POWER OF CHOICE IMPLEMENTATION PROGRAM

INDUSTRY TEST STRATEGY (VERSION 1.0)

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AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

VERSION RELEASE HISTORY

Version	Date	Summary of Changes
0.1	06/02/2017	First draft issued for discussion with the Power of Choice – Industry Test Working Group (POC-ITWG)
0.2	24/03/2017	Second draft issued, incorporating POC-ITWG feedback received on Version 0.1
1.0	10/05/2017	Industry Test Strategy finalised as Version 1.0, incorporating POC-ITWG feedback received on Version 0.2

EXECUTIVE SUMMARY

The Australian Energy Market Operator (AEMO) and industry participants are currently implementing a major electricity retail market reform package, commonly referred to as the Power of Choice (POC) reforms.

The POC reforms originate from the Australian Energy Market Commission's (AEMC) POC Review. Following publication of the Review's final report in November 2012, several related energy market rule changes, reviews and expert advice have been completed or are under development. The rule changes, which "go-live" on 1 December 2017, have amended and/or imposed new regulatory obligations on certain National Electricity Market (NEM) stakeholders.

For AEMO and NEM participants, this has prompted a major implementation work program to amend and/or create NEM procedures, business systems and supporting processes in preparation for the "go-live" date for the revised market arrangements. AEMO is playing a key coordination role in this work, in collaboration with its industry working groups, to prepare industry and itself for the "go-live" date.

AEMO's POC Implementation Program covers procedural, technical and readiness work streams. The readiness work stream is responsible for developing AEMO's Market Readiness Strategy, where "market readiness" refers to the successful implementation of all necessary activities by AEMO and NEM participants required for a seamless transition to new rule and procedural arrangements.

As referenced in the 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 the updated procedures.

The purpose of the Industry Test Strategy is to define the scope, approach, process, responsibilities and high-level schedule of the industry testing phase.

This paper sets out AEMO's final Industry Test Strategy incorporating feedback received from industry stakeholders.

This paper is structured as follows:

- Chapter 1 introduces the purpose, scope, and approach to the development, of the Industry Test Strategy.
- Chapter 2 details the key dates and milestones of the industry testing planning and execution phases.
- Chapter 3 details the scope and objective of industry testing.
- Chapter 4 details the high-level test management approach.
- Chapter 5 details the industry testing preparation activities and approach.
- Chapter 6 details the entry and exit criteria and test execution approach.
- Chapter 7 details the defect management approach.

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1. INTRODUCTION

This chapter provides background information on AEMO's POC Implementation Program, and sets out the purpose, scope and approach to the development of the Industry Test Strategy.

1.1 AEMO's POC Implementation Program

The objective of AEMO's POC Implementation Program is to design and implement required changes to electricity metering, retail market arrangements and infrastructure to give effect to rule changes arising from the POC Review.[1]

To facilitate implementation of the Program, AEMO has established three work streams:

- Procedure Development – to define the required changes to electricity retail market procedures.
- Technical Development – to design, develop, implement and test changes to AEMO's retail market systems.
- Market Readiness – to coordinate, assist and prepare NEM participants and AEMO for the start of the revised market arrangements, and to monitor and report on the preparation efforts.

This paper only considers matters that relate to **Industry Testing** under the Market Readiness work stream. Further information on the Program, including past industry meeting papers, is available on the POC section of AEMO's website.[2]

1.2 Definition of industry testing

Throughout this document, "industry testing" refers to the testing of NEM participant's market interfacing systems with AEMO's market systems, in order to test updates made to these systems to comply with the new procedural arrangements effective from 1 December 2017 (that is, the scheduled "go-live" date for the POC reforms). In this document "industry testing" is used as an umbrella term to describe testing between NEM participants and AEMO and includes periods of:

- Industry Test – self-testing of functionality (e.g. connectivity) and/or coordinated multi-party testing of functional based scenarios (e.g. testing a single change request (CR)).
- Market Trial – coordinated multi-party end-to-end testing of business process scenarios (e.g. a new connection involving both CRs and services orders)

1.3 Purpose and scope of the Industry Test Strategy

A key document under AEMO's Market Readiness Strategy is this Industry Test Strategy. This section sets out the purpose and scope of this Strategy.

1.3.1 Purpose of the Industry Test Strategy

The purpose of the Industry Test Strategy is to set out a plan for managing, coordinating, monitoring and reporting on AEMO's and NEM participants' industry testing activities and results.

Industry Test Strategy and associated Test Plans

This Industry Test Strategy is a high-level document that details the testing approach that applies to the entire POC industry testing phase. This Strategy will be supported to by individual Test Plans containing details specific to each of the three phase of industry testing:

- Phase 1: Industry Test (EN/MC) – B2M
- Phase 2: Industry Test (B2B)

[1] See AEMC website, http://www.aemc.gov.au/Major-Pages/Power-of-choice.
[2] See AEMO website, http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Power-of-Choice.

- Phase 3: Market Trial – B2M and B2B

The Test Plans may also consist of a number of supporting materials, including detailed workbooks, calendars, checklists and templates.

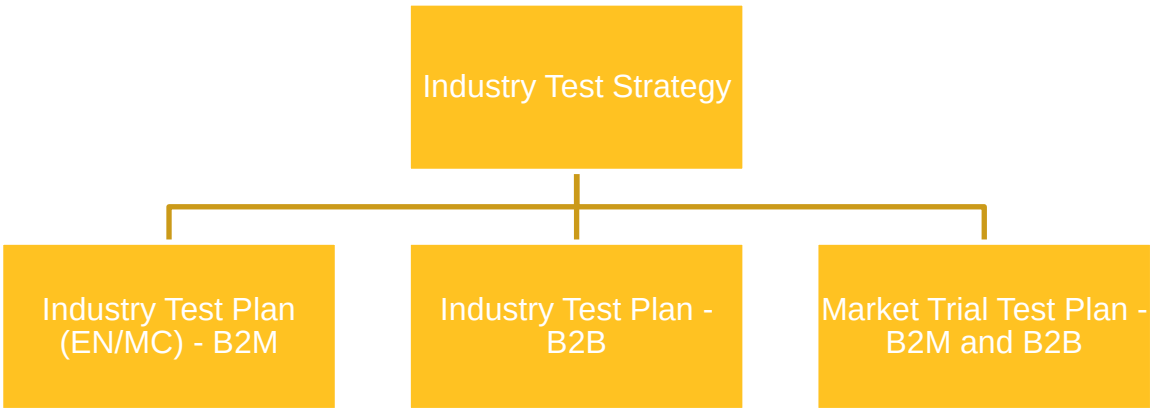

Figure 1– Industry Test Strategy and associated Test Plans

1.3.2 Scope of the Industry Test Strategy

The POC related rule changes are relevant to this Industry Test Strategy and are listed below:[3]

- Expanding Competition in Metering and Related Services (MC) rule change.[4]
- Meter Replacement Processes (MRP) rule change.[5,6]
- Embedded Networks (EN) rule change.[7]
- Electricity B2B Framework (B2B) rule change.[8]

1.4 Approach to development of the Industry Test Strategy

1.4.1 Utilise the POC Industry Test Working Group

AEMO will collaborate with NEM participants on the development of the Industry Testing Strategy and associated Test Plans via the POC Industry Testing Working Group (POC-ITWG).[9]

In order to develop the Industry Test Strategy and associated Test Plans in a timely manner, AEMO and NEM participants must take all reasonable steps to provide continuity of representation at POC-ITWG meetings, ideally with:

- A detailed understanding of the retail electricity market and POC program.
- Experience in developing test strategies and test plans, and managing and coordinating testing programs.
- Authorisation to consider matters, and provide views and commitments, on behalf of their organisation.

[3] See AEMC website, Power of Choice overview page, http://www.aemc.gov.au/Major-Pages/Power-of-choice.
[4] Rule made; AEMC final rule determination published 26 November 2015.
[5] Rule made; AEMC final rule determination published 10 March 2016.
[6] Note that there are no system changes associated with the MRP rule change.
[7] Rule made; AEMC final rule determination published 17 December 2015.
[8] Rule made; AEMC final rule determination published 30 June 2016.
[9] See AEMO website, http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Power-of-Choice/Readiness-Work-Stream/Industry-Test-Work-Group

Each participant is expected to provide an industry test lead (and a delegate if required) to be part of the ITWG for the duration of industry testing preparation and execution activity. It is expected that these resources will be adequately skilled to meet the needs of the preparation and execution activities. AEMO will facilitate and chair the ITWG forums.

As per its term of reference, POC-ITWG working group members will be responsible for:

- Development of the Industry Test Strategy and Plans.
- Internal communication of the Industry Test Strategy and Plans within their represented organisation.
- Coordination of their internal testing teams to align with the activities in this Strategy and the associated Test Plans, including test planning, preparatory activities (preparing test scenarios and scripts, test calendars), actual test execution, defect management and progress reporting.

1.4.2 Updates to the Industry Test Strategy

The key milestones table (Section 2) lists the scheduled review points for the Industry Test Strategy.

1.5 About this paper

1.5.1 Structure of this paper

This paper is structured as follows:

- Chapter 2 details the key dates and milestone for the industry testing planning and execution phases.
- Chapter 3 details the objective and the high-level scope of each of the three phases of industry testing.
- Chapter 4 details the high-level test management approach, including roles and responsibilities, testing management tools, reporting, and risk and issues management.
- Chapter 5 details the high-level test planning phase.
- Chapter 6 details the entry and exit criteria and text execution approach.
- Chapter 7 details the defect management approach.

1.5.2 Reference documents

The following POC-related documents are relevant to the Industry Test Strategy and are available on the AEMO website under Power of Choice.

#	Document Name
1	POC Market Readiness Strategy[10]
2	AEMO Procedures, as approved by AEMO under the following NER Consultations: • POC Procedure Changes (Package 1)[11] • POC Procedure Changes (Package 2)[12]
3	B2B Procedures, as approved by the IEC under the following NER Consultation: • POC - B2B Procedure Changes[13]
4	MSATS 46.88 Technical Specification and MSATS 46.89 Technical Specification[14]

[10] See AEMO website, http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Power-of-Choice/Readiness-Work-Stream.
[11] See AEMO website, http://aemo.com.au/Stakeholder-Consultation/Consultations/Power-of-Choice---AEMO-Procedure-Changes-Package-1
[12] See AEMO website, http://aemo.com.au/Stakeholder-Consultation/Consultations/Power-of-Choice---AEMO-Procedure-Changes-Package-2
[13] See AEMO website, http://aemo.com.au/Stakeholder-Consultation/Consultations/Power-of-choice---B2B-Procedures---Final-Report-and-Determination
[14] See AEMO website, http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/IT-systems-and-change/IT-change

#	Document Name
5	SMP Technical Guide Document[15]
6	POC Risk and Issue Management Plan[16]
7	POC Industry Registration & Accreditation Plan[17]

1.5.3 Audience

This Industry Test Strategy is intended for the following audiences:

- All NEM participants impacted by the POC reforms, such as, retailers, distributors, metering service providers and embedded network managers.
- Test Manager, Test Leads, Test Analysts (system integration, UAT, Industry and Market Trials) and Project Managers.
- Developers, Business and Functional SMEs.

Secondary audience includes the following groups:

- Development Managers
- IT Operations Team
- Change Controllers
- Operations Team

1.5.4 Acronyms

Acronym	Description
AEMO	Australian Energy Market Operator
B2B	Business to Business
B2M	Business to Market
CATS	Consumer Administration and Transfer Solution
ENM	Embedded Network Manager
ENSP	Embedded Network Service Provider
M2B	Market to Business
MC	Metering Competition
MRP	Meter Replacement Processes
MSATS	Market Settlements and Transfer Solution
PCF	Program Consultative Forum
SMP	Shared Market Protocol
RWG	Readiness Working Group
ITWG	Industry Testing Working Group
NF	Non – Functional

[15] See AEMO website, http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Power-of-Choice/Systems-Work-Stream
[16] See AEMO website, http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Power-of-Choice/Program-Management
[17] See AEMO website, http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Power-of-Choice/Readiness-Work-Stream

2. KEY DATES AND MILESTONES

AEMO's Market Readiness Strategy details the key milestones for the POC Implementation Program and the Market Readiness workstream.

Key milestones for the development of the Industry Test Strategy are presented in Table 1 and the industry testing timeline is shown in Figure 2.

Table 1 – Key milestones

#	Milestone	Indicative date/s	Participant
1	AEMO circulates: - Industry Test Strategy – first draft - Phase 1: Industry Test Plan (EN/MC) – first draft	6 February 2017	AEMO
2	POC-ITWG meeting –review first drafts: - Industry Test Strategy - Phase 1: Industry Test Plan (EN/MC)	13 February 2017	All
3	Participant feedback due on first draft - Industry Test Strategy - Phase 1: Industry Test Plan (EN/MC)	20 February 2017	All
4	POC ITWG meeting – discuss feedback and next steps for: - Industry Test Strategy - Phase 1: Industry Test Plan (EN/MC) – planning and registration	7 March 2017	All
5	MSAT pre-production release of B2M schema r35 and associated EN/MC changes	22 March 2017	AEMO
6	POC-ITWG meeting – review second drafts: - Industry Test Strategy - Phase 1: Industry Test Plan (EN/MC)	5 April 2017	AEMO
7	AEMO outage for data refresh (production data from 30 March 2017 at 15:00 hrs AEST)	6 April - 10 April 2017	AEMO
8	AEMO circulates final drafts (with participant feedback incorporated): - Industry Test Strategy - Phase 1: Industry Test Plan (EN/MC)	12 May 2017	AEMO
9	POC-ITWG meeting: - Review first draft Phase 2: Industry Test Plan (B2B) - Commence planning for Phase 3: Market Trial	12 May 2017	All
10	Phase 1: Industry Testing (EN/MC) – execution	23 May 2017 – 30 June 2017	All

#	Milestone	Indicative date/s	Participant
11	Phase 2: Industry Test Plan (B2B) finalised	5 June 2017	AEMO
12	Phase 3: Market Trial Test Plan finalised	30 June 2017	AEMO
13	Phase 2: Staged release of schema R36 into the pre-production environment	From June 2017	AEMO
14	Phase 2: B2B Test execution commencement	June 2017 -– July 2017	All
15	Phase 3: Market Trial Test Workbook finalised	End of July	All
16	AEMO outage for data refresh (proposed date of production data from 3 August at 15:00 hrs AEST[18])	7 August - 14 August 2017	AEMO
17	**Phase 3: Market Trial Full pre-production release**	**21 August 2017**	**AEMO**
18	Phase 3: Market Trial execution	21 August 2017 – 3 November 2017	All
19	Final Market Trial Test Completion Report	Mid-November 2017	AEMO
20	"Go-live" date for POC reforms	1 December 2017	All

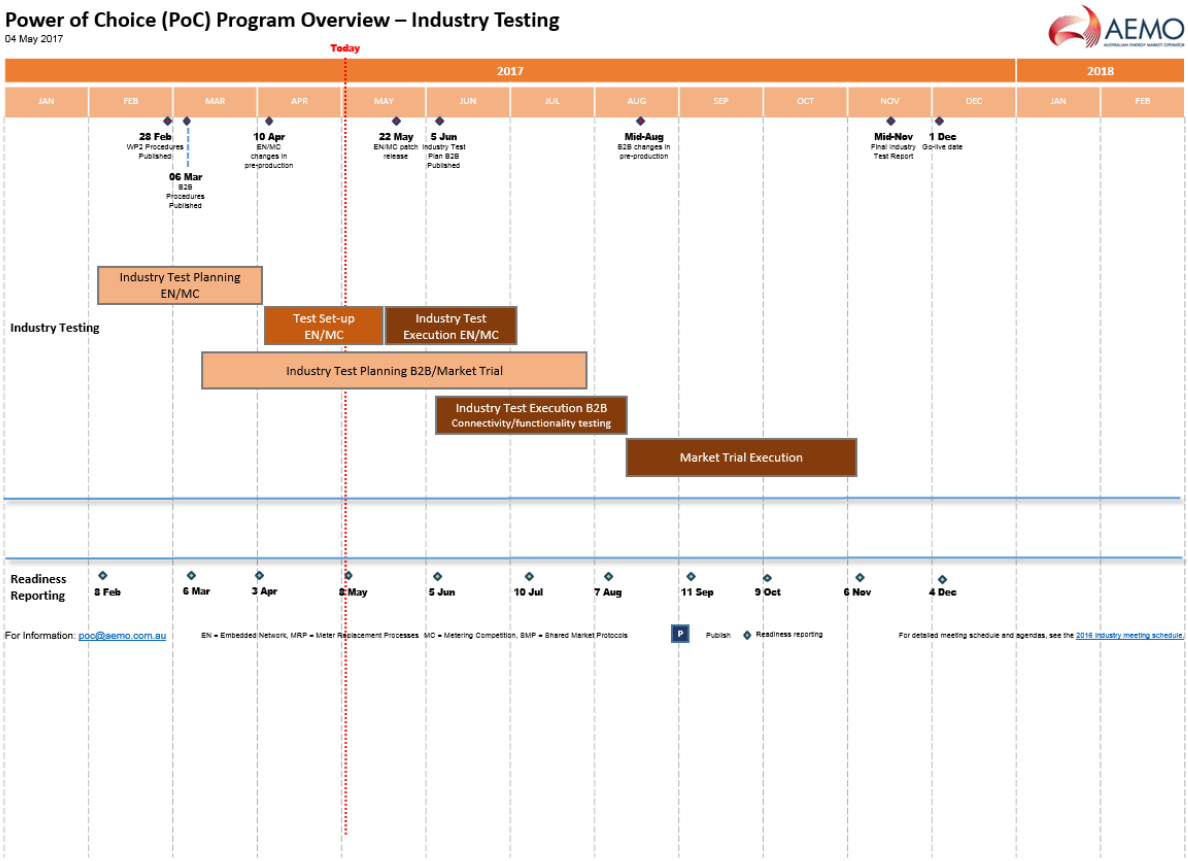

Figure 2– Industry Testing Timeline

[18] Date of production data will be confirmed in the Market Trial Test Plan

3. SCOPE AND OBJECTIVES OF INDUSTRY TESTING

3.1 Industry testing objectives

The overall objective of industry testing is to confirm industry's operational preparedness for the "go-live" date by providing market participants the opportunity and tools to test their updated systems and processes against the updated electricity retail market procedures.

3.2 Industry testing key principles

Industry 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. Adherence to the Industry Test Strategy and associated Tests Plans: all parties participating in industry testing must use their best endeavours to adhere to the Industry Test Strategy and Plans – including meeting key dates, fulfilling entry criteria checklist, adhering to defect management guidelines and reporting guidelines.
2. Appropriately skilled resource capability: all parties participating in industry testing must be appropriately resourced for the test planning and test execution effort.
3. 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.
4. Focus on the overall objective (reliability, safety and security of supply to end-use customers): all parties participating in industry testing should be committed to cooperating with each other and be prepared to be responsive and flexible when responding to events.

3.3 Industry testing scope

Industry testing will consist of system integration testing between NEM participants, to test their system changes as required under the MC, MRP, EN and B2B rule changes. The Test Plans for each of the three phases of industry testing will detail the scope inclusions and exclusions for that phase.

3.3.1 Scope inclusions

Industry testing scope inclusions:

- Industry capability based technical, functional and business operational testing as follows:
  - Industry technical verification and validation:
    - Determines the technical state of the solution e.g. schema validations, connectivity and provided interfaces.
  - Industry 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.
  - Industry 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 including but not limited to transfers and service orders.

3.3.2 Scope exclusions

Industry 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).
- 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.
- 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.

3.4 Industry testing phases

The high-level objective and timeframes of each of the three industry testing phases are detailed below. Refer to the individual Test Plans for more details.

3.4.1 Phase 1: Industry Test (EN/MC) – B2M

Phase 1 of the industry testing will be focused on any Business to Market (B2M) system changes due to the EN and MC rule changes to the following:

- MSATS procedures:
  - Consumer Administration and Transfer Solution (CATS)
  - Wholesale, Interconnector, Generator and Sample (WIGS)
- National Metering Identifier (NMI) standing data schedule

This phase will be detailed in the Industry Test Plan (EN/MC). Participation in the Industry Test (EN/MC) is voluntary.

Objective

Providing market participants, who are ready to participate in early testing, the opportunity and tools to verify:

- Technical compliance against the updated electricity retail market procedures from package 1 and package 2 procedure changes.
- Technical compliance against the related aseXML schema (B2M R35) changes.[19]

Providing an opportunity to reduce the identified risk associated with the compressed industry test timeframe:[20]

- Identifying and fixing defects in AEMO's and participating parties' systems.
- Setting up and trialling structures and processes that can be expanded and used during the full Phase 3: Market Trial.

Participants who do not take part in the Phase 1: Industry Test (EN/MC) will have an opportunity to undertake the B2M test scenarios during Phase 3: Market Trial.

[19] Sample aseXML documents also available, see http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/IT-systems-and-change/aseXML_standards/aseMXL-Document-Samples

[20] See the POC Industry Risk and Issue log – risk R11, see http://www.aemo.com.au/-/media/Files/Electricity/NEM/Power-of-Choice/PM/PoC-Industry-Register.xlsx

Timeframe

Test execution for this phase will commence from 23 May 2017 and will complete on 30 June 2017. Participants who are ready prior to May can perform their own tests (e.g. transactional testing, aseXML schema validation) in the same pre-production environment (available from 10 April).

3.4.2 Phase 2: Industry Testing (B2B)

Phase 2 of the industry testing will be focused on B2B R36 schema validation and connectivity testing to the new web service API. This phase will be detailed in the Industry Test Plan (B2B). Participation in the Industry Test (B2B) is voluntary.

Objective

Providing market participants, who are ready to participate in early testing, the opportunity and tools to verify:

- Technical compliance against the related aseXML new B2B schema R36.
- Connectivity testing to MSATS Pre-Prod and e-hub and verifying APIs.

Providing an opportunity to reduce the identified risk associated with the compressed Market Trial timeframe by:

- Identifying and fixing defects in AEMO's and participating parties' systems.
- Confirming connectivity.

Timeframe

Test window for this phase will commence from early June 2017, and will complete at the end of July 2017.

3.4.3 Phase 3: Market Trial (B2B and B2M)

Phase 3 will include testing for all POC-related rule and procedure changes. This phase will be detailed in the Market Trial Test Plan.

Objective

Providing market participants the opportunity and tools to verify:

- Technical, functional and operational verification and validation against all B2B and B2M system changes under all POC-related rule and procedure changes, including system changes due to changes to the following procedures:
  - Customer and Site Details Notification Process
  - Meter Data Process
  - Service Order Process
  - One Way Notification Process
  - Consumer Administration and Transfer Solution (CATS)
  - Wholesale, Interconnector, Generator and Sample (WIGS)
  - National Metering Identifier (NMI) standing data schedule

Provide a demonstration of the industry's operational readiness for go-live operation by:

- Participants conducting end-to-end business processes against multiple participants

Timeframe

Phase 3: Market Trial will commence from mid-August when all system changes will be available in the pre-production environment (including the production data cut and refresh). This phase of testing is proposed to include three cycles, with indicative dates as follows:

- Cycle 1: 21 August to 8 September
- Cycle 2: 18 September to 6 October
- Cycle 3: 16 October to 3 November

3.5 Assumptions

1. AEMO will provide and maintain the single Pre-Production environment which will be used for all industry testing phases (including the Market Trial).
2. Package 1, Package 2 and B2B Procedures are documented and approved prior to the commencement of industry testing.
3. AEMO will back-up production data and upload into the pre-production environment prior to the initial phase of industry testing and again prior to the commencement of the Market Trial. AEMO will communicate the details and dates of this activity to all participants.
4. AEMO will upload the test case from the workbook in HP SaaS QC, and provide support of the HP SaaS QC during the industry testing.
5. AEMO will perform all internal functional and non-functional testing prior to release of any changes in pre-production for phase 1, and in parallel to the Market Trial.
6. Participants will register their interest with AEMO for the industry 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 industry testing.
9. Participants will ensure that the appropriate pre-production environment is in place to support industry testing requirements.
10. Participants will ensure that defined test data is available within their test environments for industry testing and that this data is appropriately baselined and backed up.
11. All participants will use HP SaaS QC to document requirements and create and execute test cases, defect management and dashboard reporting.
12. Results from industry testing will be used by participants as one factor in their assessment of market readiness criteria.
13. Any testing activities required during transition will be detailed in the POC Industry Transition and Cutover Plan.

4. INDUSTRY TESTING MANAGEMENT

4.1 Roles and responsibilities

This section details the roles and responsibilities of the POC working groups involved in AEMO's POC Implementation Program throughout the industry testing planning and execution phases.[21]

4.1.1 POC-ITWG

AEMO and Participant Test leads on the POC-ITWG will be responsible for:

- Developing all test preparation materials, including test scenarios, test scripts and data sets, and populating HP SaaS QC with test steps, as required.
- Submitting test registration requests, entry and exit criteria checklists, software or connectivity requests to AEMO, when requested.
- Managing the testing process as prescribed in this Industry Testing Strategy and the supporting Test Plans, including:
  - Undertaking test execution as scheduled.
  - Updating HP SaaS QC with test progress and results.
  - Communicating with testing counterparties as required.
  - Attending scheduled stand-up and ad-hoc meetings.
  - Adhering to the defect management process including the retesting of fixed defects.

The POC-ITWG facilitator and chair (AEMO's test lead), in addition to the above responsibilities, will be responsible for ensuring the following activities:

- Coordinating the test preparation activities.
- 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.
- Coordinating test counterparties (e.g. arranging pairings or grouping for test scenarios).
- Coordinating the test execution process as prescribed in this Industry Testing Strategy and the Industry Test Plans including:
  - Scheduling and chairing regular stand-up and ad-hoc meetings.
  - Communicating test readiness (i.e. giving individual participants, participant pairings or participants groups, the go-ahead to begin test activities).
- Communicating status reports and updates to the ITWG, RWG and other POC forums.
- Escalating participant issues to their RWG representative, i.e. Participant non-responsiveness in test execution (running behind test schedule, not updating HP SaaS QC or following the defect management process).
- Referring defects that cannot be resolved by the individual participant, or at the ITWG, level to the relevant Procedures working group or the POC-PCF for resolution.

4.1.2 POC Readiness Working Group (POC-RWG)

The POC-ITWG is a sub-group of the POC-RWG, and the POC-RWG will receive regular status reports on the testing progress.

[21] Refer to the POC Market Readiness Strategy for more information on AEMO's POC Implementation Program, see AEMO's website: http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Power-of-Choice/Readiness-Work-Stream

4.1.3 POC Program Consultative Forum (POC-PCF)

The POC-PCF will receive regular status reports on the testing progress. The POC-ITWG will refer any participant issues or defects that cannot be resolved at the POC-PWG or B2B WG RWG level to the POC-PCF.

4.1.4 Procedures Working Groups (POC-PWG and B2B WG)

The ITWG will refer defects to the POC-PWG or B2B WG if industry testing uncovers:

- A showstopper defect in the procedures themselves (e.g. something that cannot technically work as prescribed).
- An area in the procedures which is open to interpretation, and guidance is required from the procedures working group as the correct interpretation. If possible, the ITWG will first agree on a proposed interpretation for the procedures working groups' endorsement.

It is the procedure working groups' responsibility to convene as soon as possible to address the issue and report back to the ITWG chair. If the POC-PWG or B2B WG cannot come to an agreement then the issue will be referred to the POC-PCF.

4.2 Test management tool

HP SaaS QC (QC) will be used to manage the industry testing, including test scenarios, test script development, test lab execution, test results, the tracking of test defects during all cycles and dashboard reporting.

HP SaaS QC 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 using the link:

- https://almgsuqcmt122.saas.hp.com/qcbin/start_a.jsp

4.3 Participant test registration

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

AEMO will prompt for test registration requests and may request participants to complete templates or checklists as part of the registration activities. Registration requirements and templates will be included in the Test Plans.

All registration requests and queries for industry testing should be sent through using the POC inbox: POC@aemo.com.au.

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', then it may need to separately carry out testing for each role (as each role has different 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 once for those IDs.

- Participants will detail which participant roles and ID they will be testing under as part of their Test Registration.

Please note that participants must have an **existing participant ID** for each participant role they wish to test under in industry testing. Intending participants, including organisations undertaking new participant roles, need to follow the process to become registered or accredited in order to be issued a participant ID prior to taking part in industry testing. [22]

4.4 Communication and status reporting

The progress of industry testing will be monitored and reported on as follows:

- On a continuous basis: Test Participants and AEMO via HP SaaS QC.
- On a regular basis: Daily or more frequent, status reports generated by AEMO using HP SaaS QC (frequency and content defined in the Test Plans)
- Milestone reports: Test Completion reports, at the end of each testing phase, prepared by AEMO using HP SaaS QC and input by participants (content defined in the Test Plans).

In addition, testing progress will be reported on in the POC Industry Monthly Readiness Reports and at the POC-related forums.

4.5 Risk and Issues Register

AEMO has established a POC Risk and Issue management process and maintains a POC Risk and Issue Log, which can be found here:

http://www.aemo.com.au/-/media/Files/Electricity/NEM/Power-of-Choice/PM/PoC-Industry-Register.xlsx

All industry testing related risks and issues should be raised using the process detailed in the POC Risk and Issue Management Plan.[23] This Plan also details the process for tracking and addressing risks and issues.

[22] Refer to the POC Industry Accreditation & Registration Plan, see http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Power-of-Choice/Readiness-Work-Stream

[23] See AEMO website, http://www.aemo.com.au/-/media/Files/Electricity/NEM/Power-of-Choice/B2B/PoC-Industry-Management-Plan---Risk-and-Issues.pdf

5. INDUSTRY TEST PREPARATION

Each participant will provide industry test resources to be part of the ITWG for the duration of industry testing preparation 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 process, as per the ITWG Terms of Reference.

5.1 Test Plans

As part of the preparation for industry testing, a series of workshops will be held by the ITWG to develop the Test Plans for the different phases of testing.

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

5.1.1 Test Workbooks

The Test Plans for Phase 1: Industry Test (EN/MC) and Phase 3: Market Trial 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, including identifying:
  - Scenario priority
  - Testing counterparties
- 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 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 NMIs 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 script to allow for multiple executions of that test script in case of defects or problems in execution. Data identified will be mapped against every scenario in the data column in HP SaaS QC.

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

5.2.2 Data refresh

AEMO will undertake a data refresh prior to Phase 1 Industry Testing (EN/MC) and prior to Phase 3: Market Trial. The details of these will be included in the respective Test Plans. Participants are encouraged to align their pre-production data if possible, as this will make aligning data between participants easier.

5.3 Test environment

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

All participant test environments will be maintained and managed by the respective participants.

Figure 3 shows the industry testing environment.

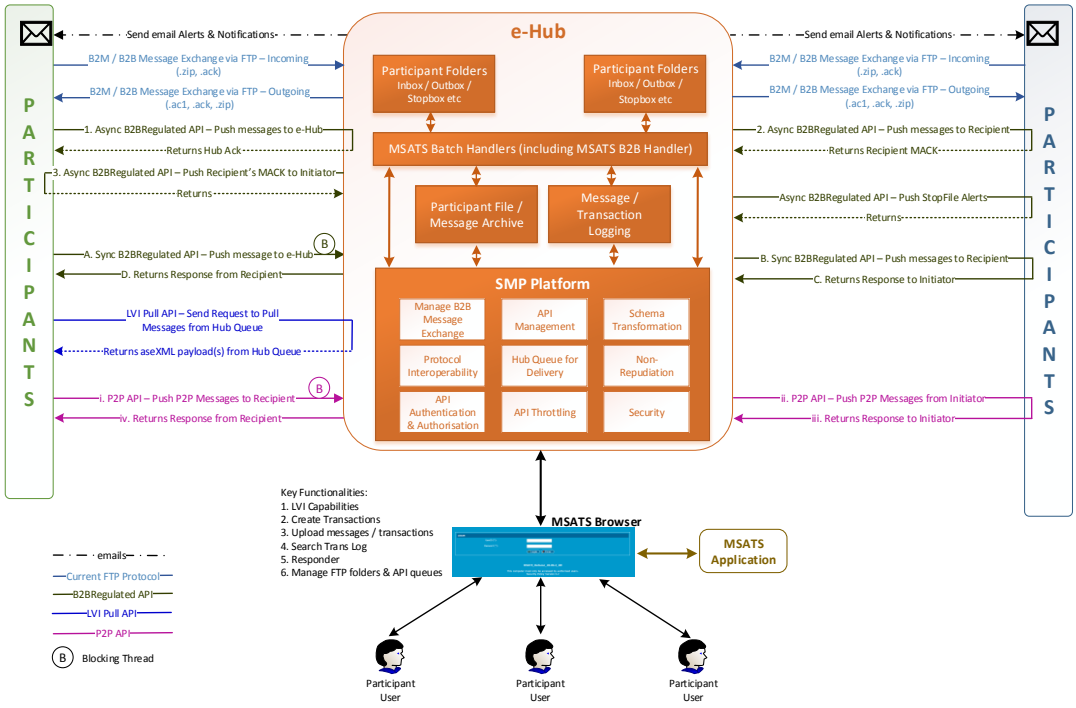

Figure 3 – Industry Testing Environment Diagram

5.3.1 Test support

Test support for the MSATS and e-hub pre-production environments will be provided between 9:00 and 17:00 hrs (AEST) on business days.

6. INDUSTRY TEST EXECUTION APPROACH

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

6.1 Industry Test Entry and Exit Criteria

The entry and exit criteria for each industry test phase will be defined in the relevant Test Plans. Depending on the test phase, the criteria are likely to be based on those listed below.

6.1.1 Entry criteria

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

- Pre-production environment available.
- Participants internal testing completed.
- Pre-production participant ID received for new participants (via registration and accreditation process).[24]
- 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:

- Industry Test Plan is complete, agreed and delivered to the ITWG.
- HP SaaS QC is configured with all required test information, and is accessible and useable by all testing participants.
- Testing participants have confirmed readiness (through the submission of completed entry criteria checklist).

6.1.2 Exit criteria

Exit criteria for the text execution phase include:

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

6.2 Test scenario and script execution

Test execution will be undertaken as follows:

- Respective folders are created in HP SaaS QC Test Plan and Test Lab modules for all participants to facilitate testing.
- Tests scenarios and scripts that are in scope for participants will be set-up in their respective folders of HP SaaS QC Test Plan and Test Lab modules.
- Execution of the testing will be undertaken according to execution calendar made available as part of the preparation activities.

[24] Refer to the POC Industry Accreditation & Registration Plan, see http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Power-of-Choice/Readiness-Work-Stream

- Informal testing may occur between participants, however reporting of the testing will be based on the defined execution calendar.
- Test execution information will be updated in HP SaaS QC 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. Where applicable, this information will be maintained in HP SaaS QC. 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 HP SaaS QC as below:

- Test passed:
  - Test met expected result.
- Test failed:
  - Test did not meet expected result.
- Test blocked:
  - A test cannot be executed due to an outstanding defect preventing the test from been executed.
- Test Not Applicable (N/A):
  - A test that is identified as not a valid test case or not a valid business/end to end scenario to be run

6.2.2 Scenario status

After running each scenario, participants will update the scenario status in HP SaaS QC as below:

- Completed (green)
- In progress (yellow)
- Blocked (red)
- Failed (red)
- Not started

These scenario statuses will be used to generate the status traffic light reports which AEMO will generate and circulate prior to the daily test status meetings.

6.2.3 Test metrics

Test measurement during industry 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 industry 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 HP SaaS QC 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 2 shows the activities which will occur during industry testing and who is responsible for them.

Table 2 – Test management activities

Activities	Description	Timing	Responsibility
Prepare and execute tests	Individual testers are to prepare the testing, which includes the preparation of test scenarios, test scripts, test data and capture actual results for testing.	Daily	Participants
Update progress	Progressively update the status of each script tested in HP SaaS QC.	Daily	Participants
Raising defects	Raising defects from failed scripts or any other root cause in HP SaaS QC.	Real time immediate as soon as the script has failed.	Participants
Managing defects	Review defects logged in the HP SaaS QC.to identify major defects and determine the impact of those defects.	Daily	AEMO and Nominated Participants

Activities	Description	Timing	Responsibility
Retesting defects	Retesting defects once they are available to testers is a priority.	Defect retests are to be completed prior to commencing new scripts.	Participants
Test phase entry	Complete entry criteria checklist	Prior to the commencement of test phase execution	AEMO and Nominated Participants
Test phase exit	Complete exit criteria checks	At the completion of test phase execution	AEMO and Nominated Participants
Test status meetings	Test status meeting to be attended by all testers to discuss progress, issues and defects.	Daily (or as detailed in the Test Plan)	AEMO and Nominated 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 Nominated Participants

7. DEFECT MANAGEMENT

7.1 Defect management approach

The defect management principles and guidelines for industry testing will be a collaborative effort, principally involving the testing teams, development teams and business analysis teams. There will, at times, be a need to consult other project team members for advice and assistance on the resolution of defects. Defect management will be managed entirely within the HP SaaS QC.

The ideal objective of defect management is to resolve all defects within the project lifecycle. This objective is tempered against other project objectives, such as achievement of schedule and 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.

7.1.1 Raising defects

Defects raised during industry testing will be captured in HP SaaS QC, with the following information:

- Description of defect.
- The particular 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 severity and priority.
- Defect status.
- Defect root cause (entered by defect owner).

The term defect is to be viewed generically insofar as that information to be captured within HP SaaS QC may relate to information that would fall outside the normal IT definition of the word defect (against application software or infrastructure). For example:

- Information could be captured regarding lack of required support. This impacts test execution from a timing perspective; and
- Testing may indicate that a particular 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 industry 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.

If required, a separate meeting will be arranged by AEMO and relevant participants to identify the root cause and resolve critical and high priority defects to ensure test execution can progress smoothly.

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

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 SLA, it can be escalated in the daily test status meeting, and if required AEMO will arrange a separate defect triage meeting with the relevant participants to see that the defect is resolved quickly in order to progress in test execution.

7.1.4 Defect prioritisation

Defects will be classified according to severity and priority by the participant test leads in consultation with other impacted participants. Severity will indicate the degree to which the defect affects both the application and more specifically testing. The descriptions of each classification of **severity** are shown in Table 3

Each defect will also be assigned a priority based upon expected impact to the POC Implementation Project. Defect priority will indicate the degree to which the defect affects the progress of testing, and the overall project. Priority is determined using a combination of probability, system impact and the business impact. The descriptions of each classification of **priority** are shown in Table 4.

Table 3 – Defect severity classifications

Severity	Description
1- Showstopper	This is a defect that makes the system unusable resulting in an extremely critical (catastrophic) impact on business operations. The software under test does not perform correctly, there is no work around and displays one or more of the following characteristics: • System hangs or performance is degraded to the point of being unusable. • System crashes repeatedly. • Critical functionality is not available. • An error occurs that results in a catastrophic negative business impact. • An error occurs that results in a loss or corruption of data that affects completion of a business process.
2- Critical	This is a defect that causes major system functionality to be degraded or causes particular features or functions to be inoperative with critical impact to business. The software under test has incorrect behaviours and displays one or more of the following characteristics: • System performance is significantly degraded due to the error. • A total system failure occurs which is caused by an unusual or unlikely sequence of user actions. • Important functionality has incorrect behaviour that significantly disrupts user operation. • An error occurs that results in significant business impact for the participant. • An error occurs that results in a loss or corruption of data that does not affect completion of a business process. • Loss of essential administrative functions. • The specific error cannot be circumvented.

3- Moderate	This is a defect that causes a problem but one that is not critical to overall business operation. The software under test has incorrect behaviour but with limited loss, or no loss of functionality or no impact on participants' operations and displays one or more of the following characteristics: • Minor degradation of business functions. • Loss of routine administration functions. • An error occurs that results in some negative business impact for the participant. • The specific error can be circumvented and the business process can continue with manual or additional systems intervention. • Usability problems in the developed software.
4- Cosmetic	This is a defect that does not affect the functionality of the system. These may be cosmetic errors (e.g. spelling mistake) or they may be errors in the system documentation.

Table 4 – Defect priority classification

Priority	Description
1- High	Defect is considered critical to business operations and/or testing. Core business and project impact. (Severity 1 & 2) Fix/resolution turnaround time best endeavour effort in first 4 hours or provide update on impact
2- Medium	Defect is considered moderate 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 (Severity 3)
3- 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 (Severity 4)

7.1.5 Defect management status

Table 5 shows the valid defect management statuses to be selected in HP SaaS QC.

Table 5 – Defect management status

Status	Description
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 open status.
Open	HP SaaS QC (QC) item that is considered valid to be set to 'Open' for further analysis. Open status means, development team is working on the QC item (analysis or fixing)
Deferred	The defect that potentially has a dependency and will be deferred into future and fixed into the next or future cycle.
Rejected	QC item that is considered invalid is set to 'Rejected'.

Status	Description
	AEMO will set QC item to 'Rejected' with ITWG consultation during daily meetings. If a QC item status is accidentally set to 'Rejected' QC administrator will assist to rectify.
Fixed	Once QC item has been fixed and unit tested by developer the status is set to 'Fixed'. This indicated release manager can release the fix to testing environment.
Test Ready	Once Release manager released the fix to test environment successfully the status is set to 'Test Ready'
Tested	Tester(defect originator) will only test QC item with the status 'Test Ready' and set status to 'Tested' upon passing the QC item.
Closed	Test manager is responsible to set QC item status to 'Closed' once it has been released to production successfully.

7.1.6 Defect process flow

Figure 4 shows the defect management process throughout the various defect management statuses of the defect lifecycle from its inception through to its closure.

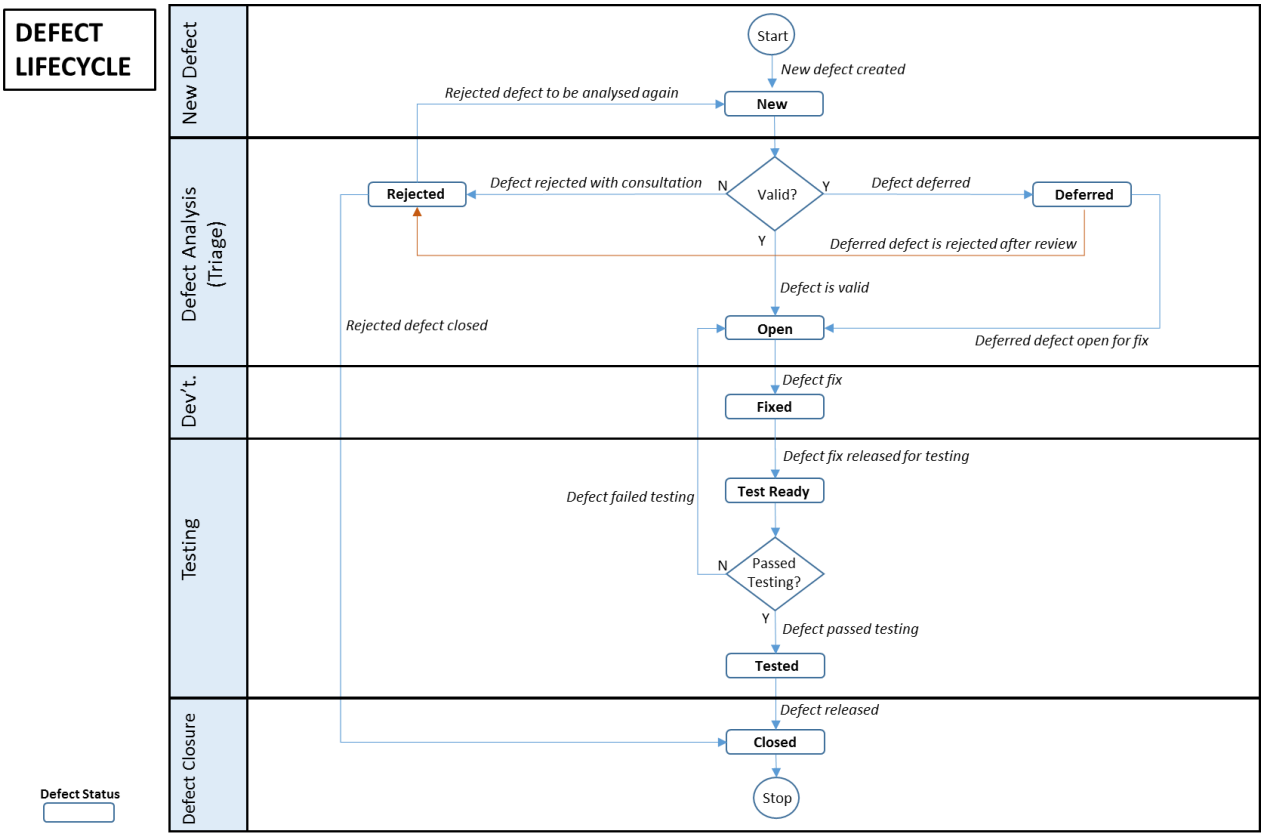

Figure 4– Defect management cycle

7.1.7 Defect cause

Defect root cause will be updated in HP SaaS QC 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 1 shows the available defect causes and their descriptions.

Table 6 – Defect cause

Root Cause	Description
Development/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.
Environment	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.
Performance	Stress, Volume and Load, performance or timing related defect, for example when a system is unable to handle designed / planned volume, required number of concurrent users or network traffic volume.
Test Case/Script	Invalid test case/script where it is determined that the test case is in contradiction with the requirements it aims to test. This should subsequently result in the test case being updated and re-executed.

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 industry testing, and will determine when testing will continue.

7.2.1 Suspension criteria

Complete or partial suspension of testing may be required if:

- High density of defects are open impacted 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 criteria can commence after the issues that caused the suspension of testing have been resolved:

- AEMO will inform the industry participants of the successful deployment of the defect fix(s) and its successful verification.
- AEMO will inform the industry 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 has to be done.