



Department of Energy, Mines,
Industry Regulation and Safety
Energy Policy WA

Coordinator of Energy Determination: Western Power Non-co-optimised Essential System Service Trigger Submission

Reliability and System Strength Services for the
Eastern Goldfields Region

15 March 2024

Working together for a **brighter** energy future.

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1. This Determination

The Coordinator of Energy (Coordinator) has determined, under clause 3.11A.4 of the Wholesale Electricity Market (WEM) Rules, to trigger a Non-Co-optimised Essential System Services (NCESS) procurement process by Western Power for up to 150 megawatts (MW) of Reliability Services and up to 1,500MVA of System Strength Services for the Eastern Goldfields region to commence from 1 July 2026.

In accordance with clause 3.11A.8 of the WEM Rules, the Coordinator is publishing this determination to outline the reasons for triggering the NCESS procurement process on this occasion.

2. Background to the Determination

2.1 The NCESS Framework

The primary objective of the NCESS framework is to enable the Australian Energy Market Operator (AEMO), a Network Operator or the Coordinator to identify and justify the need for services, not already available through existing market mechanisms, and procure those services in a transparent and efficient manner.

More specifically, the NCESS framework is intended to:

- enable the procurement of new services to respond to unforeseen events or changes in the power system that may threaten system security;
- create appropriate incentives for non-network services to be procured to meet power system security and reliability requirements in a more economically efficient manner when compared to network augmentation; and
- enable maintenance of power system security and reliability at the lowest efficient cost to consumers; and
- ensure the rapidly evolving power system continues to meet emerging technical requirements and power system security and reliability standards.

Under the NCESS framework, AEMO and the Network Operator may identify the need for NCESS through system planning processes, and if certain conditions are met, must submit a request to the Coordinator to trigger the NCESS procurement process under the WEM Rules.

The WEM Rules outline the process by which each of the entities must seek to trigger the NCESS procurement process and the factors the Coordinator must consider in assessing a submission by AEMO or a Network Operator.

3. The Western Power Submission

3.1 Submission Process

The Coordinator received a submission from Western Power on 12 March 2024, requesting that the Coordinator triggers the NCESS procurement process for Reliability and System Strength Services.

Under clause 3.11A.2 of the WEM Rules, AEMO or a Network Operator must make a submission to the Coordinator to determine whether to trigger an NCESS procurement process if they reasonably consider that one or more of the following events has occurred or applies:

- if the forecasted or actual magnitude and frequency of Energy Uplift Payments in the WEM increases to an uneconomic level (assuming locational and situational market power is being controlled under the relevant processes), indicating a locational constraint in the network;

- If frequent AEMO Intervention Events to relieve non-frequency control constraints such as loss of reactive power or system strength indicate a network security problem;
- if network planning assumptions change at any time during the network planning timeframe (for example, demand is lower or higher than forecast), signalling the need for an emerging service such as reactive power support or voltage stability which could be provided by non-network services located in the relevant part of the network;
- if a modification to an existing Power System Security or Power System Reliability standard or the introduction of a new Power System Security or Power System Reliability standard within a network planning cycle trigger the needs for an NCESS; or
- if AEMO considers, in the course of its normal power system operations, that a significant threat to Power System Security or Power System Reliability exists or is emerging, and the existing mechanisms under these WEM Rules may not be sufficient to address the threat.

A NCESS submission must contain sufficient information and analysis regarding the potential or actual impact on Power System Security, Power System Reliability or costs for each trigger event to enable the Coordinator to make a determination (clause 3.11A.3(c)).

The next section provides a summary of the issues raised in Western Power's NCESS submission. Western Power's submission is available on Energy Policy WA's [website](#).

3.2 Western Power's Submission in brief

One of Western Power's primary functions prescribed through temporary obligations under the *Network Quality and Reliability of Supply (NQRS) Code 2005* (NQRS Code) is to maintain minimum reliability and security standards for supply to the Eastern Goldfields (EGF) region.

Following a recent outage event impacting Kalgoorlie, the Minister for Energy (Minister) and Energy Policy WA (EPWA) are considering the implementation of improvements to the reliability of electricity supply in the EGF Region through amendments to the minimum reliability standards in the NQRS Code.

In the light of the proposed amendments to the reliability requirements in the NQRS Code, Western Power has identified several factors that indicate a need for an alternative option to investment in the network in the EGF region, including:

- an increasing amount of unserved energy during prolonged supply disruptions; and
- the retirement of large, synchronous generators and anticipated uptake of inverter-based resources across the network.

Western Power has identified that, in the absence of a suitable solution, the existing arrangements in the EGF region will not adequately support reliability and system strength in the EGF during an islanding event. Specifically, expected power supply reliability and security capability will be insufficient to meet the potential improvements to the reliability requirements in the NQRS Code or service anticipated increases in demand.

To ensure compliance with the proposed amendments to the reliability requirements in the NQRS Code for the EGF region, Western Power has determined that the most efficient alternative option to major augmentation or new network facilities investment, will require the provision of non-network services located in the EGF region through the NCESS framework.

Accordingly, there is a need for the development of innovative non-network solutions (by service providers) that maintain reliable supply to the EGF region and meet customer expectations for increased renewable energy in the grid. Additionally, Western Power is seeking services to ensure system strength requirements are met, including for islanded and black-start situations.

The trigger submission summarises Western Power's assessment of the most efficient means of meeting its obligations under the proposed amendments to the reliability requirements in the NQRS Code and proposes procurement of services under the NCESS framework.

Western Power consulted EPWA and AEMO, as required by section 3.2 of the NCESS Guideline (published in accordance with clause 3.11A.2A of the WEM Rules) and met the requirements of clause 3.11A.2(f) of the WEM Rules. Outcomes from this engagement were included in Western Power's submission.

3.2.1 Services sought

Western Power is seeking to procure Reliability and System Strength Services. Specifically:

- A Reliability Service with the capability to minimise power supply disruption as a result of planned or unplanned outages (with ability to maintain a stable islanded network following the loss of the 220 kilovolt (kV) line and provide black-start capability in the event of total power loss to the region); and
- a System Strength Service with the capability to maintain voltage stability, power quality obligations and sufficiently high fault levels for intact network conditions, or as a result of planned or unplanned outages (with ability to maintain a stable islanded network following the loss of the 220kV line). Western Power also requires services to ensure system inertia requirements are met for islanded and black-start situations.

Western Power expects the services will sufficiently address the proposed amendments to the reliability requirements in the NQRS Code, as an alternative option to major augmentation or new network facilities investment in the short to medium term.

Western Power seeks to procure up to a maximum of 150MW of Reliability Service and a System Strength Service up to a maximum of 1,500MVA of available fault level. Western Power noted that these quantities may require adjustment to reflect the final form of the potential improvements to the minimum reliability standards in the EGF region.

The contract term for the proposed NCESS services would commence on 1 July 2026 with a five-year duration and a possibility of a five-year extension. Western Power noted that the timing of the commencement of the proposed services is under consideration and will be refined through the NCESS process including through input from potential NCESS providers.

Western Power expects to gain industry feedback under the NCESS Expressions of Interest process to understand any economic or technical benefits associated with a different contract duration or a change to the commencement date.

A prospective NCESS provider may offer either a Reliability Service or a System Strength Service, or both, that can fully or partially meet the relevant service requirements. Western Power aims to secure services from multiple NCESS providers to manage redundancy and encourage a diversity of supply in the EGF.

For new facilities, Western Power will facilitate future connections in accordance with its Connections Policy within preferred locations in the EGF. These preferred locations would be outlined in the draft NCESS Service Specification, should the Coordinator determine to trigger this NCESS procurement process.

Potential proponents interested in discussing access to land in the EGF region are encouraged to contact Development WA at contact@developmentwa.com.au.

When the services are not called by AEMO in accordance with Western Power's NCESS Contract, NCESS providers may still offer their capabilities into the WEM by participating in the WEM trading mechanisms for energy, Essential System Services and Reserve Capacity. NCESS providers capable of receiving Capacity Credits will be required to apply for certification for each relevant Capacity Year during the contract term in accordance with clause 5.2A.2 of the WEM Rules.

Western Power will structure the NCESS Contracts in a manner that ensures availability and delivery of the service without exceeding the value of the service to consumers by, for example, accounting for any relevant market revenues received outside of the NCESS Contract.

Following Coordinator approval, Western Power will release the draft NCESS Service Specification, alongside a request for Expressions of Interest which would outline the full requirements for these services.

4. Coordinator's Assessment

In accordance with clause 3.11A.7 of the WEM Rules, the Coordinator is required to take a number of factors into account when assessing Western Power's submission and determining whether to trigger the NCESS procurement process. This section provides a summary of the Coordinator's assessment of these factors, which has relied heavily on the analysis provided in Western Power's submission.

4.1 Where the issues relate to Power System Security or Power System Reliability, the extent to which an NCESS will address these issues (clause 3.11A.7(a))

The Coordinator has determined that, following the recent outage event impacting Kalgoorlie, the Reliability and System Strength Services procured via the NCESS process have the potential to address the emerging reliability issues in the EGF region.

The Coordinator considers that, without procuring the Reliability and System Strength Services via the NCESS procurement process, there is a material risk that Western Power will be unable to meet its obligations under the proposed amendments to the reliability requirements in the NQRS Code and ensure system security in the EGF region following a Contingency Event.

4.1.1 The issue the NCESS is aiming to address

Western Power has assessed the Reliability and Security Service requirements of the EGF region and has identified a need for additional non-network services to meet the proposed amendments to the minimum reliability and system strength standards.

Reliability Service Requirements

Following a recent outage event impacting Kalgoorlie, the Minister and EPWA are considering the need for improvements to the reliability of the network in the EGF Region.

Network infrastructure in the EGF region currently consists of a single 650 kilometres 220kV line from the Muja terminal to the West Kalgoorlie Terminal.

The length of the overhead line and its exposure to environmental factors make it susceptible to unplanned outages. In the event of a 220kV line outage, the EGF region would experience a major power supply disruption (or blackout). While most unplanned outages are of short duration, there have been occasions where the outage period can last for an extended period due to major equipment or line structure damage.

Existing measures to mitigate Contingency Events in the EGF region are managed by a third-party service, comprising of two Synergy gas turbines connected to the West Kalgoorlie Terminal substation (covering 99 per cent of township loads) and AEMO, who dispatches additional generation capacity as required during an islanding event. This arrangement has historically been sufficient in recovering all existing reference service customer load in the EGF region (~100 - 110MW).

However, if the Minister makes improvements to the minimum reliability standard in the EGF region following the recent outage event, this arrangement will not meet the reliability standard nor be sustainable in the future. As a result, if prolonged supply disruptions were to occur there will be an increasing amount of unserved energy.

The Coordinator, therefore, agrees that the proposed amendments to the minimum reliability standard require an alternative option in order to maintain the reliability in the EGF region.

System Strength Service Requirements

Historically, System Strength requirements have been met through large, synchronous generators that assist to maintain voltage stability/system frequency, providing sufficiently high fault levels for protection systems to operate as intended, and avoiding unstable operation of inverter-based resources/generator control systems and power quality issues.

Western Power has identified that the transition to inverter-based resources, along with the retirement of large, synchronous generators on the network, may require a non-network service to meet the System Strength requirements in the EGF region.

Western Power's recent analysis of the network identified that an increase of circa 1,500MVA of available fault level (System Strength) will be required to support system security and stability.

4.1.2 Extent to which NCESS will address this issue

Without procuring the Reliability and System Strength Services, Western Power's analysis indicated that existing arrangements in the EGF region will not be sufficient to address the proposed amendments to the reliability requirements or sufficiently service increases in demand. As a result, Western Power proposes to undertake NCESS procurement to support reliability and system strength in the EGF region, including during an islanding event.

Reliability Service Requirements

Western Power's current obligations under the NQRS Code involve restoring and maintaining at least 45MW of supply to essential service loads and the majority of small use customers following either a planned or an unplanned outage of a transmission element supplying the EGF.

Based on current best estimates, Western Power determined that a up to a maximum of 150MW of the Reliability Service is required to support reliability and system strength and sufficiently meet the demand of all existing reference service customers in the EGF region. Western Power notes that this may need to be adjusted to reflect the final form of the potential improvements to the minimum reliability standards in the EGF region.

The Coordinator agrees that the development of innovative non-network solutions (by service providers) that maintain reliable supply to the EGF region are required to meet customer expectations.

System Strength Service Requirements

Western Power's analysis of the network indicated that an increase of circa 1,500MVA of available fault level (System Strength) will be required to support system security and stability in the EGF region.

The Coordinator agrees that additional services are required to meet customer expectations for increased renewable energy in the grid and to ensure that system strength requirements are met for islanded and black-start situations.

More generally, the Coordinator considers it is important that the Service Specification that is released under clause 3.11B.1 of the WEM Rules does not impose unnecessary or premature requirements on potential proponents.

4.2 The extent to which an NCESS will minimise costs in the WEM (clause 3.11A.7(b))

The Coordination considers that procuring the Reliability and System Strength Services via the NCESS framework is a cost-efficient alternative option to major augmentation or new network facilities investment in the short to medium term.

The Coordinator considers that Western Power must apply appropriate mitigation measures to minimise the cost of this procurement. In particular, consideration must be given to the requirements in the Service Specification to ensure that a range of technologies can compete for the Reliability and System Strength Services.

Contracts should be structured in a manner that ensures availability and delivery of the service without exceeding the value of the service to consumers, including by accounting for any relevant market revenues received outside of the NCESS Contract.

At the request of Western Power, the Coordinator has redacted commercially sensitive information from the analysis in accordance with 3.11A.8.

4.3 The relative merits between procuring an NCESS or augmenting the network (clause 3.11A.7(c))

Western Power determined that building transmission infrastructure connecting the EGF to the South West requires significant lead times, of up to 10 years for planning and construction. Western Power has estimated that the cost to construct a new 330kV rated double circuit transmission line from Muja Terminal to West Kalgoorlie Terminal would be significant, based on the scope and best estimates at the time of submission.

Based on its assessment, Western Power considered that a non-network solution in the EGF region may be the most suitable and cost effective option to address the proposed amendments to the minimum reliability requirements in the short to medium term, specifically that:

- a non-network solution would establish an alternative supply source for the EGF region during periods in which the upstream network supply is restricted or unavailable.
- a non-network solution is also likely to be more readily available for implementation when compared to the lead times it would take to plan and construct a new transmission line.

The Coordinator accepts that market based services is the most suitable option to enhance reliability and security of supply in the EGF region.

4.4 Whether it is suspected that there is a potential exercise of market power (clause 3.11A.7(d))

The Coordinator is not aware of any market power aspects relating to the identified trigger.

4.5 Whether the procurement of an NCESS is consistent with the Wholesale Market Objectives (clause 3.11A.7(e))

The Coordinator considers that the proposed procurement of NCESS Reliability and System Strength Services is consistent with the Wholesale Market Objectives.

The current Wholesale Market Objectives, under section 122 of the *Electricity Industry Act 2004* and clause 1.2.1 of the WEM Rules, include to:

- promote the economically efficient, safe and reliable production and supply of electricity (clause 1.2.1(a));

The Coordinator considers that:

- a robust competitive procurement process for the Reliability and System Strength Services via the NCESS will ensure the cost of the services is as efficient as possible; and
- the issues the Reliability and System Strength Services are aimed at addressing relate to Power System Security and Power System Reliability, and the procurement of these services via the NCESS has the potential to adequately address them.

- to encourage competition among generators and retailers in the South West Interconnected System (SWIS), including by facilitating efficient entry of new competitors (clause 1.2.1(b));

The Coordinator considers that the two-stage NCESS procurement process in the WEM Rules has been developed to encourage effective competition and, therefore, the proposed use of this process meets the objective in clause 1.2.1(b).

- to avoid discrimination in that market against particular energy options and technologies, including sustainable energy options and technologies such as those that make use of renewable resources or that reduce overall greenhouse gas emissions (clause 1.2.1(c));

In accordance with clause 3.11B.1, Western Power must prepare a draft NCESS service specification, which amongst other things must include the “maximum” quantity of the service required.

The Coordinator considers that, to meet the Wholesale Market Objective in clause 1.2.1(c), a service specification can (and should) be developed by Western Power such that the service can be delivered by a range of technologies.

In accordance with clause 3.11B.3A, Western Power must develop and publish, an Expressions of Interest form, setting out the details prospective service providers must provide, which must include whether the facility or equipment that may be able to provide the service can “fully or partially” meet the draft NCESS Service Specification. This would allow a range of technologies to compete for the Reliability and System Strength Services.

- minimise the long-term cost of electricity supply to customers in the SWIS and encourage measures to manage the amount of electricity used (clause 1.2.1(d) and (e)).

The Coordinator considers that the proposed NCESS procurement has the potential to minimise the long-term cost of electricity supply to customers in the SWIS, as follows:

- In accordance with clause 3.11B.10, Western Power must select one or more NCESS offers, which meet the NCESS Service Specification and will result in the highest value for money;
- In accordance with clause 3.11B.11, Western Power must, when assessing highest value for money conduct cost-benefit analysis or other assessments to demonstrate how a NCESS offer will maximise value for money; and
- In accordance with clause 3.11B.12, Western Power may decide to not select any NCESS offers if it considers that none of the NCESS Submissions represent value for money.

4.6 Whether procurement of an NCESS will be in the long-term interests of consumers (clause 3.11A.7(f))

The Coordinator considers that the mitigation of the risks identified in Western Power’s submission are in the long-term interest of consumers within the EGF region, as the service will ensure reliable and secure supply as required by the proposed enhancement to the reliability standard prescribed in the NQRS Code.

As noted in section 4.2, Western Power must continue to consider mitigation measures to minimise the cost of the proposed NCESS procurement to the WEM. It must also ensure that the NCESS procurement process and the Service Specification include measures to deliver the lowest cost to consumers, as discussed in section 4.5.

5. Determination Summary

On the basis of the Coordinator's assessment in this determination, the Coordinator considers that an NCESS procurement for the Reliability and System Strength Services by Western Power is the most suitable option to address the proposed amendments to the reliability requirements in the NQRS Code and ensure reliable and secure supply to the EGF region during a Contingency Event.

Western Power's submission included both technical and financial analysis to demonstrate that the existing market mechanisms in the EGF region are unlikely to meet enhanced reliability requirements under the NQRS Code.

The Coordinator is satisfied that the trigger conditions in section 3.11A of the WEM Rules have been met, and that a NCESS procurement process should be conducted in accordance with section 3.11B of the WEM Rules.

The Coordinator expects Western Power will take into account the matters regarding the NCESS procurement process addressed by the Coordinator in section 4 of this determination.

6. Next Steps - NCESS Procurement Process

Based on the information in Western Power's submission, the Coordinator has determined that Western Power is the procuring party for this NCESS and will be responsible for paying for the Reliability and System Strength Services once the commercial terms are determined.

On this basis, Western Power must prepare a draft NCESS Service Specification for the Reliability and System Strength Services in accordance with clause 3.11B.5 of the WEM Rules. Western Power must consult with the Coordinator and AEMO in the preparation of this draft specification.

Within 20 Business Days of the publication of this determination, unless otherwise agreed with the Coordinator, Western Power must advertise a call for Expressions of Interest on Western Power's website and on at least one major tender portal.

Respondents must be given at least 20 Business Days to respond to the Expressions of Interest call, from the time it is published.

This first step of the process will enable Western Power to determine what suitable service providers exist and what solutions they can provide to meet fully or partially the requirements. Suitability may depend on several factors such as the type of technology, operational limitations, etc. If suitable providers are not found, the service specification may need to be modified.

If the NCESS procurement is to proceed based on the Expressions of Interest received, Western Power will issue a request for tender and publish a final service specification to commence the procurement process.

Any existing or new facility or equipment whether belonging to registered or intending market participants is able to participate in an NCESS procurement. New providers that did not participate in the Expressions of Interest step can also apply.

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