

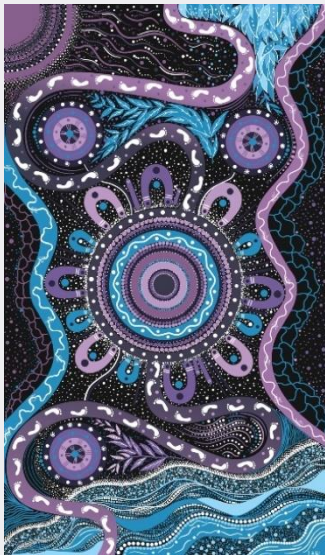
Improving security frameworks for the energy transition

April 2025

High Level Implementation Assessment

Final - how the rule change will be implemented by AEMO





We acknowledge the Traditional Custodians of the land, seas and waters across Australia. We honour the wisdom of Aboriginal and Torres Strait Islander Elders past and present and embrace future generations.

We acknowledge that, wherever we work, we do so on Aboriginal and Torres Strait Islander lands. We pay respect to the world's oldest continuing culture and First Nations peoples' deep and continuing connection to Country; and hope that our work can benefit both people and Country.

'Journey of unity: AEMO's Reconciliation Path' by Lani Balzan

AEMO Group is proud to have launched its first [Reconciliation Action Plan](#) in May 2024. 'Journey of unity: AEMO's Reconciliation Path' was created by Wiradjuri artist Lani Balzan to visually narrate our ongoing journey towards reconciliation - a collaborative endeavour that honours First Nations cultures, fosters mutual understanding, and paves the way for a brighter, more inclusive future.

Important notice

Purpose

AEMO has prepared this document to provide an overview on how the improving security frameworks (ISF) for the energy transition rule change will be implemented. This document aligns with the outcomes of the final ISF Rule, released on 28 March 2024.

Disclaimer

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Version control

| Version | Release date | Changes |
|---------|------------------|-----------------------------|
| 0.1 | 31 May 2024 | Initial version for release |
| 0.2 | 12 December 2024 | Second version for release |
| 0.3 | 17 April 2025 | Final version |

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Contents

| | | |
|-----|--|----|
| 1 | Introduction to the Improving Security Frameworks (ISF) Rule | 6 |
| 1.1 | ISF for the energy transition – the Rule Change | 6 |
| 1.2 | Document background and purpose | 7 |
| 1.3 | Key implementation dates | 7 |
| 1.4 | HLIA stakeholder feedback | 8 |
| 1.5 | Stakeholder engagement | 8 |
| 2 | AEMO summary of key impacts | 9 |
| 2.1 | AEMO’s enablement obligations | 10 |
| 3 | Procedure impacts review | 13 |
| 3.1 | Procedure consultation timeline | 16 |
| 4 | System impacts | 17 |
| 5 | Participant impacts | 20 |
| 6 | Implementation pathway | 21 |
| 6.1 | Implementation timeline | 21 |
| 6.2 | Delivery risks and issues | 22 |
| 7 | Industry readiness approach | 24 |
| 7.1 | Approaches to industry testing | 27 |
| 7.2 | Industry testing environments | 28 |
| A1. | Impact ratings | 28 |

Tables

| | | |
|---------|---|----|
| Table 1 | Tabular view of key impacts | 9 |
| Table 2 | Assessment of the new procedures and documents required to implement the ISF Rule | 13 |
| Table 3 | Final assessment of existing procedures and documents impacted by the ISF Rule | 14 |
| Table 4 | Solution design | 18 |
| Table 5 | Impacts to participants | 20 |
| Table 6 | Initial assessment of delivery risks and issues | 22 |
| Table 7 | Industry readiness approach for ISF December 2025 release | 25 |
| Table 8 | AEMO industry testing approaches | 27 |



Figures

| | | |
|----------|---|----|
| Figure 1 | Summary of impacts for ISF | 9 |
| Figure 2 | Procedure consultation timeline | 16 |
| Figure 3 | High-level solution overview | 18 |
| Figure 4 | Implementation timeline | 22 |
| Figure 5 | Overview of industry readiness approach | 24 |

Definitions

| Definition | Description |
|------------|--|
| AEMC | Australian Energy Market Commission |
| AEMO | Australian Energy Market Operator |
| API | Application Programming Interface |
| HLIA | High Level Implementation Assessment |
| IBR | Inverter-based Resources |
| IRP | Integrated Resource Provider |
| IRS | Integrated Resource System |
| ISF | Improving Security Frameworks |
| NEM | National Energy Market |
| NER | National Electricity Rules |
| NMAS | Non-market Ancillary Services |
| NSCAS | Network Support and Control Ancillary Services |
| OSM | Operational Security Mechanism |
| PDR | Participant Data Replication |
| RERT | Reliability and Emergency Reserve Trader |
| SS | Security Service |
| SSM | Security Service Management |
| TNSP | Transmission Network Service Provider |



1 Introduction to the Improving Security Frameworks (ISF) Rule

1.1 ISF for the energy transition – the Rule Change

On 28 March 2024, the Australian Energy Market Commission (AEMC) made a final determination and preferable final rule to improve market arrangements for system security services. This response comes following rule change requests from Hydro Tasmania and Delta Electricity. The final rule¹ represents a revised approach to the 'Operational Security Mechanism' (OSM) rule change for which a draft determination was released in September 2022.

The final ISF rule builds on existing tools and frameworks within the power system to enhance system security procurement frameworks. It addresses system security challenges during the transition by reducing reliance on directions and providing better incentives for participants to invest in providing system security in the longer term. It also increases transparency on system security needs and understanding, and how AEMO plans to manage system security as the National Electricity Market (NEM) transitions to a secure net zero emissions power system.

The AEMC's revised approach will result in the:

- alignment of the existing inertia and system strength frameworks (introducing a NEM-wide inertia floor, aligning procurement timeframes with the system strength framework, and removing restrictions on the procurement of synthetic inertia);
- removal of the exclusion to procuring inertia network services and system strength in the network support and control ancillary services (NSCAS) framework;
- creation of a new transitional non-market ancillary services (NMAS) framework for AEMO to procure security services necessary for the energy transition;
- requirement for AEMO to enable (or 'schedule') system strength and inertia services (including those procured under the NSCAS framework) across the whole NEM2, and at its discretion enable other NSCAS and transitional services via a new enablement tool; and
- changing of the directions reporting framework.

¹ See <https://www.aemc.gov.au/rule-changes/improving-security-frameworks-energy-transition>.

² Refer Figure 3.8: Interactions between system strength, inertia, and NSCAS frameworks, AEMC Rule determination Improving security frameworks 28 March 2024.

1.2 Document background and purpose

The purpose of this document is to provide information to participants³ on how the ISF rule change will be implemented by AEMO. This is intended to assist and inform participants in the development of their own implementation timelines and impact assessments. This Final High Level Implementation Assessment (HLIA) provides an updated overview of:

- Impacted Market Procedures.
- High level system and data exchange impacts.
- Timelines showing consultation period, industry testing and go-live timings.

This document is indicative only and will not necessarily reflect the project's final design. It is superseded by any information produced later in the project, after project design is finalised, such as Technical Specifications, Data Model reports, and so on. Please refer to the ISF project page⁴ for the latest information.

1.3 Key implementation dates

Table 1 Timetable for key implementation dates

| Stage | Timeline | Status |
|--|-----------------|----------|
| • AEMC Final Rule Determination. | 28 March 2024 | COMPLETE |
| • AEMO to publish High Level Implementation Assessment. | 31 May 2024 | COMPLETE |
| • Transitional services framework to commence (AEMO to procure transitional services subject to the publication of the Transitional Services Guideline – which will be published by 1 December 2024). | 3 June 2024 | COMPLETE |
| • AEMO to publish market notices in real time. • Changes to directions reporting to commence. | 4 July 2024 | COMPLETE |
| • AEMO to publish the Provisional Security Enablement Procedure (https://aemo.com.au/-/media/files/electricity/nem/security_and_reliability/power_system_ops/procedures/so_op_372_0---provisional-security-enablement-procedure.pdf). | 30 June 2024 | COMPLETE |
| • New inertia framework to commence. • AEMO to publish amendments to NSCAS Description and Quantity Procedure (https://www.aemo.com.au/-/media/files/electricity/nem/security_and_reliability/system_security_planning/nscas-description-and-quantity-procedure-v3-0.pdf) and Inertia Requirements Methodology (https://www.aemo.com.au/-/media/files/electricity/nem/security_and_reliability/system_security_planning/inertia-requirements-methodology-v2-0.pdf) and system security reports. • AEMO to publish Transitional Services Guideline (https://aemo.com.au/-/media/files/stakeholder_consultation/consultations/nem-consultations/2024/transitional-services-guideline-consultation/transitional-services-guideline.pdf). • AEMO to publish first Transition Plan for system security (https://aemo.com.au/energy-systems/electricity/national-electricity-market-nem/nem-forecasting-and-planning/transition-planning). • Revisions to Transmission Network Service Provider (TNSP) cost recovery for non-network system security costs will commence. | 1 December 2024 | COMPLETE |

³ The term 'participants' refers to all stakeholders involved in procuring, providing or other activities in the Improving Security Frameworks.

⁴ At <https://aemo.com.au/initiatives/major-programs/nem-reform-program/nem-reform-program-initiatives/improving-security-frameworks-for-the-energy-transition>.

| Stage | Timeline | Status |
|---|-----------------|-------------|
| <ul style="list-style-type: none"> AEMO to publish full SO_OP_3720 Security Enablement Procedure, and other related procedure updates. | 31 August 2025 | In progress |
| <ul style="list-style-type: none"> Enablement obligations on AEMO will commence. | 2 December 2025 | In progress |

1.4 HLIA stakeholder feedback

Any comments or feedback should be sent by email to NEMReform@aemo.com.au.

1.4.1 Stakeholder feedback on previous version of the HLIA

AEMO thanks stakeholders for reviewing v.02 of the ISF HLIA. Feedback was received from one participant and has been taken into account in the development of this version of the HLIA. In the feedback, clarification was sought on the following key aspects of ISF:

- Market trial scope and timing
- Publication of technical documents
- Readiness of Participants and TNSPs
- Transition Plan scope.

1.5 Stakeholder engagement

Collaboration and communication with industry stakeholders on implementation of the ISF Rule will occur via the following channels:

- NEM Reform engagement will occur through the regular monthly forums that AEMO conducts as part of the NEM Reform Program, including:
 - The Program Consultative Forum (PCF, at <https://aemo.com.au/consultations/industry-forums-and-working-groups/list-of-industry-forums-and-working-groups/program-consultative-forum>).
 - The Electricity Wholesale Consultative Forum (EWCF, at <https://aemo.com.au/consultations/industry-forums-and-working-groups/list-of-industry-forums-and-working-groups/electricity-wholesale-consultative-forum>).
 - The Implementation Forum (at <https://aemo.com.au/consultations/industry-forums-and-working-groups/list-of-industry-forums-and-working-groups/implementation-forum>).
- Focused engagement with transmission network service providers (TNSPs) through existing AEMO collaboration, as well as a dedicated Working Group.
- Initiative webpage (at <https://aemo.com.au/initiatives/major-programs/improving-security-frameworks-for-the-energy-transition>).
- Mailbox: NEMReform@aemo.com.au.

2 AEMO summary of key impacts

The diagram below depicts the key impacts to AEMO's systems and processes from the ISF rule change.

Figure 1 Summary of impacts for ISF

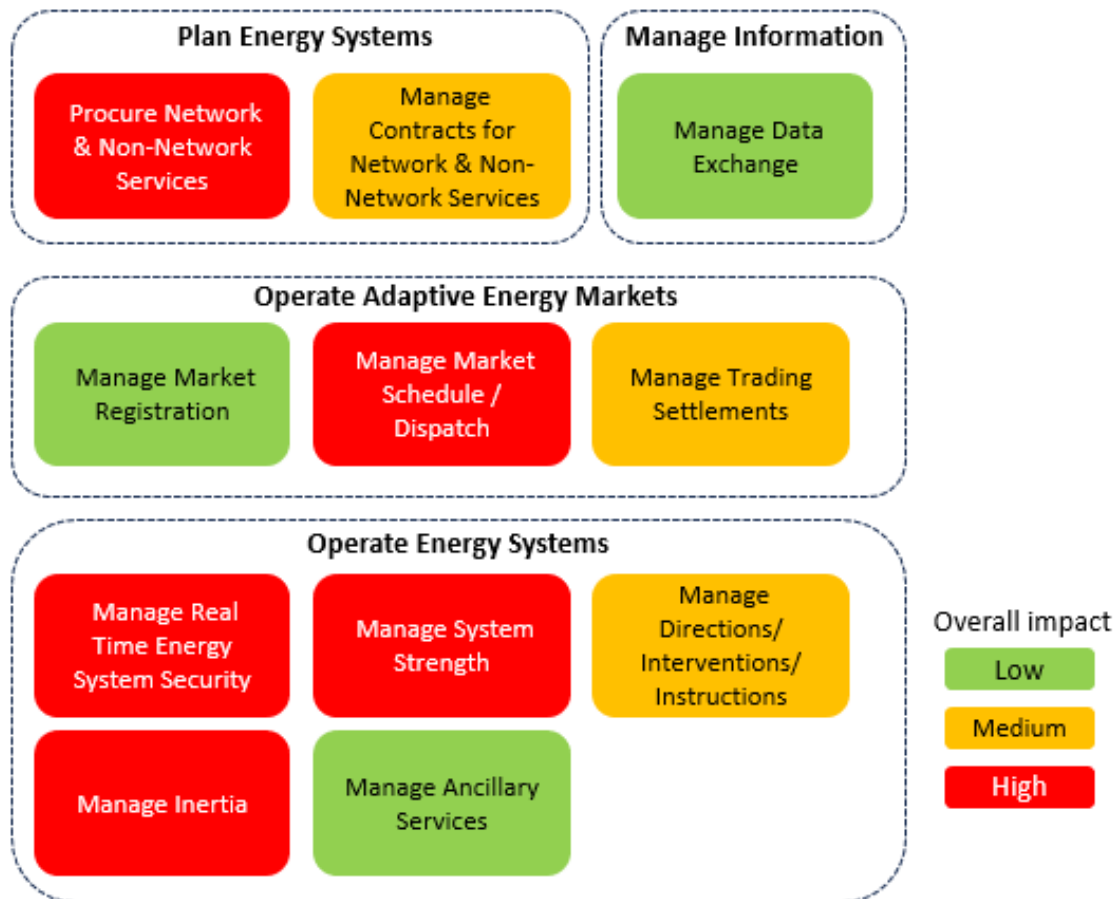


Table 1 Tabular view of key impacts

| Focus area | Impact description | |
|---------------------|---|--|
| Plan energy systems | Procure Network and Non-Network Services | <ul style="list-style-type: none"> New transitional non-market ancillary services (NMAS) framework introduced for AEMO to procure security services as Type 1 or Type 2 Transitional Services. Removes the exclusion to procuring inertia network services and system strength in the NSCAS framework. |
| | Manage Contracts for Network and Non-Network Services | |
| | Publish Documentation and Reports | <ul style="list-style-type: none"> Updates to the existing Inertia Methodology and Report, including the introduction of a new NEM-wide inertia floor. Introduce the Inertia Services Specification (incorporated within the Inertia Methodology and Report). Transitional Services Guideline to be produced. A Statement of Security Need must be published as part of the procurement process. |

| Focus area | Impact description | |
|---------------------------------|--|--|
| | | <ul style="list-style-type: none"> • New annual Transition Plan for System Security report. |
| Operate adaptive energy markets | Manage market schedule / dispatch | <ul style="list-style-type: none"> • Develop procedures for the enablement of system security. • Enable (or 'schedule') security services with a whole-of-NEM perspective. • Daily and annual reporting requirements for operational enablement. |
| | Manage trading settlements | <ul style="list-style-type: none"> • Payments and recovery for NSCAS and Transitional Services. |
| | Manage market registration | <ul style="list-style-type: none"> • Register security service assets as required as system strength production units, inertia production units, transitional services units, or other relevant types. |
| Manage information | Manage data exchange | <ul style="list-style-type: none"> • Issue indicative schedules to providers and TNSPs. • Issue enablement instructions to relevant providers (and TNSPs if procurer of service) to enable security services. • Issue daily reporting on previous day enablement quantities, estimate of costs, and reasons for enablement, per NER 4.4A.75. • Manage dynamic inputs (i.e., availability and other operational information); and other contract information provided by participants. • Issue data to TNSPs to facilitate settlement. |
| Operate energy systems | Manage real-time energy system security | <ul style="list-style-type: none"> • Real-time monitoring and management of schedule of security services. • Manage interaction between directions, scheduled security services and NEMDE dispatch. |
| | Manage system strength | <ul style="list-style-type: none"> • Change in approach to managing system strength and inertia to adopt contracting approach introduced by the ISF rule. |
| | Manage inertia | |
| | Manage ancillary services | |
| | Manage directions / interventions / instructions | <ul style="list-style-type: none"> • Maintain and update reporting on directions. • Reporting on trends in the use of directions. |

2.1 AEMO's enablement obligations

The remaining ISF milestones relate to AEMO's security contract enablement obligations:

- **By 31 August 2025: Publication of the *Full Security Enablement Procedure*.**
- **On 2 December 2025: Commencement of full enablement obligations (operational).**

The published SO_OP_3720 Security Enablement Procedure (Provisional) outlines minimum and recommended contracting requirements. The final, complete SO_OP_3720 Security Enablement Procedure, currently under consultation⁶, outlines AEMO's methodology for service enablement. The system impacts outlined in Section 4 are largely related to operationalising AEMO's full enablement obligations for December 2025.

AEMO's operational enablement will be guided by principles specified in the rules, including that contracts should:

- Be enabled to meet power system security requirements at the lowest cost;
- Be enabled as close to real-time as practicable but not more than 12 hours ahead of time;

⁵ NER 4.4A.7 System security services reporting

⁶ <https://aemo.com.au/consultations/current-and-closed-consultations/security-enablement-procedures>

- Only be enabled to meet operational security gaps; and
- Only be enabled to maintain the stable voltage waveform and host the projected level of IBR in circumstances where enabling those contracts would not result in a significant adverse effect on emissions or efficiency.

Under the new framework⁷, AEMO will be responsible for enabling under its scheduling function:

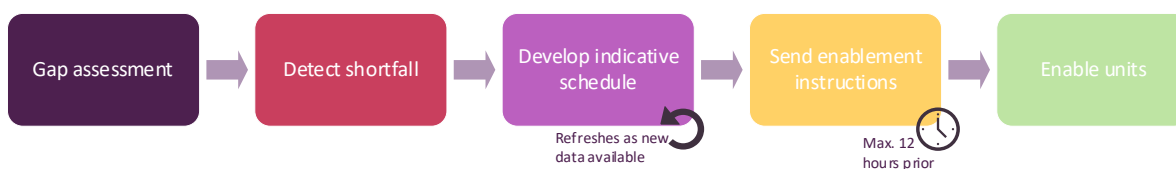
- System Strength contracts, including System Strength contracts procured under the NSCAS framework to meet a NSCAS gap.
- Inertia contracts, including Inertia contracts procured under the NSCAS framework to meet a NSCAS gap.

It is at AEMO's discretion, and will be determined on a contract-by-contract basis, whether to enable via its new enablement tool for:

- NSCAS contracts outside of System Strength and Inertia.
- Transitional Type 1 and Type 2 service contracts.

High-level overview of enablement process

Notwithstanding the full methodology that is to be released in the Security Enablement Procedure, the following outlines AEMO's process for enabling security contracts in real time:



Gap assessment:

- Assessment performed to identify system security gaps and region or location where a service may need to be enabled based on pre-dispatch information.
- The gap assessment will identify any forecast shortfalls in required inertia (MWs) and system strength requirements.

Schedule:

- An indicative schedule is produced based on available security service units to respond to a detected shortfall at least cost and in consideration of system conditions (such as system normal, outages, risk of islanding, minimum system load events).

⁷ AEMC, Table 6.1 Improving security frameworks for the energy transition Final Determination, accessed via <https://www.aemc.gov.au/sites/default/files/2024-03/ERC0290%20-%20ISF%20final%20determination.pdf>

- 
- The schedule will be prepared by AEMO based on the latest gap assessment outcomes and service providers will be issued a notice if they have been scheduled.

Enablement:

- Enablement instructions will be issued to participants as specified in the final SO_OP_3720 Security Enablement Procedure.
- In accordance with NER 4.4A.5(b) and 4.4A.5(c), AEMO may at any time give an enablement instruction to a participant stating that AEMO requires system security services to be enabled or ceased, respectively.
- Enablement instructions will be given by AEMO in accordance with new NER clause 4.4A.5(b).
- Enablement instructions will be issued to participants no more than 12 hours in advance of the enablement period, per NER 4.4A.4(b). However, the enablement end time of the instruction may be more than 12 hours in advance. The Provisional Security Enablement Procedure outlines that if the activation lead time is more than 12 hours, the service will be considered unavailable for scheduling and enablement.
- Enablement instructions may be amended depending on changing conditions, for example, they may be cancelled, or enablement start times and enablement end times may be revised.
- Participants will be required to respond to enablement instructions. Upon receipt of an enablement instruction, market participants are required to update their energy bids/offers in a similar manner to the current process for responding to directions.
- When a participant is enabled to provide system security services, the participant must comply with the enablement instruction in a manner that is consistent with the form of operation required to provide the services in accordance with new NER clause 4.4A.5(e)(f)(g) and the Security Enablement Procedures⁸.

Further information on system impacts is in Section 4.

⁸ SO_OP_3720 Security Enablement Procedure (under consultation) at <https://aemo.com.au/consultations/current-and-closed-consultations/security-enablement-procedures>

3 Procedure impacts review

The ISF rule makes consequential changes to several procedures and documents and introduces new procedures and guidelines. These changes will reflect new business processes, changes to existing business processes, and any minor or administrative changes required to reflect the ISF Rule. Consultation will be required on several of these documents, as indicated in the below tables.

Any changes to the below list of procedure updates and reporting on the progress of consultation processes to update these documents, will be reported via AEMO's Electricity Wholesale Consultative Forum⁹.

Table 2 Assessment of the new procedures and documents required to implement the ISF Rule

| Type of document | Title | Effort required* | Content required | Consultation | Due date |
|------------------|--|------------------|---|----------------------|----------------------|
| Procedure | SO_OP_3720 Security Enablement Procedure (Provisional) | High | Minimum and recommended requirements for contracting. Published by 30 June 2024. | No | 30 Jun 24 (COMPLETE) |
| Procedure | SO_OP_3720 Security Enablement Procedure (Final) | High | Above plus methodology for enablement and forecasting. Published by 31 August 2025. | Commenced 7 April 25 | 31 Aug 25 |
| Guideline | Transitional services guideline | High | Technical requirements for transitional services, and approach to procurement. | Yes | 1 Dec 24 (COMPLETE) |
| Report | Transition plan for system security | High | Understanding of power system security in a low- or zero-emission power system and how AEMO is planning to maintain system security throughout the transition (December 2024 is first publication). | Yes | 1 Dec 24 (COMPLETE) |
| Report | System security services report | Medium | An assessment of the system security services enabled throughout the previous financial year. | Yes | 30 Sep 26 |
| Report | NMAS Cost and Quantities Report (includes the transitional services annual report) | Medium | NER 3.11.12(b) Report on services procured through the transitional services framework. | N/A | Once each October |
| Report | Directions reporting changes | Low | Required to outline why the direction was needed, in addition to existing information already reported. | No | 4 Jul 24 (COMPLETE) |

⁹ See <https://aemo.com.au/consultations/industry-forums-and-working-groups/list-of-industry-forums-and-working-groups/electricity-wholesale-consultative-forum>.

| Type of document | Title | Effort required* | Content required | Consultation | Due date |
|------------------|----------------------------|------------------|--|--------------|--|
| Template | Statement of security need | Medium | Required to procure transitional services – describes how the transitional services satisfy the Transitional Services Objective. | N/A | Ready for publication at the start of each procurement process |

*Please refer to the Appendix for a description of effort ratings.

Table 3 Final assessment of existing procedures and documents impacted by the ISF Rule

| Document | Due date | Impact | Consultation | Consultation commencement |
|--|-----------|---|--|---------------------------|
| Constraint Formulation Guidelines | 31 Aug 25 | Additional section required to describe how security service-specific constraints are formulated, if required by solution design. For example, constraints on security service units to give them targets when contracts are enabled. | Standard Consultation | Commenced 7 April 2025 |
| Constraint Implementation Guidelines | 1 Dec 25 | Any changes to constraint implementation as a result of the ISF rule to be reflected. | Constraint Implementation Guidelines to be updated after Constraint Formulation Guidelines to reflect changes. | Not applicable |
| Schedule of constraint violation penalty factors | 1 Dec 25 | Include new constraint violation penalty factors for constraints implemented in NEMDE as part of security service enablement. It is possible that these constraints in NEMDE will use existing CVPs for security constraints, meaning that potentially no update is required. | Changes to be made available for feedback. | June 2025 (indicative) |
| SO_OP_3704 - Pre-Dispatch | 31 Aug 25 | Pre-dispatch must include the security services scheduled in the latest security service schedule (via constraints and bids). Include this information in the pre-dispatch procedure if required, such as by referencing the Security Enablement Procedure. | Consequential changes proposed as part of Security Enablement Procedure Consultation ¹⁰ . | Commenced 7 April 2025 |
| SO_OP_3715 - Power System Security Guidelines | 31 Aug 25 | Include security service scheduling as one of the options for managing secure power system security. If the ISF Rule requires accreditation or testing of security service assets for participation, add in considerations for this and how it must be done to minimise impacts on power system security. | Consequential changes proposed as part of Security Enablement Procedure Consultation | Commenced 7 April 2025 |
| SO_OP_3718 – Outage Assessment | 31 Aug 25 | Include an explanation that an outage is unlikely to proceed if there are insufficient security services available. | Consequential changes proposed as part of Security Enablement Procedure Consultation. | Commenced 7 April 2025 |

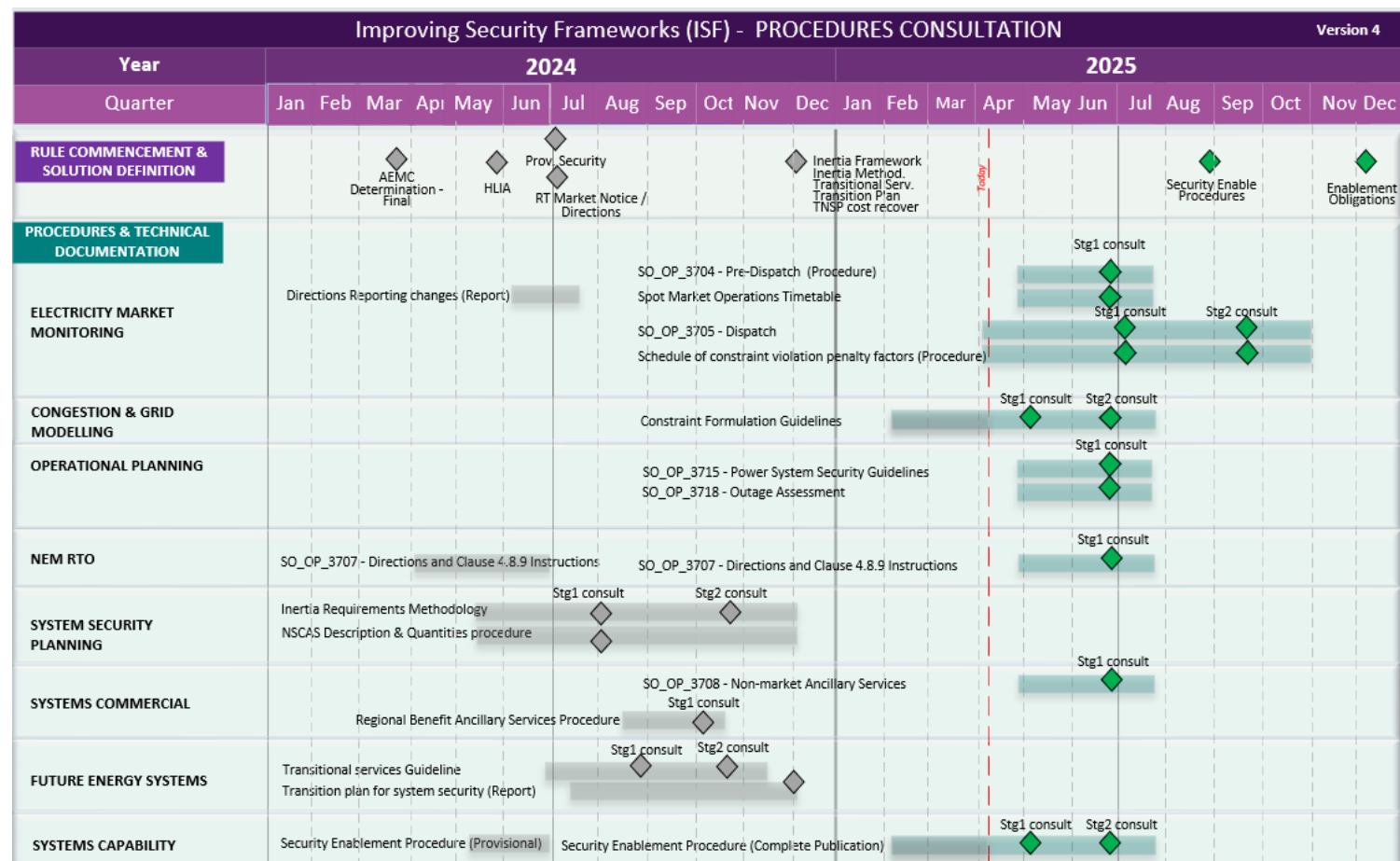
¹⁰ <https://www.aemo.com.au/consultations/current-and-closed-consultations/security-enablement-procedures>

| Document | Due date | Impact | Consultation | Consultation commencement |
|--|------------|---|--|---------------------------|
| Inertia Requirements Methodology | 1 Dec 24 | Add features to the existing methodology document to account for the system-wide minimum level of inertia concept introduced by ISF rule. | Standard Consultation | Completed |
| NSCAS Description & Quantities procedure | 1 Dec 24 | Introduce system strength and inertia gaps as potential NSCAS gaps and define how they will be quantified and declared. | Standard Consultation | Completed |
| SO_OP_3707 - Directions and Clause 4.8.9 Instructions | 4 Jul 24 | Update with market notice information for improving directions transparency. Further update may be required to include that the security service solution forms part of the considerations before issuing a direction and may impact the decision-making process for issuing directions. | Expedited consultation | Completed |
| SO_OP_3707 - Directions and Clause 4.8.9 Instructions | No changes | No further consultation required. | No further consultation required | Not applicable |
| Spot Market Operations Timetable | 31 Aug 25 | To reflect NER 4.4A.7, new information to address AEMO's publication of security service information from the previous day. | Consequential changes proposed as part of Security Enablement Procedure Consultation | Commenced 7 April 2025 |
| SO_OP_3705 - Dispatch | 1 Dec 25 | To include instructions from NER 4.4A.5, either directly or through reference to the Security Enablement Procedure. Other minor changes to wording. | Changes to be made available for feedback. | June 2025 (indicative) |
| SO_OP_3708 - Non-market Ancillary Services | 31 Aug 25 | Dispatch instructions for NEMAS will be reviewed to consider any specifications that are unique for Transitional Services. | Consequential changes proposed as part of Security Enablement Procedure Consultation | Commenced 7 April 2025 |
| Settlements guide to ancillary services payment and recovery | 1 Dec 25 | Include information on how the payments and recovery for Transitional Services are calculated in a new section of the document. | No | Not applicable |
| AEMO statement layout | No changes | Not applicable. | Not applicable | Not applicable |
| Guide to ancillary services in the NEM | 1 Dec 25 | Change the title of section 4 and add information on transitional services to that section. | No | Not applicable |
| NEM Settlement Estimates Policy | No changes | Not applicable. | Not applicable | Not applicable |
| System Strength Requirements Methodology | No changes | Not applicable. | Not applicable | Not applicable |
| Settlement Estimation Guide | No changes | Not applicable | Not applicable | Not applicable |

*Please refer to the Appendix for a description of effort ratings.

3.1 Procedure consultation timeline

Figure 2 Procedure consultation timeline





4 System impacts

This section focuses on the system impacts associated with commencing the scheduling function from 2 December 2025. The ISF Rule provides AEMO with flexibility regarding the enablement approach, in recognition of the need to balance solution complexity and implementation cost alongside the requirement to commence the scheduling function in time.

Owing to the timeframe for implementation of this initiative, AEMO plans to build an initial solution in time for the ISF Rule commencement date. Thereafter AEMO plans to make progressive solution updates that would either systematise any remaining manual components of the scheduling process that deliver efficiency benefits or incorporate new requirements that arise with operational experience.

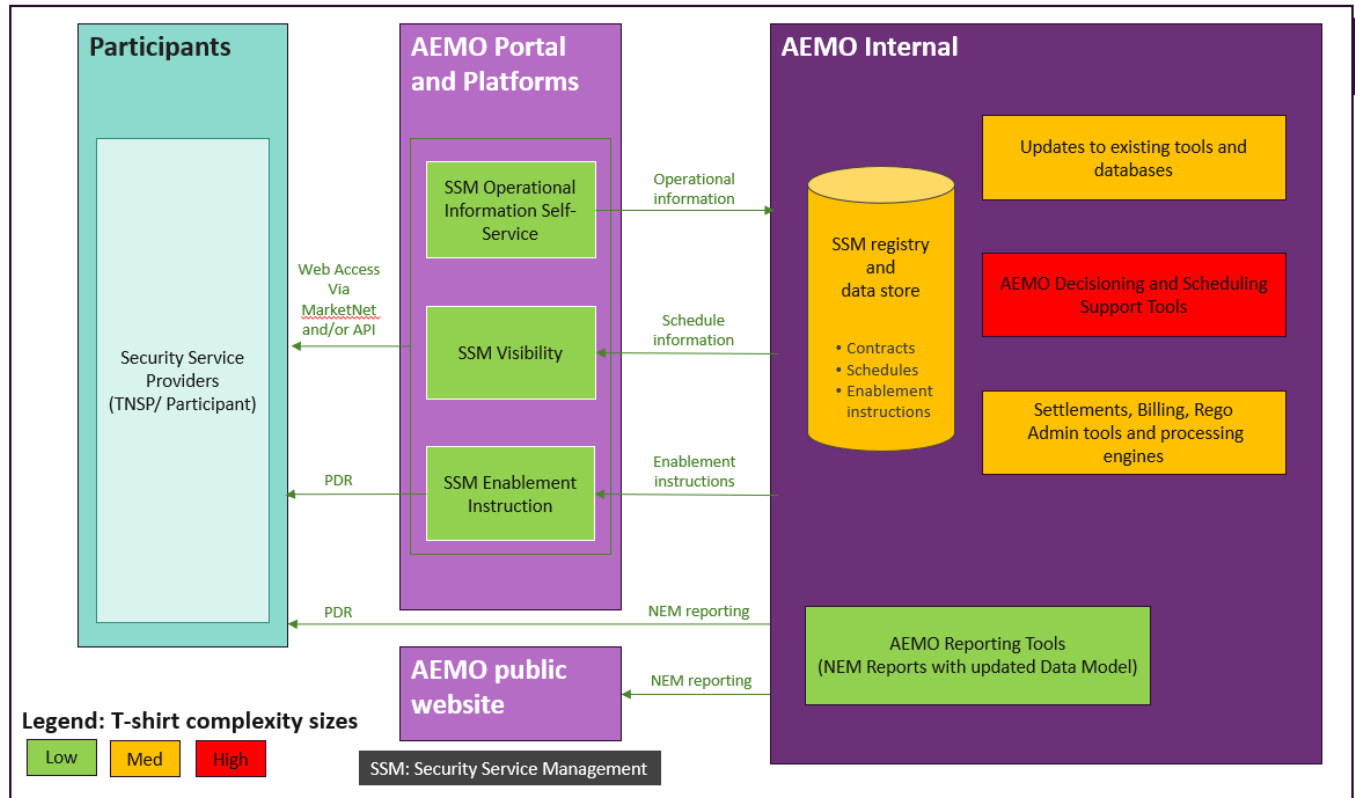
This section provides a high-level indicative overview of the participant interaction and interface impacts to facilitate the initial solution implementation. It is predicated on the critical solution requirements identified to support the security enablement arrangements to be specified in AEMO's Security Enablement Procedure.

The initial solution design will be confirmed to allow sufficient time for AEMO and participants to implement the solution. Key priorities for the initial solution implementation include:

- An auditable, disaster recoverable data store to log security service relevant information such as contracts, availability, schedules and enablement instructions.
- Ability for enablement instructions to be passed on with minimal reliance on manual processes.
- Ability to satisfy the reporting requirements on enablement outcomes as outlined in the ISF rule change.
- Ability for participants to provide up to date operational information to AEMO in a structured format with minimal reliance on manual processes.

If requirements are unable to be met during the available timeframe, then a potentially less systematised and more manual solution may be in place by the rule commencement date.

Figure 3 High-level solution overview



Note: Please refer to Appendix A1 for a description of complexity sizing.

The initial solution design will support the following high-level process:

Table 4 Solution design

| Process | Description | Implementation Approach |
|---------------------|--|---|
| Provision of inputs | <ul style="list-style-type: none"> Providers¹¹ will submit to AEMO up to date availability information (and other operational information if required) that allows AEMO to schedule services effectively¹². | <ul style="list-style-type: none"> AEMO will utilise the existing Markets Portal platform, that will include a new user interface (WEB UI) for availability and operational data inputs. AEMO will expose an API to participants to update to update availability and operational data inputs. AEMO does not plan to make submission available via inbound participant file server for this purpose. |

¹¹ Participants who are a counterparty to a security services agreement.

¹² See AEMO's Security Enablement Procedure (currently under consultation), at <https://aemo.com.au/consultations/current-and-closed-consultations/security-enablement-procedures>.

| Process | Description | Implementation Approach |
|------------------------------------|---|---|
| Security assessment and scheduling | <ul style="list-style-type: none"> AEMO will determine the need to schedule system security services to address operational security gaps. Where AEMO identifies that system security services are required, AEMO will determine the schedule to address the identified gap (subject to the considerations outlined in Section 2.1 of this document). AEMO will use the inputs collected from Step 1 to determine this schedule. | <ul style="list-style-type: none"> AEMO will develop internal decision and scheduling support tools. |
| Enablement | <ul style="list-style-type: none"> AEMO will issue enablement instructions to participants to enable security services. | <ul style="list-style-type: none"> AEMO will utilise the existing Markets Portal platform, that will include a new user interface (WEB UI) to access enablement instructions. AEMO will publish via the existing Data Interchange i.e. participant can consume using the Participant Data Replication (PDR) tool). AEMO will expose an API to participants to poll (Get) to receive enablement instructions. |
| Reporting | <ul style="list-style-type: none"> AEMO will publish enablement reports each day, as required under ISF Rule cl. 4.4A.7(a), that will contain enablement outcomes such as type of security services enabled, relevant facilities, and estimate costs of enablement over the day. | <ul style="list-style-type: none"> AEMO will update Data Model 5.6 AEMO will use the existing Data Interchange (including Participant Data Replication (PDR) tool) for this purpose, enabling participants to see the reports via automated files. AEMO will publish public reports on AEMO's website as per current process. |
| Settlements | <ul style="list-style-type: none"> AEMO will make changes to settlements systems to facilitate the settlement of transitional services under NER cl. 3.15.6A, consistent with the way that NSCAS is currently settled. | <ul style="list-style-type: none"> AEMO will make changes to existing settlements systems. AEMO will update Data Model 5.6. |

5 Participant impacts

This section identifies a list of proposed changes and AEMO’s view of the impact on all participants based on the ISF Rule.

It does not address updates that participants may make within their systems to support business processes given the diverse levels of system maturity and automation across participants, because AEMO cannot predict the exact scale or nature of impacts for each participant. AEMO recommends that each participant perform their own detailed analysis of the rule change, and in this section has highlighted common areas likely to be involved in most participants’ impact analysis to achieve the rule outcomes.

Table 5 Impacts to participants

| Impacted participant | Proposed impact |
|--|---|
| Generators (Scheduled and Semi-Scheduled); Integrated Resource Providers; and/or Other security service providers | <ul style="list-style-type: none">Participants contracted with TNSPs and/or AEMO to provide security services will be required to comply with AEMO’s Security Enablement Procedure¹³.These Participants will make system updates that support provision of up-to-date availability information (and other operational information if required) to allow AEMO to schedule services effectively, and to receive and respond to enablement instructions.Potential system impacts associated with settlement of NSCAS and Transitional Services. |
| Transmission Network Service Providers | <ul style="list-style-type: none">Align business processes with that set out in AEMO’s Security Enablement Procedure.Potential system impacts, if required, to ensure contract information provided to AEMO for the purposes of scheduling for security, and to receive schedule information for the purpose of security contract settlement. |
| Cost Recovery Market Participants | <ul style="list-style-type: none">Cost Recovery Market Participants (CRMPs) will be impacted by the introduction of Transitional Services, which are to be recovered under the same methodology as NSCAS, per NER 3.15.6A¹⁴. |

For more information on the readiness activities, see Section 7. Stakeholders are encouraged to engage in AEMO’s readiness activities throughout 2025.

¹³ See AEMO’s Security Enablement Procedure (currently under consultation), at <https://aemo.com.au/consultations/current-and-closed-consultations/security-enablement-procedures>

¹⁴ AEMO Regional Benefits Ancillary Services Procedure: https://aemo.com.au/-/media/files/stakeholder_consultation/consultations/nem-consultations/2024/isf-rule-changes-for-regional-benefits-ancillary-services-procedure/regional-benefit-ancillary-services-procedures_final.pdf

6 Implementation pathway

6.1 Implementation timeline

The timeline shown in Figure 4 below considers the scale of change for AEMO and participants based on the impact assessment of the final rule change determination. To provide sufficient time for AEMO and industry to implement an initial system solution in time for rule commencement, a baseline of requirements has been defined and a system solution for December 2025 will be built on the basis of those requirements.

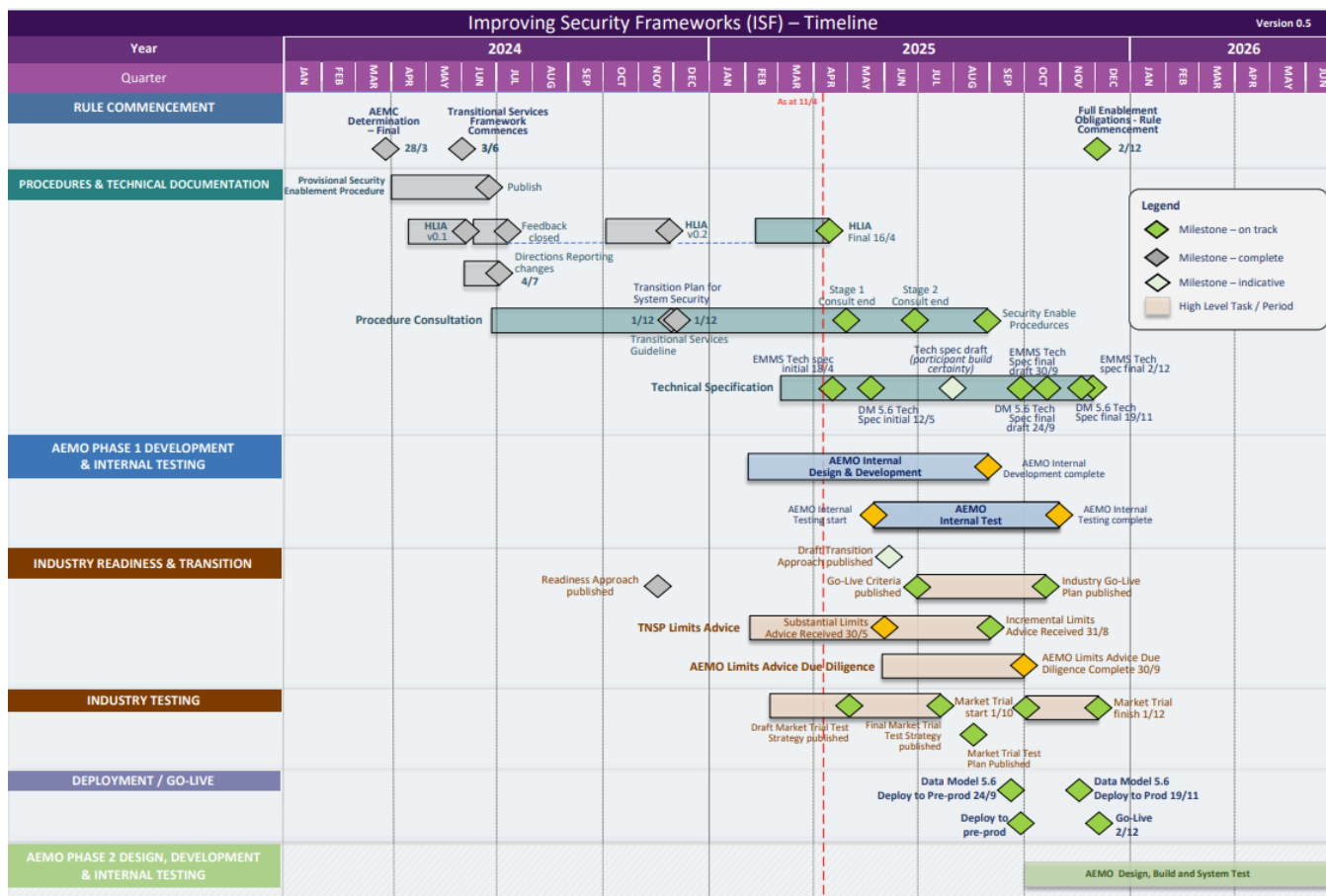
After 2 December 2025, AEMO plans to make progressive solution updates as part of a Phase 2 that would either systematise any remaining manual components of the scheduling process that deliver efficiency benefits, or incorporate new requirements that arise with operational experience. AEMO is endeavouring to minimise any participant-side changes during this phase. Whilst AEMO aims to automate as much of the solution as possible for implementation by 2 December 2025, the scope and associated implementation timeline of these progressive Phase 2 updates have a dependency on the consultation and completion of procedures and documents due 31 August 2025.

In consideration of participant readiness, AEMO has designed changes that re-use existing platforms, technology and patterns, to minimise impacts where possible and thus time required of participants to implement system changes.

The solution delivered in line with rule commencement 2 December 2025 will impact Data Model 5.6, particularly with the introduction of new tables and reports. Initial technical specifications are scheduled for release commencing mid-April 2025, with the initial EMMS technical specification expected to be published by 18 April and the initial EMMS Data Model 5.6 technical specification expected by 12 May. As per current process, technical specifications will be iterated monthly with additional updates where required, through to production.

AEMO acknowledges the risk of compressed delivery timeframes and anticipates significant parallel development and test activity. AEMO will prioritise the development of participant impacted systems in order to successfully conduct AEMO coordinated market trials, expected to commence early October.

Figure 4 Implementation timeline



6.2 Delivery risks and issues

AEMO has identified the following risks for the delivery of the ISF rule change. AEMO will identify, monitor and manage risks as the project progresses, and proposes to report these via the Implementation Forum.

Table 6 Initial assessment of delivery risks and issues

| Identified risk | Inherent rating (current rating) | Mitigation strategies | Residual rating (after mitigation) |
|-----------------------|----------------------------------|--|------------------------------------|
| Participant readiness | High | <ul style="list-style-type: none"> Participants knowledge that they are a counterparty to an agreement, and therefore must make system/process changes, will be subject to TNPS (or AEMO) procurement timelines. AEMO to ensure TNPSs are making counterparties aware of the need to adopt AEMO's system and process impacts. Make information on participant impacts available with opportunities for engagement with AEMO, including: <ul style="list-style-type: none"> Release updates of HLIA with further information regarding system impacts as available. | Medium |

| Identified risk | Inherent rating (current rating) | Mitigation strategies | Residual rating (after mitigation) |
|---|----------------------------------|--|------------------------------------|
| | | <ul style="list-style-type: none"> – Engage with participants via AEMO forums. – Consult with participants via AEMO's Implementation Forum on proposed testing approach and release of technical documentation. • Participant readiness to be incorporated within AEMO's Transition Approach and Contingency Approach. | |
| Contention and priority of Improving Security Frameworks amongst other reform initiatives – impacting common capability areas. | High | <ul style="list-style-type: none"> • NEM Reform program governance to manage priority and contention. • Phased delivery of capability to support market transition. | Medium |
| Compressed timeframes to meet required rule commencement dates | High | <ul style="list-style-type: none"> • Progress phased delivery of system implementation. • Plan for possible update to solution requirements in late 2025 pending completion of Security Enablement Procedure – reflected in Proposed Timeline in Section 6.1. | Medium |
| Scope of initial system implementation meets delivery timeframes, but results in too much internal resource effort to fulfill AEMO scheduling obligations. | High | <ul style="list-style-type: none"> • Prioritise scope inclusions in initial system implementation that deliver most value and reduce manual resource effort, within the time constraints of the ISF Rule. • Consider the most appropriate solution delivery strategy that will support responsiveness to need for solution updates post December 2025. | Medium |
| Implementation complexity arising due to policy uncertainty, which is driven by the principles-based nature of the framework improvements under the ISF Rule. | High | <ul style="list-style-type: none"> • Engagement with industry through procedure consultation. • Iterative approach to system and process development. | Medium |
| TNSP Readiness | High | <ul style="list-style-type: none"> • Make information on TNSP impacts available with opportunities for engagement with AEMO, including: <ul style="list-style-type: none"> – Release updates of HLIA with further information regarding system impacts as available. – Engage regularly with TNSPs, including via a dedicated Working Group. • Participant readiness to be incorporated within AEMO's Transition Approach and Contingency Approach. | Medium |

7 Industry readiness approach

The following sections confirm the final readiness approach for the delivery of ISF Phase 1 ('baseline' requirements) on 2nd December 2025, noting that a readiness approach for Phase 2, to be delivered in 2026, will be prepared separately when further requirements and delivery milestones have been confirmed.

In consideration of the uncertainties regarding AEMO system impacts and participant capability, AEMO will engage with Participants to develop an overall transition approach (5 June 2025), on how AEMO will establish scheduled services for existing contracts and those that will be in place by 2 December 2025. A Transition Plan will also be made available setting out expected responsibilities, activities, dependencies and timeframes for transitioning affected participants to the new security services enablement solution.

Figure 5 Overview of industry readiness approach

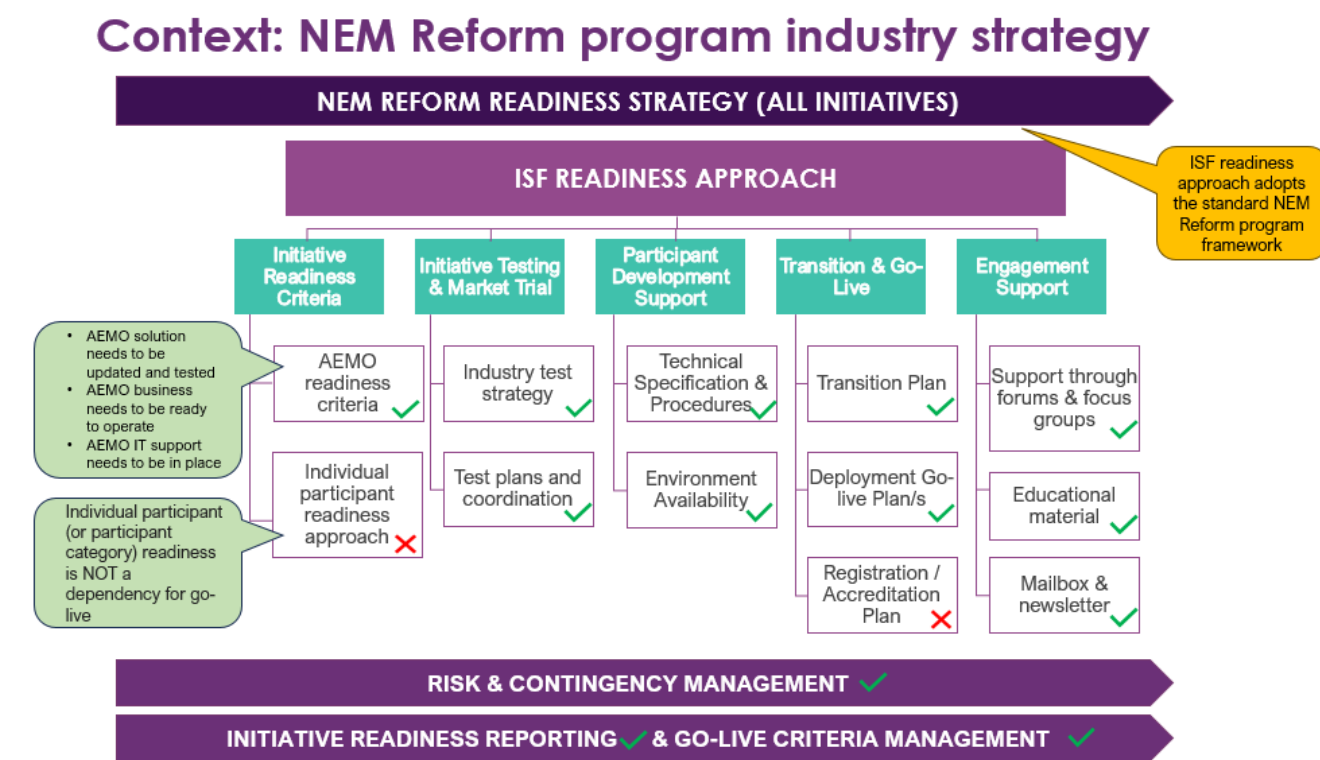


Table 7 Industry readiness approach for ISF December 2025 release

| Readiness area | | Initial view of industry readiness |
|---|---|--|
| Phase 1 - Initiative readiness criteria | Individual participant readiness approach | <ul style="list-style-type: none"> Participant readiness is NOT a dependency for go-live on 2 December 2025 when scheduling of security services contracts come into effect. AEMO will not commence enablement of a security service until participants enablement capability has been demonstrated, during or post Market Trial period and approved by AEMO. This is to ensure AEMO can schedule services effectively. TNSPs must provide AEMO with sufficient information on system security agreements, and corresponding operational or limits advice on their contribution to system security requirements, to facilitate scheduling. |
| | AEMO readiness criteria | <p>By the ISF rule commencement date (2 December 2025) AEMO's:</p> <ul style="list-style-type: none"> Solution needs to be developed and tested for: <ul style="list-style-type: none"> Markets Portal updates: <ul style="list-style-type: none"> to access Contract information and enablement instructions, to submit/maintain security service availability (and other operational information). Wholesale data interchange and participant data model support of enablement instructions, schedules and reporting. Effective enablement of contracts to maintain power system security and correct operation in conjunction with other existing market systems and processes. Effective alarming and enablement of real time response to contingency events impacting system strength and inertia services. Settlements/Billing changes for NSCAS and Transitional security services procured by AEMO. Business needs to be ready to operate. IT support needs to be in place. |
| Market Trial | Market Trial test strategy | <ul style="list-style-type: none"> Detailed approach covering overall scope and scale, along with timings will be confirmed with the issue of a draft Market Trial Test Strategy on 2 May 2025 and final on 18 July 2025. For further information, Section 0 provides a general overview of AEMO's approaches to Industry Testing. A market trial is considered appropriate to coordinate activities such as scheduling security services and settlements runs for impacted participants to confirm their enablement capacity by testing those AEMO market systems they will need to interact with, to participate in the enablement process. The process for management of any defects identified during Market Trial will be articulated in the Market Trial Test Strategy, with the draft expected to be published in early May. |
| | Test plans and coordination | <ul style="list-style-type: none"> Test plan for coordinated activities will be developed in collaboration with participants reflecting the scope of the trial established in the Market Trial Test Strategy. Industry Test Working Group (ITWG) Q&A sessions available for updates on testing progress and for additional support. Sign up at NEMReform@aemo.com.au. |
| Participant development support | Procedures | <ul style="list-style-type: none"> ISF rule specifies that new procedures and guidelines will need to be developed, consulted on and published by the timeframes set in the final rule. Consultation on Full Security Enablement Procedures have commenced with finals to be published by 31 August 2025. Consultation on the enablement methodology will be included in this process. Refer section 3.1 Procedures consultation timeline. Progress of consultation processes to update the documents will be reported via AEMO's Electricity Wholesale Consultative Forum. |
| | Technical specifications | <ul style="list-style-type: none"> EMMS Technical Specification availability: |

| Readiness area | | Initial view of industry readiness |
|------------------------|-------------------------------------|--|
| | | <ul style="list-style-type: none"> – Initial draft - available 18 April 2025 with monthly updates – ‘Ready for Participant Build’ version – available 31 July 2025 – Final draft - available 1 October 2025, in line with Preproduction deployment – Final version - 2 December 2025, in line with Production deployment. • Initial EMMS Data Model 5.6 technical specification will be available 12 May 2025 and include changes related to Registrations and Settlements systems. Monthly updates will be released as required through to go-live. EMMS DM 5.6 deployment: <ul style="list-style-type: none"> – Preproduction: 24 September 2025 – Production: 19 November 2025 • Market Systems User Group (MSUG) sessions available for additional support. Sign up details at https://www.aemo.com.au/energy-systems/market-it-systems/it-change-and-release-management. |
| | Environment availability | <ul style="list-style-type: none"> • Preproduction will be available to support the market trial to test changes. • No additional development support environment has been identified. |
| | IT development support | <ul style="list-style-type: none"> • AEMO will run ITWG Q&A sessions during the Industry Test period to support participants commencing 30 September 2025. • As required, AEMO will provide industry support via NEM Reform forums, information sessions, focus groups and daily stand-ups for affected participants. These engagements would be scheduled as the IT design and approach is formalised to support participants development. |
| Transition and go-live | Transition plan | <ul style="list-style-type: none"> • AEMO will engage with participants to develop the Transition Approach on how AEMO will transition to new scheduling arrangements for existing contracts as well as those contracts expected to be in place by 2 December 2025, along with agreed timeframes. • Draft Transition Approach is due for publication 5 June 2025. |
| | Go-live plan | <ul style="list-style-type: none"> • An Industry Go-live plan will be developed, in consultation with industry, to confirm detailed deployment and capability availability timeframes in the lead up to rule commencements including: <ul style="list-style-type: none"> – When data model will be populated with new/changed data and reports available. – Commencement of scheduling enablement – Process and timings for loading existing and new security service agreement detail into the security service enablement mechanism. • Final plan to be published October 2025. |
| | Registration or accreditation plans | <ul style="list-style-type: none"> • No new registration or accreditation requirements. |
| Engagement support | Forums and Focus groups | <ul style="list-style-type: none"> • The NEM Reform Program will support affected market participants in each reform phase from implementation design, procedures development, solution delivery and through to industry testing. • Support will be provided as required via NEM Reform forums, information sessions, ISF TNSP Working Group, 1:1s and daily stand-ups. |
| | Educational material | <ul style="list-style-type: none"> • AEMO will make available educational material to support awareness, assessment and preparation for affected participants. Made available through the project’s dedicated webpage, this may include, but is not limited to, guides and factsheets, FAQs and industry presentations. |
| | Mailbox and newsletter | <ul style="list-style-type: none"> • Participants support provided via monitored mailbox • Regular communications around project milestones |

| Readiness area | | Initial view of industry readiness |
|--------------------------------|--|---|
| Initiative readiness reporting | Risk & contingency management | <ul style="list-style-type: none"> Contingency plans will be in place and shared with participants in the lead up to go-live, as part of readiness activities. This will include processes outside of automated digital solutions to cater to scenarios where manual intervention is required, including the use of Directions. Contingency approaches will be developed and agreed with industry. |
| | Initiative readiness reporting & go-live criteria management | <ul style="list-style-type: none"> Formalised participant readiness reporting required Participants to confirm access and ability to receive enablement instructions. AEMO will report to industry, summary of Industry activities and progress against confirmed L1/L2 industry readiness milestones on a regular basis through NEM Reform forums. AEMO will schedule formal checkpoints against go-live criteria for each initiative, 3 and 1 month prior to go-live, to provide assurance of implementation preparations, allowing time for finalising AEMO's and participants business preparations. |

7.1 Approaches to industry testing

This section outlines AEMO's general approach towards industry testing.

AEMO plans to provide an opportunity for industry participants to test their updated systems and processes prior to release of AEMO updates into production.

The approach to the level of co-ordination, integrated planning and scenario management that will be provided is dependent on a number of factors including:

- Impact to end-to-end participant process flows;
- Ability of impacted participants to successfully test changes without AEMO or other participant co-ordinated activity;
- Number and range of participants impacted by release.

The approaches to industry testing are outlined in the following table.

Table 8 AEMO industry testing approaches

| Type of industry test | Description | Example |
|-----------------------------|--|--|
| Industry testing | 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 or bid submission |
| Invitation industry testing | Coordinated testing of business process scenarios with a select number or subset of participants with systems ready for testing. | Testing NMI transfer Process |
| Market trials | Coordinated multi-party end-to-end testing of business process scenarios. | Meter exchange involving CRs, service orders and 5-minute meter reads |

In all cases, involvement in testing is voluntary on participants' behalf. Agreement on approach to the type of industry testing for a release is conducted through the Implementation Forum and Industry Test Working Group (ITWG) along with support arrangements during the test period.

7.2 Industry testing environments

AEMO provides a pre-production (**preprod**) environment for industry tests, market trials and general participant testing. Key features of the preprod environment are:

- All AEMO Market Systems can be tested in preprod. This includes test versions of AEMO's Retail and Wholesale IT Systems.
- Participants can interact with preprod via a test version of the Markets Portal and via AEMO's various interfaces¹⁵.
- The Market Systems applications in preprod are generally maintained to a high level. Generally, preprod is used as the final step for system changes for both BAU and projects prior to promotion to Production. Preprod is regarded as a production-like system, and any issues with preprod can be reported to the AEMO Support Hub.
- Data in preprod is a complete copy of the production Market Systems and is normally refreshed annually and is driven by project requirements¹⁶.
- Access to production and pre-prod is managed via the Participant Administrator (PA) role¹⁷.

A1. Impact ratings

| Impact rating | Description |
|---------------|---|
| No impact | No change's to AEMO or industry systems, processes, guidelines, or procedures. Stakeholder consultation not required. |
| Immaterial | Immaterial administrative changes to AEMO procedures and/or guidelines, purposes of consistency. Immaterial changes or additions to existing business processes and/or technology systems. Stakeholder consultation not required. |
| Low | Minor changes, additions, or updates to AEMO procedures and/or guidelines, purposes of consistency. Minor changes, additions, or updates to existing business processes and/or technology systems. |
| Medium | Material changes or additions to AEMO procedures and/or guidelines. Significant changes or additions to existing business processes and/or technology systems. Stakeholder consultation required. |
| High | Significant changes, additions, or creation of new AEMO procedures, and/or guidelines. Significant changes, additions, or the creation of new business processes and/or technology systems. Stakeholder consultation required. |

¹⁵ For information on connecting to AEMO's production and preproduction systems, see <https://visualisations.aemo.com.au/aemo/web-help/Content/ConnectingToAEMO/Interfaces.htm?tocpath=Connecting%20to%20Market%20Systems%7C0>.

¹⁶ For information on preprod data, see https://visualisations.aemo.com.au/aemo/web-techspecportal/Content/TSP_TechnicalSpecificationPortal/Pre-productionRefresh.htm.

¹⁷ For more information on system access, see <https://visualisations.aemo.com.au/aemo/web-help/Content/Common/UserRightsAccessMarketsPortal.htm?tocpath=About%20the%20Markets%20Portal%7C6>.