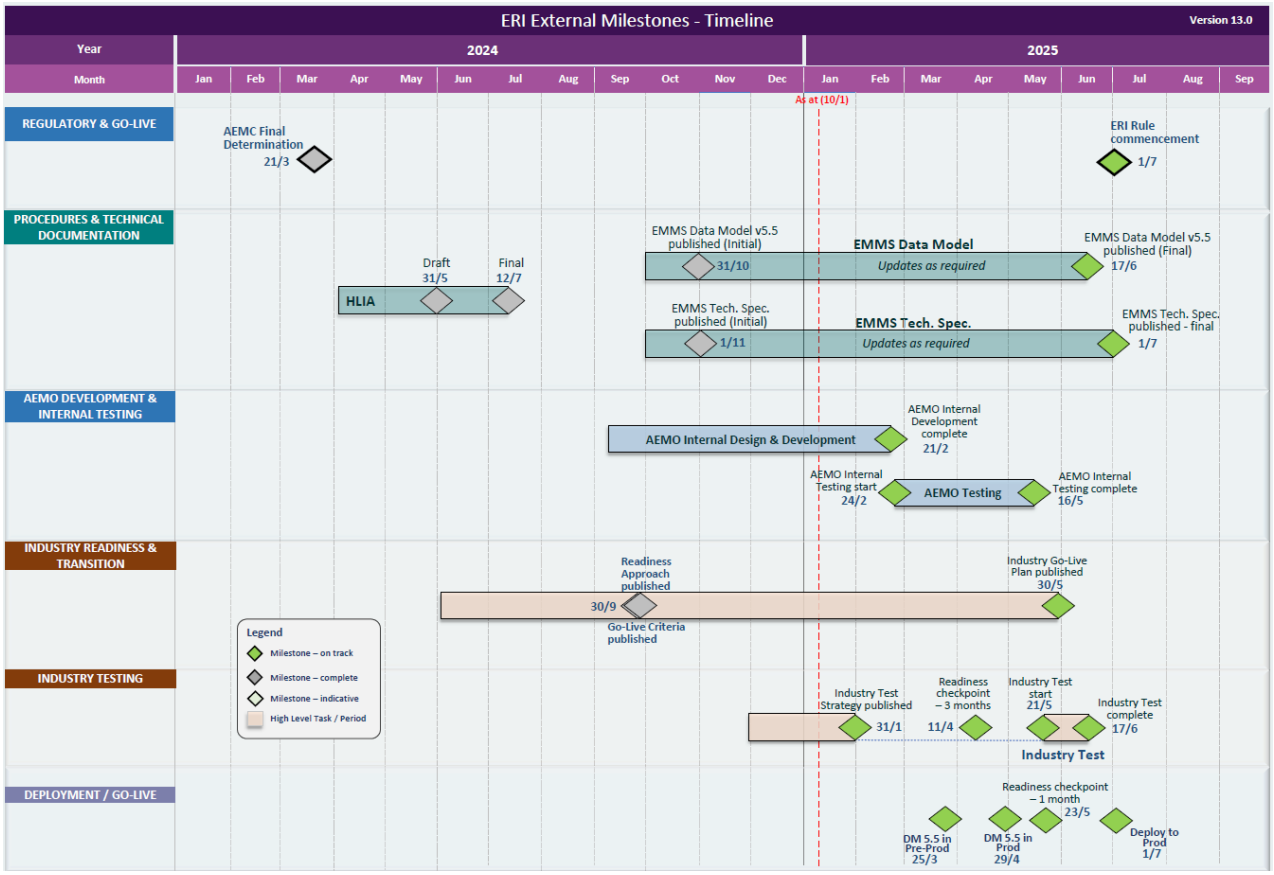


Figure 2 ST PASA Recall Period project timeline

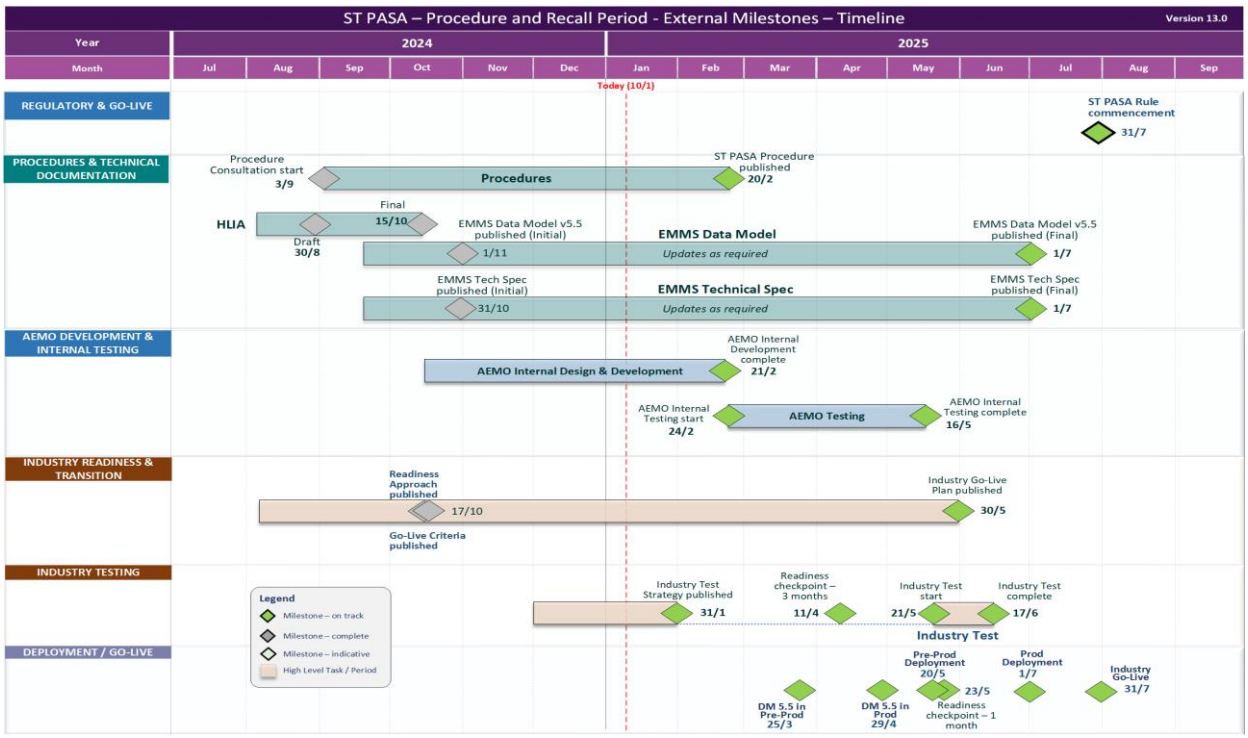


Table 4 ERI & ST PASA Recall Period project milestones

Milestone	Date
EMMS Data Model 5.5 (Draft)	31-Oct-2024
EMMS Tech Spec (Draft)	1-Nov-2024
EMMS Data Model 5.5 (Final)	17-Jun-2025
EMMS Tech Spec (Final)	1-July-2025
Industry Test Strategy published (Final)	31/01/2025
Industry Test Plan published	NA
DM 5.5 Pre-Production Release	25-March-2025
DM 5.5 Production Release	29-April-2025
Industry Test start	21-May-2025
Industry Test finish	17-Jun-2025
EMMS Production Release	1-July-2025
ERI Rule Commencement Date	1-July-2025
ST PASA Recall Period Rule Commencement date	31-July-2025

3 Defect management

Industry testing defect management will be a collaborative effort, principally involving AEMO's and participants' testing teams, development teams and business analysis teams.

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.

Participants can report the defects to AEMO by sending an email to NEM Reform inbox NEMReform@aemo.com.au and AEMO will manage all the defects that were identified during test execution. Ad hoc meetings can be organised between 09:00 and 17:00 Hrs (AEST) on business days, for any defects which need prioritized attention for resolution. Defects identified by Participants that are not a result of the July 2025 Release changes will be raised with the relevant AEMO BAU support team for prioritisation and action. Where it is determined that it is not an AEMO defect, AEMO will coordinate with market participants to obtain the status of the defect.

3.1 Defect management approach

3.1.1 Raising defects

Defects reported by participants during industry testing will be captured by AEMO's test team in Jira, with the following information:

- Description of defect
- Who detected it and the date it was detected
- Defect owner (entered after gaining agreement as to who owns the defect)
- Target fix date (entered by defect owner)
- Defect severity
- Defect priority
- Defect status
- Defect root cause (entered by defect owner).

3.1.2 Defect escalation and triage

All open defects will be discussed in the weekly meeting. If a critical/high priority defect can't be resolved within the agreed timeframes, it can be escalated in the same meeting.

Defect triage meetings will be held internally in AEMO to discuss the status of any reported defects. Defects report will be shared with participants prior to the weekly meeting.

3.1.3 Defect severity and 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, as described in Table 6. 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, as described in Table 5.

Table 5 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 some 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 workarounds available, with testing 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 6 Defect priority classification

Priority	Definition
1- Blocker	Entire functionality is blocked, and no testing can be conducted. Fix/resolution turnaround time best endeavour effort in first 4 hours or provide update on impact.
2-Highest	Defect is considered high impact to testing; multiple tests are blocked/failed due to the defect and no workaround is available
3-High	Defect is considered high impact to testing one or more tests can be linked to the defect, but workaround is available, and testing is still able to continue.
4-Medium	Defect is considered moderate impact to testing with one or more tests can be linked to the defect, but workaround is available and none of these tests are currently a priority.
5-Low	Defect is considered low impact to testing, no tests are failed or blocked due to this defect.

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

3.1.4 Defect cause

Defect root cause of a valid defect will be updated in Practitest by AEMO's test team once the defect cause is identified. Table 7 shows the available defect causes and their descriptions.

Table 7 Defect cause

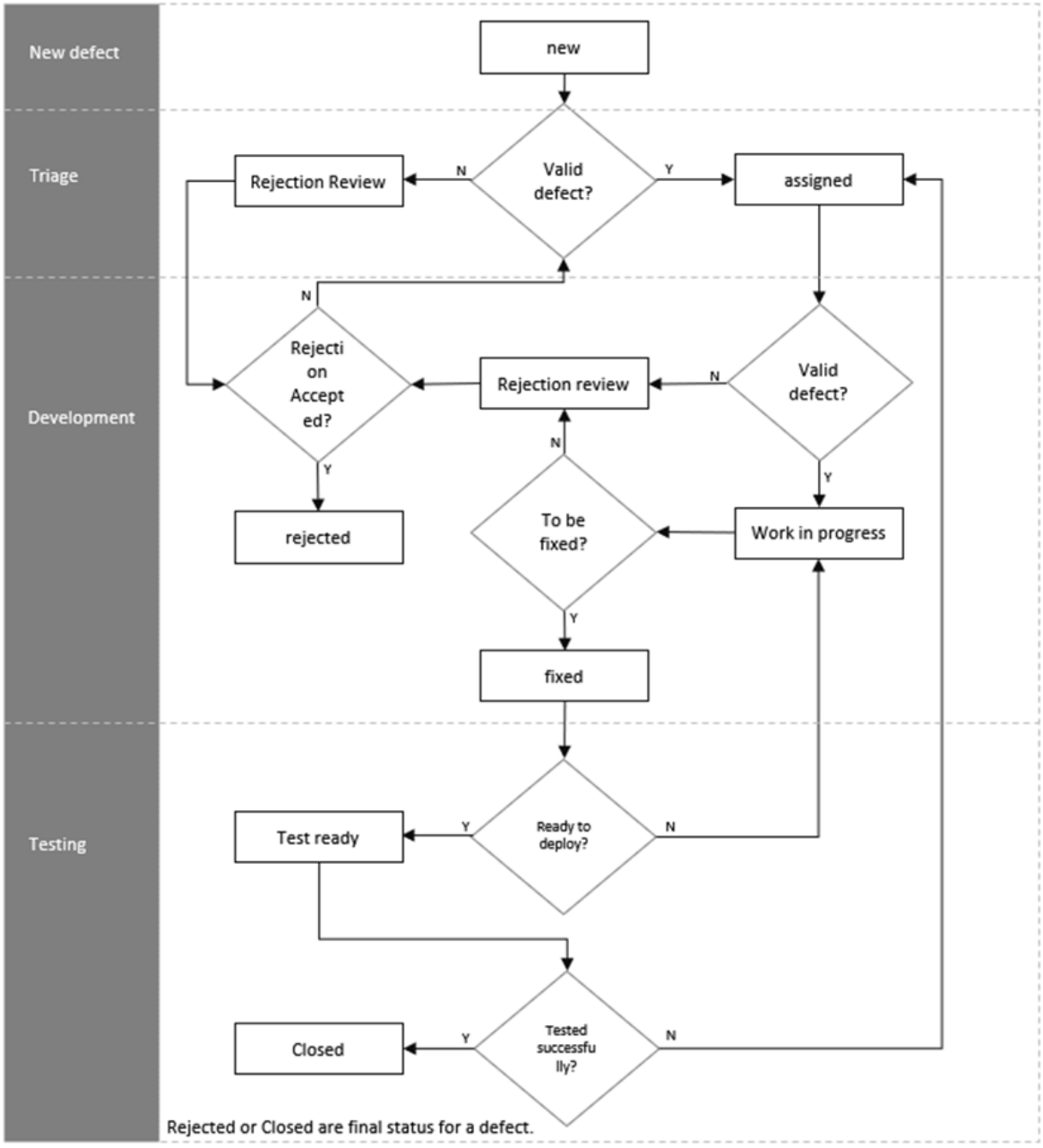
Defect Cause	Definition
Design	The design of the process does not meet the requirements specified. Defect may include examples, algorithm (incorrect calculation), error handling, creation/release of object or memory, decision logic error, loop control, procedure call, failing to validate data values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

Defect Cause	Definition
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.

3.1.5 Defect process flow

Figure 2 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



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
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
API	Application programming interface
BDU	Bi-Directional Unit
BCM	Business Capability Model
CVP	Constraint Violation Penalties
DEC	Daily Energy Constraint
DI	Dispatch Interval
DUID	Dispatchable unit identifier
EMS	Energy Management System
EMMS	Electricity Market Management System
ERI	Enhancing Reserve Information
MW	Megawatt
MWh	Megawatt hour
NEM	National Electricity Market
NER	National Electricity Rules
NEMDE	National Electricity Market Dispatch Engine
PD / Pre-Processing	Pre-dispatch or other known as 'Pre-Processing' feeds into 'NEMDE'
Post Processing	Process after 'NEMDE'
P5min	5min Pre-Dispatch
RMC	Registration Manager Client
SCADA	Supervisory Control And Data Acquisition
SNOW	Service Now
SOC	State Of Charge, energy availability of batteries (i.e. state of charge in MWh)
SOC (actual)	Initial Energy Storage at the start of a Trading Interval (TI)
SOC (calculated)	Calculated State Of Charge is the Energy Storage value at the end of a Trading Interval (TI)
Trading day	The 24-hour period from 0400 hrs to 0400 hrs the following day
TDU	Tactical Dispatch Unit
TI	Trading Interval
Trading Interval (TI)	A period for which AEMO settles trading amounts in the NEM. A trading interval is defined in the Rules as a 5-minute period.