

# Review of Independent System Operator Role in North West Interconnected System

**November 2018**

Final Report for the Public Utilities Office

# Important notice

## PURPOSE

AEMO has prepared this document to provide information about the proposed role of an Independent System Operator for the North West Interconnected System, using information available at 24 November 2018.

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## VERSION CONTROL

Version	Release date	Changes
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# Executive summary

In August 2017, the Minister for Energy (the Minister) announced the Western Australian Government's intention to implement a 'light-handed' regulatory regime to facilitate fair and reasonable third party access to the North West Interconnected System (NWIS).

The NWIS reform is aimed at making the power system more efficient, removing barriers of entry for new projects and retailers, improving the security and reliability of power supply in the region, and facilitating better coordination between market participants.

## **NWIS reform components**

The NWIS reform process consists of two key components:

1. Develop a network connection and access regime to facilitate fair and reasonable third party access to the NWIS.
2. Establish a NWIS Independent System Operator (ISO) to enhance whole-of-network security, manage ancillary services and perform network planning.

The absence of a formal operational framework for the NWIS, the limited coordination between market participants with respect to power system operation, and the existence of multiple network operators are all factors that have created operational issues for market participants and resulted in limited third party access to the network.

The Department of Treasury – Public Utilities Office (PUO) engaged the Australian Energy Market Operator (AEMO) to review the proposed ISO elements outlined in the PUO's *Regulatory framework for the Pilbara electricity networks: Design Report*, dated 29 March 2018 (Design Report), and provide recommendations to improve the NWIS operations.

## **NWIS ISO functions**

AEMO has identified the following minimum core functions for the ISO to perform its role effectively:

- Maintain and manage the whole-of-system model.
- Administer the NWIS Rules.
- Determine the types and quantities of ancillary services needed in the NWIS and procure those ancillary services.
- Administer energy balancing ancillary services.
- Perform operational planning and outage coordination.
- Develop and apply an operational framework for NWIS ISO actions in emergencies and contingencies.
- Perform post-incident reviews and analysis.
- Undertake whole-of-system long-term planning (Integrated System Plan).
- Assess NWIS participant registration applications and maintain participant register.
- Recover NWIS ISO function costs.

- Undertake compliance monitoring and reporting.
- Facilitate dispute resolution processes under the NWIS Rules.
- Perform ancillary service settlement.

### **NWIS ISO model options**

Recognising that more extensive NWIS ISO functions and powers may achieve greater benefits, albeit with greater implementation and ongoing operational costs, AEMO examined three NWIS ISO model options and considered their applicability in the NWIS:

- Administrative ISO model: Undertake the core functions, with a proceduralised operational framework for NWIS ISO actions in emergencies and contingencies.
- Operating ISO model: Undertake the core functions, with the addition of 24/7 visibility and coordination.
- Full ISO model: Similar to the Wholesale Electricity Market and the National Electricity Market models (i.e. dual power system and market operation functions).

### **Key finding**

The Administrative ISO model is the optimal ISO model for the NWIS in its current operating environment. It meets the core objectives for NWIS reform in a 'least cost' and 'least intervention' manner, improves transparency in the operation of the NWIS, confers obligations and functions on the parties that are best-placed to manage them, and was widely accepted by participants during the stakeholder engagement process.

Importantly, this model provides the essential platform for the strategic and structured future evolution of the NWIS and would support economic development in the Pilbara region and prosperity for Western Australia as a whole.

### **AEMO's approach to NWIS ISO review**

The key finding is the result of extensive review activities undertaken by AEMO:

- Review and analyse the 35 design elements in the Design Report, including a minimum effective design for the NWIS ISO role.
- Identify organisational risks (to the ISO) in addressing the design elements and how they could be mitigated.
- Identify and resolve participant concerns that may inhibit the NWIS ISO establishment, implementation and operation.
- Identify and define the core NWIS ISO functions and powers required to meet the design objectives.
- Identify practical options for NWIS reform implementation.
- Determine indicative costs for the NWIS ISO establishment, implementation and for the first 3 years of operation.

These review activities have been supported by a comprehensive stakeholder engagement strategy and associated activities involving all key stakeholders from industry, government and across AEMO. Ongoing stakeholder engagement during subsequent phases of the NWIS reform process would be beneficial.

### **Recommendation**

AEMO recommends the Administrative ISO model as the optimal option for the NWIS in its current operating environment.

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# 1. North West Interconnected System

The NWIS is an interconnected power system supporting the iron ore, gas, minerals, tourism industry and residential communities in the Pilbara region of Western Australia. Residential and small business users represent about 25 per cent of NWIS connected loads, with mining and industrial loads making up the majority of electricity demand.

The NWIS provides power for mining operations, port facilities and operations, light industrial, commercial and residential loads from Shay Gap in the east to Dampier in the west and inland to Paraburdoo and Hope Downs 4.

The NWIS supplies the communities of Paraburdoo, Tom Price, Pannawonica, Dampier, Karratha, Roebourne, Wickham, Point Sampson, Port Hedland and South Hedland.

Given the Pilbara region's importance to the Western Australian economy, the NWIS provides vital energy infrastructure for continuing development and future prosperity for all Western Australians.

## 1.1 NWIS structure

### 1.1.1 Infrastructure

Key NWIS infrastructure consists of:

- 8 power stations
- 30 bulk supply substations
- Substantial transmission infrastructure
- Extensive distribution network operating at a range of voltages.

### 1.1.2 Companies

Four network owners and four power station owners currently operate in the NWIS:

- Alinta Energy (network and power stations):
  - Network infrastructure: East Pilbara.
  - Power stations: Port Hedland, Boodarie.
- ATCO Power Australia (power station only):

- Power station: Karratha.
- BHP (network only):
  - Network infrastructure: East Pilbara.
- Horizon Power (network and power station):
  - Network infrastructure: East Pilbara, West Pilbara (including 220kV line between Cape Lambert and Port Hedland).
  - Karratha Temporary Power Station (operated by ATCO).
- Rio Tinto (network and power stations):
  - Network infrastructure: West Pilbara (coastal), West Pilbara (interior), South Pilbara (interior).
  - Power stations: Yurralyi Maya, Cape Lambert, Paraburdoo, West Angelas.

### 1.1.3 Operational overview

The NWIS operates with:

- Approximately 21,000 distribution customers.
- Peak load of approximately 480 MW.
- Installed capacity of approximately 800 MW.

The NWIS transmission infrastructure is somewhat interconnected, with interconnections that are electrically relatively weak, with a range of different voltages, multiple points of transformation and constrained capacity at many points in the system. The interconnections within or between networks were intended to increase individual operator efficiency and, in some cases, to mitigate risk between operators.

Figure 1 below provides an overview of the infrastructure in the NWIS.

**Figure 1 NWIS infrastructure**



Source: Compiled from publicly available information by Department of Treasury, Public Utilities Office. Note: BHP and Alinta lines from Newman are not connected to the NWIS.

Compared to the South West region, electricity infrastructure in the broader Pilbara region has largely evolved in an ad-hoc manner, with multiple owners and operators of generation assets, and loosely-connected electricity networks. Parties have invested in generation capacity to meet their own current and

future needs, allowing for operational requirements including scheduled maintenance and unplanned outages of generation and network infrastructure.

The generation and network infrastructure that is owned and operated by the mining companies (or which has been installed primarily to meet mining company requirements under contract) is strongly integrated into their respective mining operations. The cost of establishing and maintaining generation and network infrastructure may represent a small proportion of total operation costs, but issues with electricity supply can significantly affect mining operation productivity and profitability.

Because the NWIS is not centrally planned or operated, it has developed in an uncoordinated manner over several decades. Resources and energy companies made individual investments in generation capacity and network infrastructure for their own requirements, and the Western Australian Government met the needs of other users in the major towns of Port Hedland and Karratha through Horizon Power.

As a result, there have been limited opportunities to avoid inefficient resource duplication through shared use of common electricity infrastructure, and the cost of electricity supply has increased. There is a risk that the future economic development of the Pilbara region will be affected. The electricity networks in the Pilbara region have particularly suffered from not having a formal framework to allow a secure and efficient electricity system to evolve. The Pilbara region is a significant driver of Western Australia's economic and export performance, but the critical electricity infrastructure underpinning it has become increasingly fragmented and costly, and there is a lack of genuine market competition due to significant network access barriers for third parties.

## 1.2 Operational issues

The absence of a formal operational framework for the NWIS, the limited coordination between market participants with respect to power system operation, and the existence of multiple network operators are all factors that have created operational issues for market participants and resulted in limited third party access to the network:

- Lack of standardisation, consistency and transparency in managing common or shared issues:
  - Bilateral contracts govern relationships between connected parties, the NWIS is dependent upon informal agreements and arrangements between parties to manage issues affecting multiple parties.
  - No obligation for participant cooperation/collaboration to achieve adequate technical outcomes.
- Model exclusivity:
  - No 'whole-of-system' model, with network operators (or their consultants) holding their own models.
  - No transparent sharing of information regarding management of network issues.
  - Lack of visibility regarding operational impacts on other participants' systems, and any visibility mechanism would be unable to protect commercial confidentiality.
  - Adverse impacts from sub-optimal technical outcomes that cannot be quantified.
- Inefficient system-wide ancillary services:
  - Ancillary services undertaken by individual operators to meet their needs.
  - Lack of centralised coordination, resulting in excessive or inadequate ancillary service resourcing.
- Excess generation capacity impacts:
  - Generation capacity procured for individual participant needs, including contingency.
  - Large amounts of excess generation capacity = technical challenges, economic inefficiencies and maintenance costs.
- No central outage coordination:
  - Potential power system security risks.

- No uniform rules for the NWIS:
  - Potential technical conflicts between participants.
  - Barriers to entry for new participants.
  - Upward pressure on energy prices.
  - Potential TEC subsidy increases for South West Interconnected System (SWIS) and major users.

# 2. Proposed Reform

As part of its commitment to energy reform, the Western Australian Government intends to implement a 'light handed' regulatory regime for network connection and access in the Pilbara region in order to improve the efficiency, security and reliability of the power system.

## 2.1 Reform overview

The NWIS reform process consists of two components:

- Develop a network connection and access regime to facilitate fair and reasonable third party access to the NWIS.
- Establish a NWIS ISO to enhance whole-of-network security, manage ancillary services and perform network planning.

The NWIS reform process aims to achieve the following benefits:

- Improve security and reliability of power supply through better coordination between network participants.
- Provide opportunities for industry and energy producers to avoid inefficient resource duplication through shared use of common electricity infrastructure. Promote regional economic growth and development, and job creation by:
  - Lowering operating costs for local business and lowering the cost of electricity as an investment hurdle for expanding mining and other industry operations in the Pilbara region.
  - Creating new opportunities and jobs in the energy sector, including investment in renewable generation.
- Deliver a process that is not overly burdensome and does not introduce unnecessary costs:
  - As the NWIS is smaller than the SWIS in terms of size/relative market development, the regulatory and operational frameworks must be fit-for-purpose and must also cater for future NWIS growth and development.
- Remove barriers to network access in the NWIS and create an environment that allows multiple parties to provide electricity services. This will facilitate future growth in the Pilbara region and assist with development opportunities in preparation for the next round of economic expansion.<sup>1</sup>

Establishing a regulatory framework for the NWIS, with an appropriately-sized NWIS ISO, is expected to enhance the integration of network and generation investment and power system operation. This in turn would lead to an increased availability of secure and lower-cost electricity services. The electricity system would become more competitive and would provide the necessary platform for future economic growth in the Pilbara region.

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<sup>1</sup> Department of Treasury – Public Utilities Office (2018) *Regulatory framework for the Pilbara electricity networks: Design Consultation Paper*, 29 March, p.11.

## 2.2 PUO engagement of AEMO

The PUO is tasked with designing a new regulatory framework for Government's consideration, including:

- Regulated regime for third party access to 'covered' networks in the NWIS.
- Establishment of an ISO.

The PUO engaged AEMO to review the proposed ISO elements outlined in the Design Report and provide recommendations to improve the NWIS operations.

In summary, AEMO carried out the following review activities:

- Review and analyse the 35 design elements in the Design Report, including a minimum effective design for the NWIS ISO role.
- Identify organisational risks (to the ISO) in addressing the design elements and how they could be mitigated.
- Identify and resolve participant concerns that may inhibit the NWIS ISO establishment, implementation and operation.
- Identify and define the core NWIS ISO functions and powers required to meet the design objectives.
- Identify practical options for NWIS reform implementation.
- Determine indicative costs for the NWIS ISO establishment and implementation, and for the first 3 years of operation.
- These review activities have been supported by a comprehensive stakeholder engagement strategy and associated activities involving all key stakeholders from industry, government and within AEMO. Ongoing stakeholder engagement during subsequent phases of the NWIS reform process would be beneficial.

Chapter 6 (NWIS ISO Design Elements) provides further information regarding the review activities.

These review activities have been supported by a comprehensive stakeholder engagement strategy and associated activities involving all key stakeholders from industry, government and within AEMO. Chapter 7 (Stakeholder Engagement) provides further information regarding stakeholder engagement activity,

With AEMO's objective being to ensure the successful implementation of the NWIS reforms and operation of a NWIS ISO to deliver the Government's objectives, AEMO has progressed this work by:

- Focusing on operability and cost.
- Identifying NWIS ISO model options with implementation pathway structures.
- Recommending a NWIS ISO model option with fundamental principles, essential regulatory requirements and core functions.
- Identifying additional considerations required to further develop successive NWIS ISO model options with implementation pathway structures.

Based on the review activities and stakeholder engagement process, the Administrative ISO model is the optimal ISO model for the NWIS in its current operating environment. It meets the core objectives for NWIS reform in a 'least cost' and 'least intervention' manner, improves transparency in the operation of the NWIS, confers obligations and functions on the parties that are best-placed to manage them, and were widely accepted by participants during the stakeholder engagement process. Importantly, this model provides the essential platform for the strategic and structured future evolution of the NWIS, would support economic development in the Pilbara region and prosperity for Western Australia as a whole. Chapter 4 (NWIS ISO Models) provides further information regarding the three NWIS ISO model options that AEMO examined.

# 3. NWIS ISO Core Functions

Irrespective of the NWIS ISO model implemented, the NWIS ISO will require a minimum set of core functions to effectively perform its key role of ensuring the secure operation of the NWIS, and potentially any function it may be given in terms of power system reliability.

## 3.1 Core functions

For the NWIS ISO to perform its role effectively, there are a minimum set of functions required. The depth and breadth of these functions may vary depending on the operating model that is implemented.

The NWIS ISO core functions are:

- Maintain and manage the whole-of-system model.
- Operate the NWIS Rules.
- Determine the types and quantities of ancillary services needed in the NWIS and procure those ancillary services.
- Administer energy balancing ancillary services.
- Perform operational planning and outage coordination.
- Develop and apply an operational framework for NWIS ISO actions in emergencies and contingencies.
- Perform post-incident reviews and analysis.
- Undertake whole-of-system long-term planning (Integrated System Plan).
- Assess NWIS participant registration applications and maintain participant register.
- Recover NWIS ISO function costs.
- Undertake compliance monitoring and reporting.
- Facilitate dispute resolution processes under the NWIS Rules.
- Perform ancillary service settlement.

The following discussion assumes that NWIS network operators will retain responsibility for reliability i.e. for ensuring that there is sufficient supply to meet demand within their network (up to the desired risk level) on a day-to-day basis. As outlined in Chapter 4 (NWIS ISO Models), the more sophisticated NWIS ISO models require the NWIS ISO to take on reliability obligations to expand on the core functions described here in Chapter 3.

### 3.1.1 Whole-of-NWIS system model

A power system model is an essential tool for the safe and reliable operation of a power system. A 'steady state' power system model comprises a software representation e.g. PowerFactory, of the electrical topology

of a power system. The representation includes all capacities and ratings of generators and network devices, a representation of the loads on the power system and the electrical connection between them. This steady state power system model is used to assist in planning, both short and long term, to ensure the power system operates in a safe and reliable manner under normal operating conditions.

The addition of dynamic aspects, such as equipment, generator controls, governor controls and protection schemes, comprises the 'dynamic model'. The dynamic model is used to simulate the power system's response in real-time (the millisecond time scale) to:

- Credible and non-credible contingencies.
- Single and multiple contingencies.
- Control system/protection changes.
- Connection or disconnection of facilities.

A dynamic model can simulate the power system's response to system conditions that are difficult, if not impossible, to test safely or securely in the field.

Best engineering practice utilises the most accurate and up-to-date dynamic modelling to determine the power system's response to system disturbances.

Where a complete system model is not accessible or does not exist, as is presently the case in the NWIS, assumptions need to be made regarding the power system components that are unknown. This can (and does) lead to over or under engineering in the power system, with resultant unexpected/undesired responses from the power system.

The NWIS ISO is ideally positioned to maintain and manage the 'whole-of-NWIS' power system model. The NWIS ISO must be sufficiently empowered to collect each participant's model and combine participants' models into a consolidated 'whole-of-NWIS' model. To ensure the integrity of modelling data and quality of modelling outcomes, the NWIS ISO will need to be empowered to develop the technical requirements with which a participant's model must comply.

A framework for treatment of information must be sufficiently prescriptive to protect the confidentiality of participants' model data, while also allowing the NWIS ISO to use the model data, and to share the model data with a relevant party without compromising information confidentiality. The NWIS ISO will need to develop a procedure for participants to request modelling studies to be undertaken and for costs to be recovered.

### 3.1.2 NWIS Rules

A set of agreed, universally applied NWIS Rules is a significant outworking of the regulatory framework for the Pilbara electricity networks project. The NWIS Rules will provide a set of common access, operational and technical rules, including standards and connection assets that can be consistently and transparently applied with the oversight of the NWIS ISO.

The NWIS ISO will ensure the application of the NWIS Rules by participants and assist in the development and enhancement of the NWIS Rules without the commercial drivers or interests of participants. The NWIS ISO will be able to independently work with participants and an independent body responsible for changes to the NWIS Rules to progress amendments to, and creation of, rules. An exemption regime (including to existing assets), in addition to a mechanism for recovering costs associated with undertaking dedicated studies, may be necessary to ensure that standards do not impose unnecessary costs on NWIS network operators and stakeholders.

### 3.1.3 Ancillary services

Ancillary services are used to manage the power system safely and securely. These services maintain key technical characteristics of the system, including standards for frequency, voltage, network loading, and system restart processes.

The NWIS ISO will determine the required quantity of each type of ancillary service in line with the NWIS Rules, appropriately using the whole-of-NWIS model as necessary. The NWIS ISO will contract the required quantity of each type of service via a procurement process.

It is expected that the PUO will develop a cost allocation framework for ancillary services to ensure transparent allocation of costs associated with ancillary services.

### 3.1.4 Energy balancing

Network operators in the NWIS presently ensure that their generation meets their load at all times, so that the system is 'in balance'. In practice it is impossible to match the generation to load instantaneously, which means that there is frequently a small amount of imbalance in the system. Consequently, any imbalance is met by the party providing frequency control who acts to increase or decrease its generation output. This energy balancing is a service that is provided to the network operator whose generation and load are out of balance.

Assuming the present bilateral arrangements are retained post-NWIS reforms, the NWIS ISO will determine the amount of balancing energy that has been used in the system on a supply interval basis (15 or 30 min) in accordance with the process determined by the NWIS Rules. The cost of balancing services will be allocated to network operators as part of their accountability for the reliability of power within their network.

### 3.1.5 Operational planning and outages

To ensure the power system can be maintained in a secure and reliable operating state during the outage of a network or generation element, the outage's impact needs to be assessed. This assessment must include consideration of the effects of other planned and unplanned outages on the system. This information can then be used to determine the risk involved with a planned outage proceeding.

At present, network operators assess their own operation and commercial exposure to determine if a planned outage will proceed, and co-ordinate their planned outages with other network operators as they deem necessary.

As the holder of the 'whole-of-NWIS' power system model, the NWIS ISO must be sufficiently empowered to conduct power system studies on planned outages to assess their impact on power system security. Where the NWIS ISO's assessment finds that power system security is likely to be threatened, the NWIS ISO must be sufficiently authorised to require that the asset owner (i.e. network operator) undertake a specific action with respect to that outage. The action may include rescheduling the planned outage or undertaking other measures to reduce the risks of that outage e.g. load shifting.

### 3.1.6 Operational framework

Network operators will remain responsible for maintaining their generation and load balance and will retain responsibility for their own operations. As there are multiple interconnected networks in the NWIS, an issue within one network can potentially affect another. The NWIS ISO will therefore need to intervene to direct a participant to act in a specified way where power system security is threatened e.g. as a consequence of a contingency event or an emergency.

An operational framework is necessary to codify when and how the NWIS ISO may intervene in participants' day-to-day operations to carry out its responsibilities under its key function to maintain power system security. The framework will also prescribe how and when the NWIS ISO may authorise another relevant party (such as a network operator) to fulfil some of its responsibilities, where necessary or appropriate.

### 3.1.7 Post-incident investigation

When a localised incident occurs on the NWIS, it is incumbent on the owner of the assets responsible for instigating the event, to conduct a technical incident review to ensure that its equipment and associated systems operated as designed. This is a routine function and is consistent with good asset management and engineering practice. It is anticipated that the NWIS Rules will maintain this requirement on participants. It will be a function of a participant to manage its assets.

When an event threatens system security, that event will be managed through a combination of internal procedures, co-operative arrangements and NWIS ISO directions to relevant participants. The NWIS ISO will undertake a post-incident review to ensure that the power system performed as expected i.e. as modelled, that the actions of the participants and the NWIS ISO were in accordance with agreed processes and procedures, and that those processes and procedures were effective and fit for purpose.

The analysis of the power system's actual performance relative to the power system model allows the model to be validated or improved to ensure its ongoing accuracy. A review of the actions of participants and the NWIS ISO will ascertain whether any delegated responsibility given to another party was adequately performed, and whether the procedures or processes utilised were effectively operationalised.

Placing a requirement on the NWIS ISO for analysis and review, as part of post-incident review, will result in continuous improvement and effectiveness of the operation of the power system when an incident occurs in future.

### 3.1.8 Integrated System Plan

For the sustainable operation of any power system, long-term plans informed by likely changes in loads and generation facilities are essential. Without long-term planning, equipment may have insufficient capacity and redundancy to deliver the required power to the connected loads.

With commercial realities in the NWIS, and network operators being responsible for meeting their own loads, a traditional Electricity Statement of Opportunities (ESOO)<sup>2</sup> will add limited value to the participants of the NWIS. However, the development of an Integrated System Plan (ISP) may deliver significant value to existing and potential NWIS participants.

The ISP will deliver a strategic infrastructure development plan, based on sound engineering and economics, that consider a wide spectrum of interconnected infrastructure and energy developments, including transmission, generation and distributed energy resource<sup>3</sup>. The power requirements of existing and prospective participants will be forecast to facilitate the orderly development of the NWIS under a range of scenarios.

### 3.1.9 Participant registration

The effective operation of a NWIS ISO will require an efficient mechanism to identify the relevant parties on whom responsibilities and obligations would fall, and how (and when) those responsibilities and obligations are to be undertaken.

In the WEM within the SWIS, the registration regime fulfils this purpose and imposes requirements on registered parties, such as the requirement to provide specified information in the form of standing data i.e. technical information regarding equipment connected to the SWIS. Once registered, other obligations will fall

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<sup>2</sup> An ESOO provides technical and market data that informs the decision-making processes of market participants, new investors, and jurisdictional bodies as they assess opportunities in a specific region over a specific outlook period. AEMO produces these annual documents for the NEM and WEM over a 10-year outlook period. Clause 4.1.8 of the Wholesale Electricity Market Rules requires AEMO to develop and publish a WEM ESOO that presents AEMO's Long Term Projected Assessment of System Adequacy (PASA) for the SWIS in Western Australia. It reports AEMO's peak demand and operational consumption forecasts across a range of weather and growth scenarios for the 10-year Long Term PASA Study Horizon. The WEM ESOO is one of the key aspects of the Reserve Capacity Mechanism, which ensures that sufficient capacity is available to meet reliability targets set under the Long Term PASA study, and highlights the peak demand forecast under the expected demand growth scenario, which is used to determine the Reserve Capacity Target for the relevant Capacity Year.

<sup>3</sup> And potentially gas pipelines in future.

onto relevant parties in regard to ongoing data requirements, requirements to act on directions and instructions under prescribed circumstances, and obligations to pay prescribed fees and charges.

### 3.1.10 NWIS ISO cost recovery

The NWIS ISO will incur costs when delivering the core functions required, and it is logical for the NWIS ISO to have the function for recovery of those costs. There are a number of options for how the ISO budget could be approved (e.g. Economic Regulation Authority (ERA), the AEMO Board or the Government), and for how the costs could be recovered e.g. MWh fee based, service-based, equal allocation across network operators, Government. Chapter 5 \*NWIS ISO Governance Structure provides further information regarding cost recovery.

### 3.1.11 Compliance and enforcement

For the smooth operation of the power system in the NWIS, the NWIS ISO will monitor compliance to ensure that participants meet their obligations under the NWIS Rules and associated procedures with respect to relevant technical and operational matters.

The NWIS ISO will undertake post-incident investigations but may also conduct investigations periodically or where it considers that an investigation is warranted.

The NWIS ISO will not impose penalties directly or otherwise undertake enforcement action. It will provide information (such as the outcomes of any investigations) to the relevant regulatory body with responsibility for enforcement action. Recognising that the NWIS ISO will also be monitored, the enforcement function should be undertaken by another independent body. It is noted that the ERA currently undertakes this function for the WEM.

### 3.1.12 Dispute resolution process

The establishment of a NWIS ISO is contingent on the introduction of a common set of rules to support day-to-day operation of the power system. Consequently, the NWIS Rules will impose obligations on relevant parties for the management of contingency and emergency events, the assessment of proposed outages and the coordination, the transparent procurement and allocation of ancillary services.

Where there is a (non-commercial) disagreement between participants (including the NWIS ISO) with respect to their obligations under the NWIS Rules relating to power system operation, or otherwise in relation to alleged non-compliance with the NWIS Rules, a dispute resolution mechanism will be required to facilitate and resolve disagreements.

### 3.1.13 Settlements for ancillary services

The NWIS ISO will need to allocate costs of ancillary services in accordance with a transparent and equitable methodology, as prescribed by the NWIS Rules.

## 3.2 Delegations/authorisations

The regulatory framework will be required to accommodate the delegation of some NWIS ISO responsibilities, or otherwise authorise a suitable and relevant party to perform some NWIS ISO responsibilities, where it is necessary or appropriate, such as in an emergency situation.

The type of responsibility and the extent to which the responsibility can legally be delegated, or otherwise be performed by an authorised party, will depend on the NWIS ISO operating model (e.g. under the Administrative ISO model it is proposed that the NWIS ISO will not have real-time involvement managing the power system, and that network operators will be required to respond to a contingency where a network or generation element fails on their network).

In another example, under all proposed operating models, it may prove more cost-effective and practical for the NWIS ISO to delegate, or otherwise have an authorised third party perform the role of metering data agent (where this role is required).

# 4. NWIS ISO models

Review outcomes of NWIS ISO model options.

## 4.1 NWIS ISO - model options

As part of its review activities, AEMO examined three models for operationalising an ISO for the NWIS. The first and most basic model comprises only the core NWIS ISO functions, as outlined in Chapter 3 (NWIS ISO Core Functions). Recognising that more extensive NWIS ISO functions and powers may achieve greater benefits, albeit with greater implementation and ongoing operational costs, AEMO examined two additional NWIS ISO model options.

The three NWIS ISO model options are:

- Administrative ISO model: Undertake the core functions, with a proceduralised operational framework for NWIS ISO actions in emergencies and contingencies.
- Operating ISO model: Undertake the core functions, with the addition of 24/7 visibility and coordination.
- Full ISO model: Similar to the Wholesale Electricity Market and the National Electricity Market models (i.e. dual power system and market operation functions).

All three of the NWIS ISO models that were considered are likely to realise the following industry benefits:

- A common agreed set of rules, with a robust rule change process.
- Transparent procurement of appropriate levels of ancillary services.
- Obligations on participants to respond to system events (initially in the form of operating procedures and delegations to execute those procedures).
- Protections for participants when delegated functions by the NWIS ISO.
- Outage coordination across the entire system, with plans appropriately published for all participants.
- A single independently managed system model.
- A forward-looking Integrated System Plan (ISP).

*Note: all costing estimates provided for the below model options are approximations only, and AEMO does not guarantee accuracy of the information (+/-50% accuracy).*

### 4.1.1 Administrative ISO model

#### **Benefits**

In addition to the abovementioned industry benefits, the Administrative ISO model:

- Leverages existing practices and requires minimal industry cost and resource allocation.
- Enables transparent service provision and accountability.
- Improves security and stability of the power system.

- Improves efficiency through greater coordination of network development and greater utilisation of existing network assets.
- Improves productivity and encourages economic development in the Pilbara region.

## Functions

The Administrative ISO model is comprised of the following functions:

- Core NWIS ISO functions (see Chapter 3).
- Detailed contingency/emergency NWIS operating protocols.
- Delegation of authority/authorisations to coordinate and execute the NWIS operating protocols.

The Administrative ISO model does not have any real-time capability, including power system visibility, and will require network operators to continue to monitor and manage their individual networks within technical and commercial envelopes.

Under this model, the timeframe for operational planning and outages ranges from two weeks to two years.

## Detailed NWIS operating protocols

The core NWIS ISO functions require an operating framework to determine when and how the NWIS ISO may intervene to manage contingencies and emergencies to ensure power system security is maintained.

However, without the NWIS ISO having real-time visibility, more detailed operating protocols will be required to manage power system security.

The contingency and emergency events for which protocols will be developed are events that have occurred historically or are otherwise readily identifiable. For many of these events, network operators will already have operating protocols in place to manage them. The NWIS ISO will leverage existing operating protocols and input from all network operators to ensure new fit-for-purpose NWIS operating protocols are developed with full technical and operational understanding of an event. The outcome will be a set of formalised and enforceable NWIS operating protocols that will prescribe role responsibilities and impose obligations on all relevant parties (i.e. network operators under the Administrative ISO model).

Where a NWIS operational protocol exists for an event and the event occurs, the post-incident review will assess the use and effectiveness of the NWIS operating protocol to enable continuous improvement.

Where a formal operating protocol does not exist for an event, the overarching framework will provide guidance to manage the event and maintain or restore power system security. As part of the post-incident review process, it will be determined whether a new or modified NWIS operating protocol for such an event is required, and if required, the NWIS Rules will require the NWIS ISO to develop one in collaboration with network operators.

In the event of a large system event, such as a cyclone or system black, the NWIS ISO would perform a coordination role, similar to that taken by the PUO under the *WestPlan - Electricity Supply Disruption* (dated May 2016) for the SWIS. This will provide centralised oversight to ensure that the system is managed/recovered in a coordinated manner.

## Delegations

The NWIS ISO will not have real-time visibility of the NWIS, so it cannot direct the actions of participants in response to events. Therefore, to maintain or return the power system to a secure state, the NWIS operating protocols and operating framework will be developed and documented in advance of the commencement of the access regime to give participants an understanding of the actions they will be required to take in specified situations.

Under the NWIS operating protocols, the relevant network operator will be required to coordinate, and potentially direct actions, in response to an event on behalf of the NWIS ISO. To enable this coordination and direction, and to ensure that other network operators meet their obligations, the network operator will

require the delegated authority of the NWIS ISO and the commensurate level of legal protection. The delegation framework must therefore be robust, clear and structured so that no situation arises where two or more network operators concurrently attempt to exercise the delegated coordination authority of the NWIS ISO (and receive the commensurate level of legal protection). The NWIS ISO will also require a level of legal protection under the NWIS Rules where it does not have real-time visibility and cannot control the actions of its delegated authorities.

## **Risks**

Key risks to mitigate as part of the Administrative ISO model are:

- Cost recovery.
- Ancillary services contract.
- Operational framework and protocols.
- Delegation structures.

### **Cost recovery**

The NWIS has never had a central body providing oversight, with each network operator being responsible for their own operations, whether self-supplied or through commercial arrangements. Consequently, there is a risk that one or more network operators may disagree with the cost for NWIS ISO operation and how that cost is allocated. Network operators may consider that they have been allocated an 'unfair' portion of the cost and may seek to challenge the requirement to pay for services that they believe they have traditionally provided for themselves and/or other participants.

There is a similar risk in relation to the allocation and recovery of costs for ancillary services. As with NWIS operation, network operators have been responsible for procuring sufficient ancillary services to meet their own needs. Potentially, network operators may consider that they pay 'more' for a service they 'don't need'.

The risk can be mitigated by applying a transparent cost allocation methodology.

### **Ancillary services contract**

The NWIS ISO will not dispatch ancillary services under the Administrative ISO model. Consequently, there is a risk that the ancillary service provider does not (consciously or otherwise) dispatch sufficient ancillary services to meet its contractual obligations, and that the NWIS ISO is unaware of this failure.

The mitigation of this risk relates to regular review of the performance of the provision of ancillary services, through the settlement and post-incident review processes, and through ad-hoc reviews performed in the course of system studies.

### **Operational framework and protocols**

As identified in section 3.1.6, an operational framework must be established to identify when and how the NWIS ISO will intervene in the operation of the NWIS. Under the Administrative ISO model, there is no real-time visibility of the power system, which precludes real-time intervention to manage contingency or emergency events in the NWIS.

There is a risk of disagreements regarding the content/actions required in the NWIS operating protocols, or regarding the contingencies that should or should not be covered. There is also a risk that the final protocol is insufficient to restore or recover the power system. These risks can be mitigated by having all network operators and other applicable parties collaboratively develop the protocols in the first instance, and by having a robust post-incident review process to ensure that the protocol remains fit for purpose.

The delegation of powers and legal protection to a single responsible party for each protocol will allow for a coordinated approach to the execution of the protocols and will also allow real-time oversight of the restoration or recovery of power system security.

## Delegation structures

The effective management of, and recovery/restoration from a contingency or emergency event, requires the involvement of a single operating protocol coordinator. To ensure that this coordination is executed in a way that all network operators meet their obligations under the operating protocol, the coordinator for the event must act under the delegated authority of the NWIS ISO and must hold the commensurate level of legal protection. There are risks if the delegation framework is not sufficiently developed.

One risk is that a network operator may exercise the NWIS ISO's delegation at a time when it is not warranted and in a way that has a material impact (commercial/financial or otherwise) on another network operator's operations. In theory, a network operator may purport to act under a delegated authority for an improper purpose.

Another risk is that multiple network operators may invoke a delegated authority at the same time, leading to a confusing and sub-optimal outcome for the power system and its participants.

To mitigate these risks, a robust, clear and concise delegation structure will need to be developed under the NWIS Rules, coupled with a rigorous post-incident review process. The review will ensure that the delegation structure is fit for purpose, that all participants act within the scope of their delegated authority and respond appropriately when another party exercises its delegated authority.

## Cost

The functions of the Administrative ISO model are a base level requirement for all the optional ISO models, and their costs will need to incorporate those of the Administrative ISO model.

The majority of the costs related to the Administrative ISO model are personnel, as there are no real-time systems to build, operate and maintain. Any system required for the Administrative ISO model must be simple, fit for purpose, and where possible and appropriate, should leverage existing systems within the NEM or WEM.

The systems include, but are not limited to:

- Participant Interface:
  - Registration tool
  - Outage logging tool
  - Outage coordination tool.
- Power System Model
- Ancillary Service Tool:
  - Frequency Control Ancillary Service (FCAS) allocation and settlement
  - Balancing Settlement.

## Implementation

The development and operationalisation of the NWIS operating protocols will also be a cost incurred for the implementation of the Administrative ISO model. This cost is dependent on the number and complexity of the operating protocols.

The cost estimate of the development and implementation of these systems and associated processes and procedures is \$1.1 million, which includes project management and associated overheads.

## Operation

There will be a number of direct and indirect costs required to operate the Administrative ISO model. These include but are not limited to:

- Planning engineers

- Market analysts
- System support
- System operations
- Compliance and reporting
- Management oversight
- Corporate overheads.

The total operational labour is estimated to be four Full Time Equivalents, allocated across a number of functional areas with some consultancy required for major technical reports (as per the WEM and NEM).

The estimated operational cost is \$1.2 million per annum.

### **Timeline**

The PUO is targeting implementation of the Pilbara 'light handed' Electricity Reform on 1 January 2020. To meet this timeframe, a transitional approach will likely be required, which would involve initial minimum requirements in place and a transition plan to the final Administrative ISO model.

The minimum functions required to be in place prior to the transition are the NWIS ISO cost recovery mechanism and ancillary services, cost allocation and settlement processes. The NWIS operating protocols can be developed through the transition period, though it will be beneficial to have as many protocols in place as possible before the targeted implementation date. The operating and delegation framework, the system restart protocol and the cyclone and flood protocols will need to be in place prior to commencement. These protocols and frameworks should be developed in consultation with stakeholders and will need to be consistent with the overarching legislation and subsidiary instruments. To achieve this, regulatory arrangements will need to be in place by June 2019.

Once the Administrative ISO model is implemented, a transition process of approximately 18 months will be required to achieve full functional operation. This timeframe will allow extensive modelling to validate operating protocols and ancillary services requirements, and to allow participants to smoothly transition into the full Administrative ISO model.

#### **4.1.2 Operating ISO model**

### **Benefits**

In addition to the abovementioned industry and Administrative ISO model benefits, the Operating ISO model:

- Provides 24/7 visibility of the power system in real-time.
- Allows rapid response and coordination of system disturbances.
- Allows ISO functionality to evolve with changes to the NWIS Rules.
- Allows real-time 'tuning' to increase power system efficiency while maintaining security.

### **Functions**

The Administrative ISO model is comprised of the following functions:

- Core ISO functions (see Chapter 3).
- 24/7 visibility and monitoring of power system.
- Real-time response (including issuing directions) to manage contingencies.
- Real-time compliance monitoring of ancillary services.

The Operating ISO model has real-time power system supervisory control and data acquisition (SCADA) visibility and will allow the NWIS ISO to monitor and direct (where appropriate) network operators to ensure that the power system operates in a safe and secure manner. Even though there is SCADA visibility under the

Operating ISO model, bilateral energy contracts remain in place and the NWIS ISO has no role in dispatching energy or ancillary services under this model.

The operational planning and outages (Section 3.1.5) timeframe for the Operating ISO model could be two days.

## Risks

The key risks to mitigate as part of the Operating ISO model are:

- Cost recovery
- NWIS ISO interventions:
  - Ancillary services
  - System operation.

### Cost Recovery

The cost recovery risk for the Operating ISO model is the same risk as identified in the Administrative ISO model.

As per the Administrative ISO model, this risk can be mitigated by having a transparent cost allocation methodology based on the principle of value of service developed through stakeholder engagement.

### NWIS ISO interventions

*Ancillary services.* As the Operating ISO model will have SCADA visibility, the NWIS ISO may potentially overreach in the dispatch of ancillary services. This is because the NWIS ISO can see in real time which loads and generation are online, and may look to intervene to ensure that the energy balance is maintained.

The risk is that any overreach into dispatch (real or perceived) may undermine the NWIS ISO's independence and trust in the NWIS ISO. This risk can be mitigated by clear and concise control room instructions, training and routine operating reviews.

*System operation.* With real-time visibility of the power system, the NWIS ISO can provide a controller to monitor the system 24/7, via a standalone operational desk (high cost) or via integration with another operational desk (attention significantly diluted by other tasks). The controller will not be responsible for dispatch or managing the day-to-day operation of the system. There is a potential risk that this mode of operation may prevent the controller from gaining experience in the day-to-day operation of the system, which is crucial when managing a contingency or emergency event.

To mitigate this risk, a standalone control desk plus control room guidelines will need to be established, and training provided. The guidelines will detail the routine tasks that must be performed to enable effective real-time monitoring of the power system, and to ensure that timely and appropriate actions are taken in response to contingency and emergency events.

## Cost

### Implementation

The implementation cost of the Operational ISO Model includes the costs for the Administrative ISO model with the addition of the infrastructure and systems to provide 24/7 SCADA visibility.

The additional cost for implementation of the Operating ISO model includes:

- Energy Management System (EMS) displays
- EMS 'system' (servers, communications, licences)
- SCADA/ICCP database build

- Network database build
- Dispatch Training Simulator (DTS) database build
- PI database build
- Training and documentation.

The number and complexity of the NWIS operating protocols will be somewhat less, compared to the Administrative ISO model, but the 24/7 nature of the control room monitoring will require the development of control room guidelines. The estimated additional cost of the 24/7 SCADA visibility is \$4.5 million. The total estimated implementation cost, when combined with the cost of the Administrative ISO model (\$1.2 million), is \$5.7 million.

## Operation

To operate the Operating ISO model there will be a number of costs in addition to the operating costs of the Administrative ISO. These additional costs include, but are not limited to:

- Control room staff
- System support staff
- Software licences
- Business continuity equipment/facilities.

The total operational labour is estimated to be 14 Full Time Equivalents, allocated across several functional areas with some consultancy required for major technical reports (as is done in the WEM and NEM).

The estimated operational cost is \$4.8 million per annum.

## Timeline

The estimated timeline for design and implementation of the Full ISO model is 18+ months.

This estimate is based on previous work involved in relocating AEMO operations from Western Power in East Perth to the Perth CBD, and the transition from the Western Power SCADA system to the AEMO SCADA system.

Significant portions of this work are the development and testing of the new databases, displays and the installation, testing and commissioning of the communications infrastructure (ICCP) between the Network Operators and the NWIS ISO.

### 4.1.3 Full ISO model

#### Benefits

The Full ISO model has been explicitly dismissed as a viable option in the Design Report. However, to ensure that there is a comprehensive review of potential model options, the Full ISO model has been included for consideration in terms of needs analysis and implementation practicality.

While the Full ISO model shares the industry benefits with the Administrative ISO and Operating ISO models, it does so with considerably higher relative cost and resource allocation requirements, and with minimal correlated benefits in the current NWIS operating environment.

The Full ISO model could only be considered as a justifiable option if the system becomes significantly larger and more complex (in terms of load, generation and interconnection), which is an unlikely scenario in the short to medium term.

If the system reaches a level of sophistication and complexity that justifies consideration of such a model, the potential benefits could include:

- Optimising efficiency in use of generation capacity.
- Minimising contracting complexity for participants.

- Allowing co-optimisation of energy and ancillary services dispatch.

### **Risks**

- Model implementation would not progress under current system conditions due to:
  - Inconsistency with the PUO's position on retaining existing bilateral arrangements and dispatch conditions.
  - Cost relativity to other model options e.g. the NWIS ISO will be required to 'purchase' existing contracts and negotiate new contracts.
  - Industry stakeholder resistance to the removal of flexibility and scope to manage their own operational risks.
  - Transferal of operational risk (and resultant exposure) from participants to the NWIS ISO.

### **Cost**

The functions of the Administrative ISO model are a base level requirement for all the various NWIS ISO models, and their costs will need to incorporate those of the Administrative ISO model.

In addition, the costs to implement and sustain the Full ISO model have been estimated based on the correlating NWIS ISO role currently performed by AEMO in the WEM and NEM.

The estimated implementation and per annum operational cost of the Full ISO model is in the order of \$50 million and \$8 million respectively (dependent on scale and complexity) as it incorporates:

- Significantly greater design and development scope.
- Requirement for interaction with an energy market (the cost for developing, designing and implementing a market is not included in the above cost).
- Requirement for ancillary service provision.

### **Timeline**

The estimated timeline for design and implementation of the Full ISO model is 3+ years.

This estimate is based on the current program timeline for the WEM Reform, which is scalable in terms of NWIS ISO scope and intervention.

## 4.2 Model option summary

**Figure 2 Model option responsibilities and management**

Regulatory Regime Implementation – Model Option Responsibilities and Management			
Core Regulatory Regime Responsibilities	Regulatory Regime Model Options		
	1. Administrative	2. Operating	3. Full ISO
	Regulatory Regime Responsibility Management		
ISO function (high level)	NWIS power system security	NWIS power system security	NWIS powers system security and supply reliability
ISO presence	Post-incident	24/7 monitoring desk	24/7 active desk
Energy contracts	Bilaterals	Bilaterals	Market mechanism (including bilaterals)
Ancillary services	Contract	Contract	Market, contract, dispatch
Response (events)	<ul style="list-style-type: none"> <li>NO: Event Mitigation Protocols</li> <li>ISO: Post-incident investigation</li> </ul>	ISO Directions	Co-optimised dispatch via dispatch instruction from ISO
Action trigger	Emergency conditions – delegation under protocols	Operating State triggers / contingency events	Real-time operation
Settlement	Reconciliation of costs	Reconciliation of costs	Settlement agent
Capacity	No capacity mechanism (i.e. Bilaterals plus AS)	No capacity mechanism (i.e. Bilaterals, AS plus Ready Reserve requirement)	Full Reserve Capacity Mechanism
Outages	ISO co-ordinated (i.e. deemed approved unless directed by ISO to cancel)	Availability framework	Availability framework
Compliance / enforcement	Reporting	Reporting and monitoring	Reporting and monitoring
Planning	ISP (Integrated System Plan) + MT PASA	ISP + MT/ST PASA	ISP + LT/MT/ST PASA + Pre-dispatch

## 4.3 Model recommendation

Implementation costs for the Government, AEMO and industry are comparatively low for the Administrative ISO model relative to the Operating ISO and Full ISO models, as the Administrative ISO model leverages existing operating practices in the NWIS by consolidating and formalising those practices into an ISO operating framework and protocols.

The framework and protocols include detailed contingency/emergency operating protocols, coupled with delegations of authority to execute those protocols. The protocols and delegation authority will ensure transparency and accountability in service provision to improve the security and stability of the NWIS.

AEMO’s assessment is that the Administrative ISO model is the optimal ISO model for the NWIS in its current operating environment. It meets the core objectives for NWIS reform in a ‘least cost’ and ‘least intervention’ manner, improves transparency in the operation of the NWIS, confers obligations and functions on the parties that are best-placed to manage them, and was widely accepted by participants during the stakeholder engagement process.

Importantly, this model provides the essential platform for the strategic and structured future evolution of the NWIS and would support economic development in the Pilbara region and prosperity for Western Australia as a whole.

# 5. NWIS ISO governance structure

AEMO supports the establishment of a framework within an appropriate legislative instrument for the conferral of the NWIS ISO functions, the establishment of NWIS Rules, oversight of the NWIS ISO by an independent regulator (potentially the ERA), and a cost recovery mechanism to support the determination and recovery of the NWIS function costs from NWIS participants.

## 5.1 NWIS ISO governing body

The Design Consultation Paper<sup>4</sup> and the Design Report<sup>5</sup> propose that the NWIS ISO should be governed by an independent board<sup>6</sup> and set out two options for the NWIS ISO Board<sup>7</sup>:

1. AEMO Board (if the NWIS ISO functions are delivered by AEMO).
2. Board of participants.

Of the two options, the PUO proposes the adoption of the AEMO Board as the governing body for the NWIS ISO<sup>8</sup>.

AEMO is an independent, not-for-profit organisation with proven experience in power system and market operation. A governance arrangement that would require AEMO to cede its independence is inconsistent with AEMO's internal governance and its current operation in the WEM/SWIS, and with regard to the GSI arrangement.

AEMO recommends a staged approach to transition to a two-tiered governance structure for the NWIS if the AEMO Board option is implemented:

- Implementation phase:
  - An overarching strategic reference group led by the PUO, comprising of AEMO and industry stakeholders.
  - Final approval of reform design by the PUO (and the AEMO Board for matters included in AEMO's scope of functions).

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<sup>4</sup> Department of Treasury – Public Utilities Office (2018) *Regulatory framework for the Pilbara electricity networks: Design Consultation Paper*, 9 February.

<sup>5</sup> Department of Treasury – Public Utilities Office (2018) *Regulatory framework for the Pilbara electricity networks: Design Report*, 29 March.

<sup>6</sup> Design Consultation Paper, p.ix; and Design Report, p.4.

<sup>7</sup> Design Consultation Paper, pp.53-54' and Design Report, pp.70-71.

<sup>8</sup> Design Consultation Paper, p.55; and Design Report, p.71.

- NWIS ISO post-establishment:
  - An industry strategic reference group to advise on key matters, such as proposed changes to power system operation procedures or the NWIS Rules.
  - Final approval by the AEMO Board (or an AEMO Board delegate) and/or the ERA as specified by the NWIS Rules on prescribed matters.

#### Design Element 27

The ISO will be a stand-alone entity, with the proposed functions undertaken by AEMO as an extension of its current Western Australian operations, noting that it may choose to contract with other network service providers for provision of some services.

#### Design Element 30

The ISO will be governed by the AEMO Board on the basis that AEMO undertakes the ISO role for the NWIS. Its charter will be established with the involvement of key stakeholders.

## 5.2 Statutory protection

The NWIS ISO would need to have at least the same statutory protection (immunity) as AEMO has for its system management functions in the WEM<sup>9</sup>.

The Design Report indicates industry support for this position<sup>10</sup>. It proposes that the NWIS ISO be provided with statutory protection from third party damages claims that may arise from the performance or purported performance of the NWIS ISO's functions. Crucially, therefore, the NWIS ISO's statutory functions (as conferred by legislation, regulations and the NWIS Rules) must not require the NWIS ISO to perform activities that impact on the commercial operations of participants (and hence connected load operations) more than is necessary in the exercise of its key functions. This statutory protection for the NWIS ISO should also extend to situations where it has delegated its function to a third party.

#### Design Element 34

The ISO will have the same immunity from damages claims as AEMO has for its operations in the SWIS.

## 5.3 NWIS surveillance

The Design Consultation Paper and the Design Report propose that, in the NWIS, the surveillance functions are likely to include<sup>11</sup>:

- Monitor NWIS ISO performance.
  - It is proposed that the NWIS ISO (and its network service providers) would self-report according to a pre-determined framework.

<sup>9</sup> Section 126 of the *Electricity Industry Act 2004* provides statutory protection (immunity) for specified parties, including a market governance participant in respect of acts or omissions made in good faith during the performance or purported performance of functions. The immunity does not apply for negligent acts or omissions, and instead a civil monetary penalty applies. The level of penalty is capped at an amount specified in regulation 52 of the *Electricity Industry (Wholesale Electricity Market) Regulations 2004*.

<sup>10</sup> Design Report, p.78.

<sup>11</sup> Design Consultation Paper, p.55; Design Report, p.72.

- Monitor aspects of participant business conduct that are within the scope of the NWIS Rules (such as ancillary service usage and payments).
- Exercise disciplinary powers defined in the NWIS Rules.
- Make recommendations for changes to the NWIS Rules.
- Investigate issues in accordance within a specified scope (i.e. as specified in the NWIS Rules).

The Design Report proposes an arrangement whereby the ERA is contracted by the NWIS ISO to provide market surveillance services for the NWIS. The basis for this proposal is that the ERA currently undertakes SWIS market surveillance, so NWIS market surveillance would be an extension of its current activities<sup>12</sup>.

AEMO considers that a surveillance arrangement similar to that in the WEM would be suitable for the NWIS. The NWIS ISO is ideally placed to monitor and report<sup>13</sup> on participants' non-compliance with obligations imposed by the NWIS Rules and the ongoing costs of ancillary services. The NWIS ISO would also report to the ERA, and publicly on the findings of any investigations into emergency situations and instances where network customers prevented a participant from complying with any direction issued by the NWIS ISO. The ERA could be given the power to take compliance enforcement action under the NWIS Rules in appropriate cases.

The ERA would use all reported information in making its annual assessment of the NWIS ISO's performance and of the effectiveness of the regulatory arrangements in the NWIS. It is expected that the ERA's surveillance would inform the PUO's ongoing consideration on whether the Administrative ISO model is sufficient to support the needs of the NWIS, or whether the NWIS would benefit from further regulation i.e. progressing to the Operational Model or the Full ISO model.

For the ERA to undertake surveillance (and potentially enforcement) in the NWIS, and to recover costs for its activities, the NWIS Rules will need to confer a relevant NWIS surveillance function on the ERA.

As this is a governance matter, the PUO will lead design development and take responsibility for undertaking consultation with other stakeholders on the NWIS ISO's monitoring and reporting responsibilities, and the ERA's surveillance function.

### Design Element 31

The ISO surveillance functions will be provided to the ISO governing body by the ERA.

## 5.4 NWIS ISO funding - cost allocation and recovery

The Design Consultation Paper proposes that the cost of establishing and operating the NWIS ISO should be kept to a practical minimum,<sup>14</sup> and should be recovered from participants<sup>15</sup>.

The Design Report suggests that the NWIS ISO funding arrangement will be the same as applied in the SWIS<sup>16</sup>:

- AEMO will apply to the ERA for its allowable revenue and forecast capital expenditure which will incorporate its NWIS-specific costs on a triennial basis.

<sup>12</sup> Design Report, p.72.

<sup>13</sup> Quarterly, or in any case, at least annually.

<sup>14</sup> See Design Element 20 in the Design Consultation Paper, p.36.

<sup>15</sup> See Design Elements 24 and 29 in the Design Consultation Paper, p.51 and p.58.

<sup>16</sup> Design Report, p.73.

- System operator costs will be allocated on an equitable and NWIS fit-for-purpose basis i.e. charged on a per-MWh basis to loads and generators as in the NEM and WEM and recovered through fees.

A triennial allowable revenue and forecast capital expenditure process for the NWIS will align with AEMO's current funding arrangements under the Wholesale Electricity Market Rules (WEM Rules) and the Gas Services Information Rules (GSI Rules)<sup>17</sup>. Potentially, AEMO could streamline its processes to accommodate a submission to the ERA for all of its function costs under the WEM Rules, the GSI Rules and the NWIS Rules. The ERA may then determine the level of fees to be charged to WEM, GSI and NWIS participants.

The NWIS ISO funding arrangements need to be streamlined, right-sized and cost-effective, having regard to the relatively small scale of the NWIS, so that the NWIS ISO and the body that approves its expenditure do not incur unnecessary administrative overheads. An alternative option worth consideration, particularly given the relatively low cost of some of the NWIS ISO models, is utilising the budget process that applies to AEMO in the NEM. This process sees AEMO determining its required budget in consultation with stakeholders, and the AEMO Board subsequently approving the expenditure. Another alternative, which may be less suitable, is the funding arrangement utilised for AEMO's gas hubs, where costs are recovered through a defined fees basis from those parties who voluntarily use the service. A further alternative, raised in one-on-one stakeholder meetings with AEMO, is that Government could cover the establishment cost of the ISO.

Feedback from the PUO design workshops indicates that the allocation of the NWIS ISO's function costs, specifically in regard to system operation and planning (including the running of the system model), should be allocated in a manner that is simple, equitable and non-distortionary. AEMO recommends a simplified approach to cost allocation for the NWIS ISO function costs. The most common method for allocation of core ISO costs is on a usage e.g. MWh basis. However, as a market is not proposed for the NWIS and each network operator predominantly looks after its own requirements, there may be a justifiable case for equal cost sharing across each of the network operators.

Similarly, a simplified approach would be appropriate for FCAS settlement, which would not necessarily be based on the real-time use of the ancillary service.

Other services provided to network operators on request, such as non-scheduled runs of the system model, could be changed on a user-pays basis.

## 5.5 Role of ERA

The analysis and recommendations in this report are aligned with the functions proposed for the ERA in the NWIS, as described in the Design Consultation Paper and the Design Report.

These functions include:

- Administer a dispute resolution framework (for the third party access regime).
- Approve the NWIS ISO's annual revenue and forecast capital expenditure.
- Undertake NWIS ISO surveillance.
- Administer the rule change process for NWIS Rules.

As these functions relate to the governance of the NWIS, the PUO is responsible for engaging with the ERA to understand its capacity to undertake these functions, and to identify the requisite changes to the regulatory framework to sufficiently empower the ERA to do so.

In regard to compliance and enforcement (a function not covered in detail in the Design Consultation Paper and Design Report), AEMO's understanding from the PUO-led workshop on

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<sup>17</sup> The GSI Rules were modelled on the WEM Rules in regard to arrangements for fees and charges.

NWIS ISO establishment is that the PUO will discuss a proposed design (as set-out in section 6.8) directly with the ERA.

# 6. NWIS ISO Design Elements

The NWIS ISO design elements proposed in the Design Consultation Paper will be achieved, or otherwise modified, under the Administrative ISO model.

The Administrative ISO model was widely accepted by participants during the stakeholder engagement process.

AEMO has therefore focused review activities and outcomes on the design elements as applicable to the Administrative ISO model, noting that future reform and associated modelling and review activities may be required as the NWIS evolves.

## 6.1 NWIS ISO key function – system security

Design element 20 in the Design Consultation Paper and the Design Report articulates the NWIS ISO's core function as being "to ensure the reliability and stability of the system"<sup>18</sup>. The proposed powers and responsibilities that stem from this core function are a consequence of the design principles adopted by the PUO for the NWIS ISO, in which one design principle is that the system operator is responsible for "keeping the lights on".

In the WEM/SWIS, the WEM Rules confer upon the system operator (AEMO) the function of ensuring that the SWIS operates in a secure and reliable manner<sup>19</sup>. Although the WEM Rules do not specifically define 'reliable' or 'reliability', it is clear from the operation of the WEM Rules that this means 'power system reliability', of which there are network reliability and supply adequacy aspects<sup>20</sup>.

To the extent that reliability in the NWIS is the responsibility of the network operators under bilateral contracts, AEMO considers that it would be appropriate for the NWIS ISO's core function to be limited to ensuring the security of the power system.

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<sup>18</sup> Design Consultation Paper, p.36; Design Report, p.51.

<sup>19</sup> The WEM Rules are made under s.123(1) of the *Electricity Industry Act 2004* and reg.5 of the Wholesale Electricity Market Regulations:

- Clause 2.2.1 confers on AEMO the function of ensuring that the SWIS operates in a secure and reliable manner for the purposes of regulation 13(1) of the WEM Regulations.
  - Regulation 13(1) requires the WEM Rules to confer on an entity the function of ensuring the SWIS is operated in a secure and reliable manner.

<sup>20</sup> Supply adequacy is the reliability of supply, including generation and demand management, to adequately meet customer demand for energy within the power system. It is assessed by accounting for the reliability of supply elements - generating plant capability, forced outages, and the power transfer capability of the network. In the SWIS, AEMO is responsible for ensuring that there is a sufficient level of generation adequacy via the purchasing of Reserve Capacity.

Feedback received from stakeholders through the consultation processes managed by the PUO and AEMO showed strong support for a more limited-scope core function, and for the Administrative ISO model that operationalises it.

A limited-scope NWIS ISO core function is consistent with the role responsibilities allocated to network operators in the Design Consultation Paper. A network operator is to ensure it has “adequate capacity to meet forecast consumer requirements and performance standards, cognisant of planning criteria that account for planned and unplanned contingencies (outages) and generation configurations”.<sup>21</sup>

The benefits of a limited-scope NWIS ISO core function are two-fold and consistent with design elements 20, 21 and 33 in the Design Consultation Paper. First, the breadth of the NWIS ISO intervention is minimal and restricted to emergency situations only, so its ability to interfere does not affect the normal day-to-day commercial operations of network operators. Second, the role responsibilities of the NWIS ISO and network operators are transparent in that they can be easily identified and prescribed in the regulatory instruments, resulting in substantially reduced operational, commercial and compliance risk as the obligations on relevant parties and operational processes are clear.

#### **Design Element 20**

The design principles for the ISO are that:

1. the ISO's core function is to ensure the reliability and stability of the system;
2. the ISO should act with impartiality and transparency;
3. the ISO should act to maximise overall system efficiency;
4. the cost of establishing and operating the ISO should be kept to a practical minimum;
5. proposed arrangements should consider the commercial interests and priorities of privately-owned electricity network assets in the NWIS;
6. technical standards should not present a physical constraint to potential future interconnection of the NWIS, or a barrier to any technology type; and
7. the effectiveness of the ISO should be reviewed periodically.

#### **Design Element 21**

The ISO will undertake planning, scheduling and dispatch services for the NWIS interconnected network and will:

- develop and manage a full NWIS simulation model; and
- have lead accountability for managing emergency response and post-incident investigations.

#### **Design Element 33**

The ISO will have coverage of the entire NWIS Interconnected System, with powers limited to those necessary to undertake its assigned functions consistent with the design objective.

For the avoidance of doubt, the ISO will not have powers to interfere with the efficient operations of networks, other than to protect the security and reliability of the NWIS and these powers do not necessarily require direct control of all network elements.

Any changes to the powers of the ISO will be subject to rigorous analysis with stakeholder input to ensure that there is a material net benefit of any proposed changes.

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<sup>21</sup> Design Consultation Paper, pp.46 and 37; Design Report, pp. 61 and 52. The network operator is to be responsible for:

- network investment decisions; and
- ensuring that they have adequate capacity to meet forecast consumer requirements and performance standards, cognisant of planning criteria that account for planned/unplanned contingencies (outages) and generation configurations.

Design element 21 in the Design Report is more prescriptive than that in the Design Consultation Paper and proposes that the NWIS ISO should issue dispatch instructions in limited circumstances<sup>22</sup>; these matters are covered in section 6.6 below.

### 6.1.1 NWIS ISO powers and responsibilities

The Design Consultation Paper and the Design Report articulate a further list of powers and responsibilities that the NWIS ISO will need in performing its key function<sup>23</sup>:

“1. Planning, scheduling and dispatch:

- a) Direct network operators, network owners, generators and loads to protect the safety, security and reliability of the NWIS during system emergencies.
- b) Manage the enhancement and maintenance of a fit-for-purpose, NWIS model.
- c) Approve or otherwise coordinate planned outages of network or generation elements on all interconnected networks to mitigate material risk to system security and performance (expected to be similar to the power system performance and connection standards in Horizon Power’s Technical Rules).
- d) Set and monitor load shedding facilities.
- e) Access data from participants to support the development of generator, load and energy forecasts and all necessary real-time and near real-time information to undertake its schedule and dispatch functions.
- f) Develop and implement power system operating procedures.

2. Network services:

- a) Oversee the compliance of new connections and modifications to existing installations (loads, generators, networks) in all networks in the NWIS Interconnected System in accordance with agreed, common NWIS Rules, to help ensure the performance and security of the NWIS.
- b) Publish ‘statements of opportunity’ for transmission and generation development with the appropriate adherence to approved confidentiality protocols.

3. Access to information to support:

- a) ancillary services management;
- b) market services; and
- c) metering services;

to the extent they are initially assigned.

4. Ability to enter into contractual and other arrangements to manage NWIS ISO functions.

5. Recovery of reasonable costs from those who benefit from the NWIS ISO’s services.”

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<sup>22</sup> Design Report, p.67. Design element 21 proposes that the NWIS ISO will also:

- issue dispatch instructions in limited circumstances, including:
  - where contractual arrangements with the ISO require it – for example:
    - for ancillary service provision; and
    - for providing a dispatch service; and
  - to step in to preserve or restore system security and reliability – for example:
    - following equipment failure; and
    - to manage a network or system constraint (consistent with the NWIS Rules).

<sup>23</sup> Design Consultation Paper, p.50; Design Report, p.66.

The following sections address the extent to which these powers and responsibilities, as they relate to the design elements set-out in the Design Consultation Paper and Design Report, will be addressed under the Administrative ISO model.

## 6.2 Registration regime

Although the Design Consultation Paper and the Design Report do not address the need for, and design of, a registration regime for the NWIS, the WEM Rules<sup>24</sup> could be appropriately adapted for use in the NWIS. The design will need to be simplified to accommodate the Administrative ISO model, in which the relevant parties, and their attendant responsibilities and obligations, will be limited to the NWIS ISO and network operators (as participants).

As a governance participant, the ERA would be exempted from registration. However, the NWIS Rules will likely provide a framework for the interactions between the ERA and the NWIS ISO and participants in relation to the following matters<sup>25</sup>:

- Approve the NWIS ISO's allowable revenue and forecast capital expenditure.
- Administer rule change process for NWIS Rules.
- Compliance monitoring, reporting and enforcement.
- NWIS ISO surveillance.

AEMO will work with the PUO to ensure that a suitably designed registration regime is inserted into the NWIS Rules as part of the ongoing design workshops.

## 6.3 NWIS ISO funding - cost allocation and recovery

The Design Consultation Paper proposes that the cost of establishing and operating the NWIS ISO should be:

- Kept to a practical minimum<sup>26</sup>.
- Recovered from participants<sup>27</sup>.
- Allocated in a way that is equitable and fit-for-purpose for the NWIS<sup>28</sup>.
- Recovered via a similar process to that which applies in the WEM and NEM<sup>29</sup>.

The Design Report reiterates the above and indicates stakeholder support for the funding and cost allocation methodology to be the same as applied in the SWIS<sup>30</sup>.

While the PUO's design workshops have covered potential options for allocating the NWIS ISO's function costs for system operation and for the procurement of ancillary services, mechanisms for allocating the NWIS ISO's function costs or for cost recovery are yet to be addressed.

AEMO supports the application of a triennial allowable revenue and forecast capital expenditure process for the NWIS, as this will align with current processes under the WEM Rules and the GSI Rules<sup>31</sup>. However, given

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<sup>24</sup> The GSI Rules also provides for a registration regime that was generally modelled on the design utilised by the WEM Rules.

<sup>25</sup> Other matters are likely to be identified in the design process.

<sup>26</sup> See design element 20 in the Design Consultation Paper, p.36.

<sup>27</sup> See design elements 24 and 29 in the Design Consultation Paper, pp.51 and 58.

<sup>28</sup> The Design Consultation Paper proposes that system operator costs can be charged to loads and generators on a per-MWh basis. See Design Consultation Paper, p.56.

<sup>29</sup> The Design Consultation Paper proposes that the NWIS ISO will need to apply to the ERA for its 'Allowable Revenue and Forecast Capital Expenditure', which will incorporate its NWIS-specific costs on a triennial basis. See Design Consultation Paper, p.56.

<sup>30</sup> Design Report, p.73.

<sup>31</sup> The GSI Rules were modelled on the WEM Rules in relation to arrangements for fees and charges.

the smaller scale of the NWIS operations, other lower administrative cost options such as the budgeting arrangements applied in the NEM should also be considered. Under the Administrative ISO model, fees to recover the NWIS ISO's function costs would be allocated among participants, that is, recovered from network operators only through equitable means.

In the interests of simplicity and lowest implementation costs, allocating the NWIS ISO function costs equally among participants has merit, as achieving NWIS system security is a shared objective of all participants. AEMO supports a simplified approach to settlements for FCAS (load following, spinning reserve and balancing service) that is not based on the real-time use of the ancillary service, in accordance with the operation of the Administrative ISO model (settlements are covered in section 6.13 below).

Other services provided to network operators, such as non-scheduled runs of the system model, could be charged on a user-pays basis.

#### **Design Element 20**

The design principles for the ISO are:

1. the ISO's core function is to ensure the reliability and stability of the system;
2. the ISO should act with impartiality and transparency;
3. the ISO should act to maximise overall system efficiency;
4. the cost of establishing and operating the ISO should be kept to a practical minimum;
5. proposed arrangements should consider the commercial interests and priorities of privately-owned electricity network assets in the NWIS;
6. technical standards should not present a physical constraint to potential future interconnection of the NWIS, or a barrier to any technology type; and
7. the effectiveness of the ISO should be reviewed periodically.

#### **Design Element 24**

The ISO will at initiation provide limited Market Services, with economic dispatch of generation unlikely to be justified in the NWIS for the foreseeable future. The ISO needs to be provided with an ability to cover its NWIS-related administrative costs and the costs of any Market Services that it provides.

#### **Design Element 28**

The ISO's annual revenue and capital expenditure forecast will be independently approved by the ERA.

## **6.4 NWIS Rules**

The Design Consultation Paper notes the importance of a single, final and agreed set of technical rules that can be applied consistently across the NWIS for electricity generation, network operation and power system operation. The NWIS Rules are intended to apply to both covered and uncovered networks and will be implemented and managed by the NWIS ISO<sup>32</sup> but the rule change process for the NWIS Rules will be administered by a different entity<sup>33</sup>.

The NWIS Rules will need to cover the following matters:

- Technical requirements for network connection and access.
- Generator performance standards.

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<sup>32</sup> Design Consultation Paper, p.55; Design Report, p.62.

<sup>33</sup> Design Consultation Paper, p.33.

- Transition/grandfathering arrangements for existing facilities and exemption processes for upgraded existing facilities and new facilities.
- System operation i.e. ancillary services.
- Governance and NWIS ISO surveillance.
- Rule change process for the NWIS Rules.
- NWIS ISO cost-recovery mechanism.
- Compliance and enforcement.

A workshop led by the PUO examined the extent to which Horizon Power’s Technical Rules could form the basis of the NWIS Rules, given that the technical rules used by other NWIS networks were largely adapted from Horizon Power’s Technical Rules. The workshop confirmed a high level of alignment between the various technical rules that applied in the NWIS.

While there are also areas of inconsistency e.g. inconsistent standards for temporary over-voltage, load available for disconnection and different settings for under frequency load shedding, these inconsistencies are not irreconcilable, particularly if there is an exemption methodology.

A PUO design workshop on the NWIS Rules<sup>34</sup> established three options for network planning criteria, but a preferred option was not confirmed:

- Transfer existing network planning criteria to the NWIS Rules.
- Exclude existing network planning criteria from the NWIS Rules i.e. locate each, or all, within a separate instrument.
- Include requirement in the NWIS Rules for network operators to separately develop and publish planning criteria for their own networks.

AEMO supports an arrangement whereby existing transmission and distribution network planning criteria can be separately developed and published by each network and located in a document outside of the NWIS Rules. This is consistent with the overarching core function allocated to the NWIS ISO under the Administrative ISO model, in which the responsibility for network reliability and supply adequacy remains with network operators.

## 6.5 NWIS Rule change process

The Design Consultation Paper and the Design Report state that the ERA is best-placed to administer a rule change process for the NWIS Rules<sup>35</sup>. They also note that a technical advisory group, comprising participant representatives, could assist the NWIS ISO on technical matters<sup>36</sup>. Arguably, this assistance could extend to the assessment of rule change proposals. The PUO is yet to provide further detail on the design of the rule change process.

The function of administering the rule change process for the WEM Rules is conferred on the Rule Change Panel under the Energy Industry (Rule Change Panel) Regulations 2016. The regulations also require the ERA to provide administrative support to the Rule Change Panel. The regulations will require amendment to enable the Rule Change Panel to administer changes to the NWIS Rules. Further regulatory amendment will be required to establish any technical advisory body that may be deemed necessary to assist the Rule Change Panel in assessing rule change proposals. Potentially, a body similar to the Market Advisory Committee in the WEM could be used as a basis for this design. As it is proposed that the NWIS ISO makes recommendations

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<sup>34</sup> Public Utilities Office (2018) NWIS Reform – Technical Rules Workshop, 31 August.

<sup>35</sup> Design Consultation Paper, p.55; Design Report, p.72.

<sup>36</sup> Design Consultation Paper, p.56; Design Report, p.73.

for rule changes as part of its monitoring responsibility, the rule change process must allow the NWIS ISO and other relevant parties to propose rule changes.

The merit of a proposed change to the WEM Rules is assessed against the five defined WEM Objectives<sup>37</sup>. Where the rule change process for the NWIS Rules is modelled on that of the WEM, it is likely that an objective, or set of objectives, will need to be defined to enable the assessment of any changes to the NWIS Rules.

As an alternative rule change process option, the PUO could adapt the change process that currently exists under section 12 of the Electricity Networks Access Code 2004 (Access Code) for the SWIS Technical Rules, in which the ERA is the rule change authority. There is a prescribed consultation process for amendments that the ERA considers substantial in nature. This rule change process is not suitable for adoption in its current form. While the Access Code provides for the operation of a technical rules committee, the limited circumstances in which the committee may be established are unlikely to facilitate its ongoing advice into required rule change proposals. As already suggested above, the rule change process must allow the NWIS ISO and other parties<sup>38</sup> to propose rule changes.

The PUO has requested that AEMO assist with the detailed design of a rule change mechanism for the NWIS Rules. As this a governance matter, the PUO will lead design development and take responsibility for undertaking consultation with other stakeholders. AEMO will aim to ensure that the rule change process is fit-for-purpose, includes stakeholder input to the extent deemed appropriate, and can operate in conjunction with the Administrative ISO model, as well as being generally aligned with the rule change mechanisms proposed for the WEM and SWIS under the current electricity reform program.

### Design Element 32

Changes to the NWIS Rules will be a service provided to the ISO governing body by the ERA.

## 6.6 Dispatch and scheduling

The Design Consultation Paper and the Design Report propose that the NWIS ISO is sufficiently empowered to “implement the necessary actions through network operators, generators, and interruptible loads to maintain or restore security of supply” and to “direct the switching and dispatch of all networks, generators (including black-start facilities) and interruptible loads connected to the NWIS”<sup>39</sup>. The stated aim is to ensure as much of the NWIS is kept as stable as possible, as often as possible.

Under the Administrative ISO model, it is not intended that the NWIS ISO will perform a real-time role in system operation. This means that the NWIS ISO will not issue instructions for dispatch to generators or dispatchable loads either directly, or indirectly via a network operator, under normal (and secure) system conditions.

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<sup>37</sup> WEM Rule 1.2.1 The objectives of the market are:

- (a) to promote the economically efficient, safe and reliable production and supply of electricity and electricity related services in the South West interconnected system;
- (b) to encourage competition among generators and retailers in the South West interconnected system, including by facilitating efficient entry of new competitors;
- (c) 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;
- (d) to minimise the long-term cost of electricity supplied to customers from the South West interconnected system; and
- (e) to encourage the taking of measures to manage the amount of electricity used and when it is used.

<sup>38</sup> Other than the relevant network operator(s).

<sup>39</sup> Design Consultation Paper, p.42; Design Report, p.56.

The consensus position in the design workshops, and one that has the support of stakeholders, is that the operating states utilised by the WEM Rules should be adapted for the NWIS. Fit-for-purpose triggers will determine when and how the system moves from one state to another. The NWIS ISO will only be empowered to make a direction or issue an instruction when the system is assessed to be in a state of emergency (further detail is provided in section 6.7 below).

AEMO has proposed an arrangement whereby network and/or generator events with a high level of expectancy will be identified prior to the commencement of NWIS ISO operations and codified within a set of power system operation procedures (referred to in this document as 'contingency management protocols'). Each of these contingency management protocols will be delegated to the relevant network operator to administer as and when the event or events arise. The resolution of an event through a contingency management protocol will return the system from a 'high risk' operating state to the 'normal' operating state that prevailed prior to the event.

#### **Design Element 21** (Design Consultation Paper)

The ISO will undertake planning, scheduling and dispatch services for the NWIS interconnected network and will:

- develop and manage a full NWIS simulation model.
- have lead accountability for managing emergency response and post-incident investigations.

#### **Design Element 21** (Design Report)

The ISO will:

- undertake planning and outage scheduling;
- develop and manage a full NWIS simulation model;
- have lead accountability for managing emergency response and undertaking post-incident investigations; and
- issue dispatch instructions in limited circumstances including:
  - where contractual arrangements with the ISO require it – for example:
    - for ancillary service provision; and
    - for providing a dispatch service; and
  - to step in to preserve or restore system security and reliability – for example:
    - following equipment failure; and
    - to manage a network or system constraint (consistent with the NWIS Rules).

## 6.7 NWIS ISO emergency response

Any event that cannot be resolved with an existing protocol will trigger an 'emergency' operating state, which will be managed via a coordinated response by the NWIS ISO and the relevant network operator. A coordinated response will also arise where the Minister exercises emergency powers under the *Energy Operators (Powers) Act 1979* or under emergency provisions in other legislation.

The Design Consultation Paper and the Design Report propose that the NWIS ISO should have sufficient powers and authority to "direct network operators, network owners, generators and loads to protect the safety, security and reliability of the NWIS during system emergencies"<sup>40</sup>.

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<sup>40</sup> Design Consultation Paper, p.50; Design Report, p.65.

AEMO will continue to work with the PUO to identify the circumstances in which the NWIS ISO can direct or otherwise instruct a participant, and the mechanisms for making such a direction or instruction. Consistent with the Administrative ISO model, it is expected that any directions given by the NWIS ISO in an emergency situation will be given to network operators under the NWIS Rules. As the Administrative ISO model has little real time input, those actions are likely to be determined in conjunction with the network operator, time permitting.

#### **Design Element 21** (Design Consultation Paper)

The ISO will undertake planning, scheduling and dispatch services for the NWIS interconnected network and will:

- develop and manage a full NWIS simulation model.
- have lead accountability for managing emergency response and post-incident investigations.

#### **Design Element 21** (Design Report)

The ISO will:

- undertake planning and outage scheduling;
- develop and manage a full NWIS simulation model;
- have lead accountability for managing emergency response and undertaking post-incident investigations; and
- issue dispatch instructions in limited circumstances including:
  - where contractual arrangements with the ISO require it – for example:
    - for ancillary service provision; and
    - for providing a dispatch service; and
  - to step in to preserve or restore system security and reliability – for example:
    - following equipment failure; and
    - to manage a network or system constraint (consistent with the NWIS Rules).

## 6.8 Compliance and enforcement regime

The Design Consultation Paper and the Design Report propose that the NWIS ISO be established under enabling legislation to act independently and equitably with adequate powers and authority to<sup>41</sup>:

- Enforce the NWIS Rules with appropriate disciplinary action in the event of breaches.
- Lawfully enforce compliance with specified provisions in the NWIS Rules to ensure the security and reliability of the system.

The Design Consultation Paper and the Design Report do not provide detail on what “appropriate disciplinary action” or “lawfully enforce compliance” might mean under normal operational circumstances, particularly in the light of the Design Consultation Paper’s statement that the NWIS ISO would undertake a role similar to that performed by Horizon Power. In this context, the NWIS ISO would need access to information to recommend actions to participants such as generators, network owner/operators and loads, but would not have the power and authority to require compliance with the NWIS Rules and associated procedures.

Given that the NWIS currently operates on the basis of existing relationships and common understanding between network operators, AEMO suggests that a regime such as a civil penalty regime of the type that applies in the WEM may present a heavy-handed approach, at least initially. Feedback from participants in the design workshops was not supportive of a penalty regime.

Consequently, further work is required to identify what constitutes suitable action, and how that suitable action can be taken against a relevant party or parties who act to prevent a network operator from complying

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<sup>41</sup> Design Consultation Paper, p.32; Design Report, p.47.

with a direction from the NWIS ISO in an emergency situation (refer to section 6.18 - NWIS monitoring, reporting and surveillance).

The Design Consultation Paper proposes that the NWIS ISO or participants could contract with the ERA to provide compliance services<sup>42</sup>. It is unclear whether the ERA can be contracted to provide such services. It is more likely that the ERA will be conferred such a function under the NWIS Rules. The ERA undertakes WEM compliance functions as specified in the WEM Rules. This also enables the ERA to recover its costs for those functions<sup>43</sup>.

The PUO has requested that AEMO assist with the detailed design of a suitable and workable compliance regime for the NWIS and the supporting regulatory arrangements. As this is a governance matter, the PUO will lead design development and take responsibility for undertaking consultation with other stakeholders. AEMO will aim to ensure the compliance regime is consistent with the level of intervention proposed for the NWIS ISO under the Administrative ISO model. AEMO does not propose that the NWIS ISO has a responsibility for directly (or indirectly) imposing penalties or for undertaking enforcement actions.

It is expected that an existing body will be suitably empowered for such an undertaking. However, AEMO expects that the NWIS ISO will be required under the NWIS Rules to provide information (such as the outcomes of any investigations) to support the relevant enforcement authority, which is likely to be the ERA.

#### **Design Element 21** (Design Report)

The ISO will:

- undertake planning and outage scheduling;
- develop and manage a full NWIS simulation model;
- have lead accountability for managing emergency response and undertaking post-incident investigations; and
- issue dispatch instructions in limited circumstances including:
  - where contractual arrangements with the ISO require it – for example:
    - for ancillary service provision; and
    - for providing a dispatch service; and
  - to step in to preserve or restore system security and reliability – for example:
    - following equipment failure; and
    - to manage a network or system constraint (consistent with the NWIS Rules).

## 6.9 Post-incident investigation

The Design Consultation Paper and the Design Report note that, under current arrangements, “no one party is responsible for conducting and reporting the findings of post-incident investigations”<sup>44</sup>. Other than design element 21, there is little detail on the circumstances and manner in which the NWIS ISO might undertake this responsibility, or how this responsibility fits within the compliance regime more generally.

Under the Administrative ISO model, network and/or generator events with a high level of expectancy will be managed directly by network operators via a specified power system operation procedure. If an event

<sup>42</sup> Design Consultation Paper, p.54; Design Report, p.71.

<sup>43</sup> Section 25(f) of the *Economic Regulation Authority Act 2003* states that the ERA’s functions include functions conferred on it under any other legislation.

<sup>44</sup> Design Consultation Paper, p.30; Design Report, p.45.

triggers a high-risk operating state that is not resolved by the procedure, or not resolved in a timely manner, and the system moves to an emergency operating state, the NWIS ISO will be authorised to investigate the event and circumstances surrounding it.

AEMO supports the NWIS ISO undertaking an analysis of the power system's actual performance relative to the power system model. This will allow the power system model to be validated and/or improved to ensure its ongoing accuracy. The NWIS ISO may also review its actions and those of NWIS participants, specifically where participants are carrying out responsibilities under authorisation, and the effectiveness of procedures or processes. Placing a requirement on the NWIS ISO for post-incident analysis and review will lead to the continuous refinement and effectiveness of the operation of the power system for future incidents.

There should be sufficient scope within the NWIS ISO's authorisations to enable it to investigate any incident where it considers that there is reasonable cause to do so (e.g. an event is the most recent in a number of similar events that are occurring). The NWIS ISO should also be authorised to conduct investigations periodically, where it is satisfied that such periodic investigations are warranted e.g. as part of monitoring a participant's ongoing compliance.

The responsibilities of the NWIS ISO following its post-incident investigation are yet to be determined. They will depend on the powers and authority allocated to the NWIS ISO, the ERA and the design of the compliance and enforcement regime. The responsibilities of relevant parties need to be resolved as part of the design work on the compliance and enforcement regime. AEMO will assist the PUO with these matters.

#### **Design Element 21** (Design Report)

The ISO will:

- undertake planning and outage scheduling;
- develop and manage a full NWIS simulation model;
- have lead accountability for managing emergency response and undertaking post-incident investigations; and
- issue dispatch instructions in limited circumstances including:
  - where contractual arrangements with the ISO require it – for example:
    - for ancillary service provision; and
    - for providing a dispatch service; and
  - to step in to preserve or restore system security and reliability – for example:
    - following equipment failure; and

## 6.10 Reserve capacity

The Design Consultation Paper and the Design Report state that network operators are to remain "separately responsible for ensuring they have adequate capacity to meet forecast consumer requirements and performance standards, cognisant of planning criteria that account for planned and unplanned contingencies (outages) and generation configurations"<sup>45</sup>. However, the NWIS lacks sufficient price signals for generators and retailers (which are vertically integrated in the NWIS) to maintain adequate capacity to meet customer peak load plus a portion of reserve to address contingencies<sup>46</sup>.

The Design Report suggests that generators/retailers are commercially driven to fully utilise their capacity so that, in some time intervals, balancing energy is relied upon when there is inadequate generation. Furthermore, the bilateral contract arrangements and lack of integrated ancillary services management results

<sup>45</sup> Design Consultation Paper, p.37; Design Report, p.52.

<sup>46</sup> Design Consultation Paper, p.44; Design Report, p.59.

in a relatively large proportion of reserve capacity in the NWIS<sup>47</sup>. Consequently, it is proposed that the NWIS ISO could centrally and independently contract for, monitor compliance with, and make payments for reserve capacity in the same way as for other ancillary services. The expectation is that over time, reserve capacity on the NWIS could be reduced to a more efficient level.

Reserve capacity has been discussed in design workshops led by the PUO. Participant feedback has indicated a lack of support for any arrangement in which the NWIS ISO would plan for, and procure, some required level of installed reserve capacity. Additionally, there is no support for adapting the reserve capacity mechanism that operates under the WEM Rules for the NWIS. Participants are, however, willing to accept a requirement on the NWIS ISO to ensure that there is a sufficient reserve margin to support daily operations.

The detailed design in regard to how a “sufficient reserve margin” is to be determined and applied is yet to be finalised. AEMO will continue to work with the PUO to identify a solution that is workable under the Administrative ISO model.

### Design Element 22

The ISO will take over the role of procuring and allocating the costs associated with the following Ancillary Services: frequency control, spinning reserve, balancing & settlements, reserve capacity, and black start capability.

## 6.11 Operational planning and outage co-ordination

The Design Report proposes that the NWIS ISO be sufficiently empowered to “approve or otherwise co-ordinate planned outages to network or generation elements on all interconnected networks to mitigate material risk to system security and performance”<sup>48</sup>.

In the WEM/SWIS, market participants notify AEMO (as the system operator) of their outage plans up to three years ahead, providing justification for the outage and detail regarding outage timing and duration. Any changes must also be submitted to AEMO. The outage plan must outline any risks associated with the proposed outage and a contingency plan that would apply if the equipment needs to be brought back into service at an earlier time.

AEMO assesses outage plans in accordance with the Medium Term Projected Assessment of System Adequacy (MT PASA) operational planning processes<sup>49</sup>, which are geared towards ensuring that AEMO can meet its function to ensure that the SWIS operates in a secure and reliable manner. The assessment includes assessing compliance against specified obligations in respect of reserve capacity and the general availability of capacity.

Outages that are initially accepted by AEMO must be approved by AEMO before they proceed. AEMO undertakes final approval of outage plans within its Short Term PASA operational planning processes<sup>50</sup>. Where an outage plan is rejected, AEMO and the market participant must work together to determine an alternative time for the outage. A participant who submitted an outage plan approved by AEMO at least one

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<sup>47</sup> Design Report, p.59.

<sup>48</sup> Design Report, p.66.

<sup>49</sup> MT PASA studies are based on a three-year planning horizon and assist AEMO in setting Ancillary Service requirements over the year, outage planning for Registered Facilities, assessing the availability of Registered Facilities providing Capacity Credits and other capacity, among other functions associated with the management of power system security and reliability in the SWIS. See AEMO, *Power System Operation Procedure: Medium Term Projected Assessment of System Adequacy (MT PASA)*.

<sup>50</sup> ST PASA studies are based on a three-week planning horizon, and assist AEMO in setting Ancillary Service requirements, assessing final approval of planning outages, assessing the availability of capacity holding Capacity Credits among other functions associated with the management of power system security and reliability in the SWIS. See AEMO, *Power System Operation Procedure: Short Term Projected Assessment of System Adequacy (ST PASA)*.

year prior to commencement can apply for compensation where the outage is delayed or cancelled by AEMO within 48 hours of commencement.

NWIS participants have indicated that the processes and timeframes in which ST PASA and MT PASA assessments are made in the WEM/SWIS are unlikely to be suitable for application in the NWIS. The justification is based on the fact that operational planning in the WEM/SWIS is performed in timeframes appropriate to facilitate power system and market operation on a real-time basis, and with the support of a 24/7 security desk. Consequently, some adjustment will likely be required to ST PASA and MT PASA timeframes as applied in the NWIS under the Administrative ISO model.

The preference of participants is that a planned outage of a network element or generating unit will proceed unless the NWIS ISO determines there is an unreasonable risk to system security. The NWIS ISO will publish the planned outages plans it has received within the previous 2-year to 2-week period. A priority system based on the principle of 'first come first served' will determine which outages may proceed. In the event that the NWIS ISO has assessed there will be a conflict (or potential conflict) caused by the outage plans of two separate parties, the NWIS ISO will advise each of the two parties and require the negotiation of alternative outage plans<sup>51</sup>. Where a resolution cannot be achieved between the two parties, the NWIS ISO must be authorised to withhold approval of an outage plan (or cancel an outage plan) or reschedule an outage plan.

AEMO will continue to work with the PUO to develop a fit-for-purpose framework for operational planning and outage assessment in the NWIS.

#### **Design Element 21 (Design Report)**

The ISO will:

- undertake planning and outage scheduling;
- develop and manage a full NWIS simulation model;
- have lead accountability for managing emergency response and undertaking post-incident investigations; and
- issue dispatch instructions in limited circumstances including:
  - where contractual arrangements with the ISO require it – for example:
    - for ancillary service provision; and
    - for providing a dispatch service; and
  - to step in to preserve or restore system security and reliability – for example:
    - following equipment failure; and
    - to manage a network or system constraint (consistent with the NWIS Rules).

#### **Design Element 23**

The ISO will provide the following Network Services for the NWIS in conjunction with Network Owners, Generators, and End Customers:

- Network coordination.
- Technical oversight of connections and access.
- Publication of statements of transmission development and generation opportunities (whilst protecting commercially sensitive information).

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<sup>51</sup> A participant might submit an outage plan for a facility that is important to the security of the NWIS, in which case the outage must be taken at a specified time and cannot be easily rescheduled. However, suppose that the outage plan is submitted after another participant's outage plan for a facility that has a lesser impact on power system security, and the NWIS ISO assesses that there will likely be detriment to the power system if both plans went ahead. In that situation, the NWIS ISO will work with both participants, to reschedule the outage of the facility that has a lesser impact on power system security.

## 6.12 Ancillary services

The Design Consultation Paper and the Design Report propose that the NWIS ISO be established under enabling legislation with powers and authority to enter into contractual arrangements for the procurement of various services i.e. ancillary services and to equitably allocate costs among participants<sup>52</sup>.

The Design Consultation Paper refers to specific ancillary services that the NWIS ISO should manage on commencement of the NWIS reforms. These include frequency control, balancing and settlements, spinning reserve, reserve capacity (previously covered in section 6.10 above) and black start capability. The Design Consultation Paper and the Design Report also make some specific design recommendations in relation to ancillary services<sup>53</sup>:

- The NWIS ISO would procure FCAS on behalf of all participants based on a competitive process.
- The NWIS ISO would, through formalised requirements for procuring, funding and dispatching spinning reserve in particular, lead to cost efficiency and enhanced system security over time.
- The cost of providing and/or receiving balancing energy must be settled among generators at an agreed price.
- The costs associated with providing these services would be allocated equitably to all participants, not borne solely by Horizon Power.

The Design Consultation Paper and the Design Report state that the “requirement for ancillary services will vary in real time as the configuration of the interconnected transmission, loads (demand) and generation fleet changes”<sup>54</sup>. Consequently, the NWIS ISO would require timely information to assess the appropriate levels of ancillary services and the ability to dispatch ancillary services.

The Administrative ISO model will not operate in real-time, so there will necessarily be some departures from the recommendations made in the Design Consultation Paper on ancillary services.

Due to the plant sizing in the NWIS (40MW except for a single 55MW unit) the contracting of FCAS and the spinning reserve ancillary service is less reliant on the dynamic operation of the power system. AEMO considers that the contracts or obligations within the NWIS Rules can be written in such a manner that the ancillary services cover the full operational spectrum.

AEMO proposes that the NWIS ISO should be responsible for determining the quantities of the various ancillary services. However, these quantities cannot be sensibly determined until a dynamic system model is implemented. Consequently, the current arrangements will continue to apply in the first instance:

- Rio Tinto will continue to provide regulation FCAS for the NWIS, in recognition that Rio Tinto’s generating plant has demonstrated its ability to provide FCAS across the full spectrum of operating conditions.
- Rio Tinto, Horizon Power and Alinta Energy will continue to supply contingency frequency control ancillary services i.e. spinning reserve, for the western and eastern portions of the NWIS respectively.
- A co-ordinated approach (between the three network operators) will continue to apply for balancing.
- Voltage control and system strength are at present, and will continue to be, the responsibility of network operators; the NWIS Rules will specify the obligations on network operators for voltage control.
- Network operators have the capability and will continue to be responsible for the provision of system restart (‘black start’) ancillary services for their own networks.

AEMO proposes the following initial arrangements for the procurement of ancillary services and the allocation of costs, with some commentary on any actions necessary to finalise the design detail of the transitional arrangements.

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<sup>52</sup> Design Consultation Paper, p.32; Design Report, p.47.

<sup>53</sup> Design Consultation Paper, pp.42 and 43; Design Report, pp.57 and 58.

<sup>54</sup> Design Consultation Paper, p.42; Design Report, p.51.

### 6.12.1 Regulation FCAS / Load Following Ancillary Services (LFAS)

- The NWIS ISO will tender for FCAS from a primary provider, which will cover regulation FCAS / LFAS down and LFAS up.
- Procurement to be undertaken through a transparent mechanism on the basis of a competitive price:
  - Provider must include an availability cost and its proposed energy price.
  - The proposed energy price will need to be consistent with 'pricing principles' e.g. must include the cost of machine starts and stops rather than only marginal operating costs.
- Regulation FCAS will be provided by a network operator via a contract to the NWIS ISO:
  - A contract will require regulation FCAS to be provided within specified parameters for system frequency.
  - A contract will not place a limit on the number of machines used to deliver regulation FCAS as this will be a requirement on the network operator to determine, provided the required service level is achieved.
  - Term of contract will be 3 years (replacing the current arrangements administered by Horizon Power). A substantial change in the NWIS, whether network augmentation, load or generation, will be a condition to trigger the contract's termination.
- The NWIS ISO will perform the energy cost calculation of regulation FCAS once a month:
  - The energy cost to be calculated at the boundary connection point between two networks per each half hour interval, as these are metered points.
  - In regard of a new connection by a provider on a 'covered' network that is not the provider's own network, the cost will be calculated at the new connection point per each half hour interval.
- Cost allocation for regulation FCAS to be based on the current network and generation fleet:
  - The NWIS ISO will calculate costs and invoice costs to each relevant network, where they are the 'causer'.

#### **LFAS down**

- The quantity of LFAS down to be procured by the NWIS ISO will initially reflect the quantity used at present:
  - This quantity will be reviewed using dynamic system modelling and validation.
- FCAS down to be provided by the same primary provider under the FCAS contract.
- The tender process will include a tender for secondary providers of LFAS down, to cover instances where the primary provider becomes islanded or otherwise unable to provide the necessary services:
  - A contingency management protocol will identify any actions to be undertaken by a secondary provider or providers when the islanding situation occurs.
- A secondary provider must:
  - Demonstrate that it can provide sufficient generation to ensure that LFAS down can be supplied in addition to its contractual obligations for supply.
  - Identify an availability cost and its proposed energy price (to be based on 'pricing principles').
  - Ensure cost allocation methodology for FCAS is based on a causer-pays principle.

#### **LFAS up and Spinning Reserve**

- The quantities of LFAS up and spinning reserve to be procured by the NWIS ISO will initially reflect the present quantities used in each network at present:

- The quantities to be provided by each network will be reviewed using dynamic system modelling and validation, which may yield a static quantity to be applied year-round or seasonal quantities.
- FCAS up and a portion of spinning reserve to be provided by the same primary provider under an FCAS contract.<sup>55</sup> The balance of spinning reserve may be procured from a separate provider.
- The tender process will include a tender for secondary providers of LFAS up and spinning reserve, to cover instances where the primary provider becomes islanded:
  - A secondary provider must:
    - Demonstrate that it can provide sufficient generation to ensure that LFAS up and spinning reserve can be supplied on top of its contractual obligations for supply.
    - Identify an availability cost and its proposed energy price (to be based on ‘pricing principles’).
- Cost allocation for LFAS up and spinning reserve to be shared equally across the three existing network operators.

### 6.12.2 Load rejection ancillary services

- To be initially provided by the load following unit under the FCAS contract of the primary provider.
- The NWIS Rules to place a general requirement on network operators to minimise the load transfer across interconnections when a network element is removed from service:
  - Planned and unplanned outages of a network element will trigger a contingency management protocol(s) that will also identify a secondary provider(s) of FCAS.
- The need for load rejection services will be determined following dynamic system modelling and validation.

### 6.12.3 Supplementary ancillary services (Balancing)

- To be provided under the FCAS contract, that is, by the primary provider of regulation FCAS.
- The contract will specify a ‘variation band’ to apply per half hour interval. Consultation will be required to determine the specified parameters of the ‘variation band’.
- Cost allocation for Balancing to be based on the following principles:
  - A net ‘taker’ of energy outside the variation band will be exposed to the energy price and/or monetary penalty and allocated costs accordingly. Consultation will be required to determine the applicable penalty.
  - A net ‘giver’ of energy outside the variation band will not receive compensation.

### 6.12.4 System restart service

- The NWIS ISO to ascertain the adequacy of existing NWIS generators to provide system restart services for all potential electrical islands:
  - AEMO understands that the majority of NWIS generators are capable of providing system restart services.
- The NWIS Rules to place a requirement on network operators for system restart capability:
  - Where it is ascertained that there are insufficient system restart services, the NWIS Rules will provide a framework for the network operator to procure system restart services.

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<sup>55</sup> A portion of the spinning reserve requirement provided by the FCAS provider was discussed and agreed in the ‘NWIS Reform – Ancillary Services Workshop 2’ at the PUO on 9 August 2018.

### 6.12.5 Inertia services

- There are relatively low levels of inverter based (i.e. non-synchronous) generation in the NWIS and relatively low inertia synchronous generation types (i.e. aero-derivative units), but no known history of excessive frequency excursions. It is therefore unlikely that there will be a specific need for inertia services in the NWIS:
  - However, the need for inertia services will be determined following dynamic system modelling and validation.
- It is expected that the NWIS Rules will place an obligation on the NWIS ISO to consider, as part of its responsibility for operational planning and outage assessment, the effect on system inertia.

#### Design Element 22

The ISO will take over the role of procuring and allocating the costs associated with the following Ancillary Services: frequency control, spinning reserve, balancing & settlements, reserve capacity, and black start capability.

## 6.13 Settlements

The Design Consultation Paper and the Design Report are not prescriptive on the manner in which the NWIS ISO might undertake its responsibility for settlements.

AEMO has completed preliminary investigations into options for a fit-for-purpose settlements arrangement for the NWIS. AEMO considers that metering at the interfaces of the existing networks will supply sufficient data (quantities and time resolution) to calculate the energy flows between networks.

AEMO's preliminary investigations include identifying what changes will be required to internal systems and processes to allow AEMO to calculate the costs of providing ancillary services and invoicing participants on a periodic (quarterly) basis. Discussions with the PUO<sup>56</sup> indicate support for a role for the NWIS ISO akin to that performed previously by REMCo in regard to the 'swing service' for gas, in which REMCo calculated the amounts to be paid between participants but did not invoice or hold prudential security.

AEMO has identified that an adjustment process based on a simplified version of that which operates under the Gas Services Information arrangement will likely prove sufficient, although a fit-for-purpose process will need to be developed for any non-payment where AEMO does not hold prudential security. A potential option is to deal with non-payments via a dispute resolution process<sup>57</sup> (see section 6.19 below).

AEMO will continue to work with the PUO to finalise a settlements process that is workable under the Administrative ISO model.

#### Design Element 22

The ISO will take over the role of procuring and allocating the costs associated with the following Ancillary Services: frequency control, spinning reserve, balancing & settlements, reserve capacity, and black start capability.

## 6.14 Network services

The Design Consultation Paper and the Design Report propose that the NWIS ISO provides a limited range of network services, including network connection and access, network co-ordination and produces documents

<sup>56</sup> Public Utilities Office (2018) NWIS Reform – ISO Establishment Workshop, 9 October.

<sup>57</sup> Relevant clauses within the GSI Rules may also be suitable to adapt for this purpose.

to support a coordinated approach to network and generation planning<sup>58</sup>. As part of its network services functions the NWIS ISO will be required to<sup>59</sup>:

- Network connection and access: oversee the compliance of new connections and modifications to existing installations (loads, generators and networks) in accordance with the NWIS Rules, to help ensure the performance and security of the NWIS.
- Network co-ordination: derive and publish information on the long-term development of the transmission network, assessment of current and potential future capability and facilitate consultation with the broader market on constraints and potential energy solutions.
- Network planning: publish 'statements of opportunity' for transmission and generation development with the appropriate adherence to approved confidentiality protocols.

These services are explored in further detail in the following sections 6.14.1 and 6.14.2 below.

#### Design Element 23

The ISO will provide the following Network Services for the NWIS in conjunction with Network Owners, Generators, and End Customers: network coordination, technical oversight of connections and access, and publication of statements of transmission development and generation opportunities (whilst protecting commercially sensitive information) The suite of ISO functions will be reviewed as part of the mandatory post-implementation review to ensure the model is meeting specified objectives.

### 6.14.1 Network access, new connections and modifications

The reforms proposed for the Pilbara region in the Design Consultation Paper centre upon a light-handed access regime "to facilitate fair and reasonable access by third parties to the NWIS electricity network"<sup>60</sup>. The reform will establish a new regulatory framework for third party access to covered networks and will implement associated arrangements for a NWIS ISO to support security, manage ancillary services and facilitate network coordination and long-term planning in the region.

As part of the associated arrangements, it is proposed that a common set of NWIS Rules (containing technical rules) will be developed for application across all networks in the NWIS to support, among other things, connections to covered and uncovered networks.

To enable the NWIS ISO to effectively carry out its key function, the Design Consultation Paper proposes a role for the NWIS ISO in the connection and access process for covered and uncovered networks:

- Oversight of new connections to ensuring the NWIS Rules are consistently and appropriately applied for:
  - A new or replacement generator
  - Loads
  - New or replacement network elements.
- Approving/certifying that a new connection may proceed.
- Oversight of modifications to existing facilities and equipment.

The Design Report provides some insights on the characteristics of the proposed framework<sup>61</sup>:

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<sup>58</sup> Design Consultation Paper, p.ix and p.47; Design Report, p.4 and pp.60 - 62.

<sup>59</sup> Design Consultation Paper, p.50.

<sup>60</sup> The objective of the reform initiative is to put in place a fit-for-purpose regulatory framework that can deliver better outcomes for electricity consumers and assist in driving regional development in the Pilbara region. See Design Consultation Paper, p.vii.

<sup>61</sup> Design Report, p.3.

- Access<sup>62</sup>
  - New generators or generators with expanded capacity to obtain access on a potentially constrained basis so as not to constrain existing generators, other than to the extent they are already constrained under certain system conditions and network security levels.
- Connection<sup>63</sup>
  - Requirements for information provision of relevant facility and for system analysis to define the technical requirements for the connecting generators or load.
  - Prescription on the requirements and commercial arrangements for the relevant network to recover costs of constructing, maintaining and operating its connection assets.

The Design Consultation Paper and Design Report suggest that “processes similar to those currently prescribed in the NEM, and by Part C (Connection Applications) in Western Power’s Applications and Queuing Policy (AQP)” may be suitable to adapt for the NWIS<sup>64</sup>.

In terms of new connections or modifications to existing facilities and equipment, AEMO considers that a framework for network connection and access must include an exemption arrangement to ensure applicants are not burdened with unnecessary costs. The exemption arrangement may entail the NWIS ISO undertaking modelling studies at the applicant’s cost to determine if operating their facility or equipment to a lesser standard(s) would cause system security issues. The facility or equipment could be issued with an exemption where the NWIS ISO’s assessment finds no system security issues. Otherwise, the NWIS ISO would work with the applicant to determine an adequate plan to bring the facility or equipment up to a minimum identified level.

AEMO will continue to work with the PUO to develop a coordinated process for new connections and upgrades that is supportive of the respective responsibilities of network operators and the NWIS ISO.

#### **Design Element 10**

New generators or expanded capacity of existing generators will be allowed network access on a constrained basis, with such generators being appraised (without guarantee) of the likely extent of constraints and the options for relieving those constraints. Generators would be liable for the cost of any options they choose to relieve constraints.

#### **Design Element 12**

The networks will be responsible for managing the connection process, including specifying connection asset requirements and commercial terms for the provision of such assets.

#### **Design Element 13**

The ISO will be responsible for dealing with the ‘electricity transfer and access’ aspects of new connections and applications for expanded capacity, including the matters described in Design Element 10. The ISO will also design any changes to scheduling and dispatch resulting from constraints to new or expanded generators, in accordance with the NWIS Rules, and will accordingly manage constrained dispatch where required.

## **6.14.2 Network co-ordination and planning**

The Design Consultation Paper and the Design Report set out a framework for network access in the Pilbara region to deliver on the Government’s stated objectives of delivering efficiency in the NWIS by enabling

<sup>62</sup> Design Report, p.33.

<sup>63</sup> Design Report, p.34.

<sup>64</sup> It is suggested that an equivalent queuing and associated provisions in Part B of Western Power’s AQP will not be required as part of the connection process for the NWIS. See Design Consultation Paper, p.22; Design Report, p.34.

prudent investment, as well as greater choice for electricity consumers through the integration of renewable energy and innovative technologies.

While network operators are to remain responsible for network investment decisions, the NWIS ISO will have a role in developing publications to support the long-term development of the transmission network and the assessment of current and potential future capability<sup>65</sup>. The publications are intended to facilitate consultation with the broader market on constraints and potential energy solutions.

Consequently, the NWIS ISO is to develop two documents that “should form part of the dialogue among stakeholders”<sup>66</sup>:

- Transmission Development Plan: describes the current transmission network, areas of constraint, future capability, priority development plans and options for private investment.
- Generation Statement of Opportunity: advises developers to begin discussions with customers about their future power requirements to determine the viability of new generation projects<sup>67</sup>.

Developing these documents will require the NWIS ISO to engage with stakeholders on existing and potential constraints, and impending issues and future developments, in addition to holding the NWIS system model (as proposed by the PUO). AEMO proposes to explore with participants and the PUO, the value of developing an Integrated System Plan (ISP) for the NWIS as a single, integrated and consolidated biennial plan for application in the Pilbara region. Similar to the ISP developed by AEMO for the NEM, a NWIS ISP could include an assessment of system strength shortfall, and potentially expand to include shortfalls in other ancillary services, to support the existing and future capabilities of the NWIS. It could also include other material matters facing the NWIS over a 20-year planning horizon that were identified through consultation, including new projects planned to be in a location that could precipitate efficient expansion of the NWIS. AEMO suggests that any NWIS ISP could be published on a biennial basis, with provision being made in the NWIS Rules for an annual review where material changes in the NWIS are identified.

AEMO will continue to work with the PUO to determine the best approach to be taken by the NWIS ISO to deliver on its responsibility for network coordination and planning.

### Design Element 23

The ISO will provide the following Network Services for the NWIS in conjunction with Network Owners, Generators, and End Customers: network coordination, technical oversight of connections and access, and publication of statements of transmission development and generation opportunities (whilst protecting commercially sensitive information).

## 6.15 Grandfathering/exemption arrangements

The Design Consultation Paper and the Design Report consider grandfathering in terms of access rights i.e. whether existing generators will continue to receive unconstrained access or otherwise not be constrained to a greater extent than at the level experienced at the commencement of the third-part access regime.

The Design Report proposes that:

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<sup>65</sup> Design Consultation Paper, p.46.

<sup>66</sup> Design Consultation Paper, p.47; Design Report, p.62.

<sup>67</sup> The design proposed by the PUO sees the NWIS ISO being ideally placed to assess trends from collated load forecasts, the suitability of installed generation capacities and when Pilbara regional load growth is likely to exceed predetermined capacity margins.

- Generators connected at commencement of the scheme will be grandfathered with existing network access terms and conditions, while new generators or expanded capacity of existing generators will be allowed access on a potentially constrained basis<sup>68</sup>.
- The NWIS Rules will specify the extent to which any generators have been grandfathered at a given level of access at regime commencement (i.e. 'unconstrained' or up to a level that follows a specific load), and this will be considered by the NWIS ISO in managing any network constraint<sup>69</sup>.
- Secure and reliable dispatch must incorporate constraints imposed by the physical characteristics of the network and constraints imposed by contractual and grandfathered agreements for network access<sup>70</sup>.

The Design Consultation Paper and Design Report propose that the NWIS ISO undertakes operational planning and dispatch in real-time and performs its compliance role through direct interactions with loads, generators and networks (in accordance with the NWIS Rules<sup>71</sup>). Both of these design aspects are inconsistent with the Administrative ISO model, where the NWIS ISO does not have a real-time presence in system operation, or a direct relationship with generators or loads in terms of new and modified connections. Consequently, the NWIS ISO's role under the Administrative ISO model will be limited to providing assistance to the network operator i.e. modelling studies, and where necessary, issuing instructions directly to a network operator to ensure the compliance of connected facilities with the NWIS Rules.

With respect to the compliance of existing facilities connected to the NWIS, a PUO design workshop on the NWIS Rules<sup>72</sup> investigated four options for grandfathering existing facilities in relation to their technical capabilities. A preferred option was not confirmed. The options were:

- Grandfather all existing facilities - deem all to comply at commencement of the NWIS Rules.
- Recognise existing arrangements for incumbent facilities – NWIS Rules to provide for existing arrangements via exemptions and operating limitations.
- Recognise existing arrangements for incumbent facilities for a specified period of time – NWIS Rules will require compliance to be demonstrated after a prescribed period.
- NWIS Rules to require all facilities to demonstrate compliance at a prescribed commencement date.

AEMO is not aware of the extent to which existing asset owners possess full and complete information on the technical specifications and performance of their facilities. Further investigation is required to determine if asset owners must provide this information to enable the NWIS ISO to perform its key function, as testing of their facilities will impose costs on existing asset owners.

Where assets do not meet technical requirements under the NWIS Rules, then depending on materiality of any non-compliance, AEMO considers that transition arrangements might provide clear prescriptions on timeframes for bringing existing assets up to a level that comply with technical requirements under the NWIS Rules. Alternatively, exemption arrangements might allow the NWIS ISO to undertake modelling studies at the applicant's cost to determine if operating its facility or equipment to a lesser standard(s) would cause system security issues. The facility or equipment could be issued with an exemption where the NWIS ISO considers that there would be no system security issues. Otherwise, the NWIS ISO would work with the applicant to determine an adequate plan to bring the facility or equipment up to a minimum identified level.

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<sup>68</sup> Design Consultation Paper, p.47; Design Report, p.3.

<sup>69</sup> Design Consultation Paper, p.47; Design Report, p.37.

<sup>70</sup> Design Consultation Paper, p.47; Design Report, p.56.

<sup>71</sup> Design Consultation Paper, p.47; Design Report, p.66.

<sup>72</sup> Public Utilities Office (2018) NWIS Reform – Technical Rules Workshop, 31 August.

AEMO will continue to work with the PUO to formulate a method for managing the transition of existing

#### Design Element 9

Generators connected to the NWIS networks at the commencement of the new regime will continue to receive access that is unconstrained, or not constrained to a greater extent than at regime commencement. These grandfathered requirements will be codified in a set of 'NWIS Rules' relating to scheduling and dispatch and relating to any new connections and expansions of existing generators and loads.

#### Design Element 35

Transitioning to the new ISO will allow timelines that permit the ISO and participants to efficiently meet new

facilities.

## 6.16 Information requirements and disclosure

The Design Consultation Paper and the Design Report state that for the NWIS ISO to manage the power system in the NWIS, it needs to plan ahead to ensure the system is likely to be secure at all times<sup>73</sup>. This includes times when the system is experiencing planned and unplanned outages of generation and network elements due to contingency events, and to accommodate new connections, plant retirements and disconnections.

The Design Consultation Paper suggests that the NWIS ISO's responsibility for managing system security is to be performed in real-time, such that its effective planning for contingency response will require access to:

- A fit-for-purpose system simulation model.
- Real-time power flows in selected network elements.
- Load and energy forecasts.
- Outage plans (network and generation) of the various asset owners.

The Design Report considers that the NWIS ISO, to perform its responsibilities for planning, scheduling and dispatch, "will need reference performance criteria, information from system participants about the networks, loads, and generators, and a comprehensive, accurate, system simulation model (among other things)"<sup>74</sup>.

Participants are supportive of the NWIS ISO holding and using the 'NWIS system model' to undertake steady state and dynamic studies. This will enable the NWIS ISO to undertake contingency analysis and understand the network response to different network and loading configurations, as part of its actions to maintain system security.

As discussed above, participants are supportive of the NWIS ISO receiving outage plans to coordinate generator and network outages on the basis that outages will proceed unless the NWIS ISO determines that there is a threat to power system security.

As real-time management of the system is not a feature of the Administrative ISO model, the NWIS ISO will not be required to gather real-time information on power or to facilitate the formulation of load and energy forecasts in support of dispatch and the provision of FCAS. Further work is required to determine what and when information is required (in regard to scope, timeliness and level of granularity) by the NWIS ISO to enable it to effectively manage the operation and settlement of ancillary services to maintain power system security.

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<sup>73</sup> Design Consultation Paper, p.39; Design Report, p.54. The Design Consultation Paper makes this statement in the context of the NWIS ISO managing system security in real time, which is not a feature of the Administrative ISO Model proposed by AEMO.

<sup>74</sup> Design Consultation Paper, p.39; Design Report, p.54.

AEMO expects that, similar to the requirements under the registration regime in the WEM<sup>75</sup>, participants (network operators) who are registered in the NWIS will be required to provide specified 'standing data' on the capabilities of facilities connected to their network and to enable the development of an equipment list and record equipment limits.

It remains to be verified whether there are any legal impediments that may preclude network operators from giving the NWIS ISO specified information about their contracted parties and/or what alternative empowerments may be required.

AEMO will continue to work with the PUO and participants to identify data requirements, appropriate use of the data and the required level of confidentiality regarding the data obtained.

It is expected that the NWIS ISO will be required to create procedures specifying information required from participants, when and how participants must provide information and how participants may change or update information.

## 6.17 Information disclosure and confidentiality

Legislation to establish the NWIS ISO will confer sufficient powers and authority on the NWIS ISO to "acquire the necessary information to undertake its functions (but not to disclose commercially sensitive information)<sup>76</sup>".

The Design Consultation Paper is not prescriptive on whether commercially sensitive information is 'confidential', and how the NWIS ISO might deal with commercially sensitive or otherwise confidential information, or the circumstances in which the NWIS ISO may disclose certain types of information i.e. aggregated or depersonalised information to be used for reporting purposes.

AEMO considers that the NWIS ISO will be required to implement and observe appropriate confidentiality protocols to support its responsibilities for holding and using the 'NWIS system model', standing data and operational data. In regard to the latter, further consideration needs to be given to the type of operational data, and the level of granularity of data, that could be made publicly available to participants to assist their day-to-day operation and investment decisions.

Some participants<sup>77</sup> do not support the WEM ESOO approach (on which the proposed transmission development plan and generation statement of opportunity are based) due to the potential for the information requirements to threaten commercial positions<sup>78</sup>. The challenge is therefore to determine an approach that protects commercial interests while facilitating investment efficiency through a better coordinated approach to network and generation planning.

The detailed design of a suitable framework to apply to the NWIS ISO for information disclosure and confidentiality is a governance matter. The PUO will lead design development and take responsibility for undertaking consultation with other stakeholders.

### Design Element 14

Information disclosure requirements will be developed as part of the NWIS access framework. These will be developed in consultation with stakeholders and will specify the information that must be published by covered networks and the timetable for publication.

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<sup>75</sup> See Appendix 1: Standing Data of the WEM Rules.

<sup>76</sup> Design Consultation Paper, p.32; Design Report, p.47.

<sup>77</sup> By way of feedback to the preceding issues paper. See Public Utilities Office (2017), *Improving access to, and operation of, the Pilbara electricity network – the North West Interconnected System: Issues Paper*, 14 November.

<sup>78</sup> Design Consultation Paper, p.47; Design Report, p.62.

## 6.18 NWIS monitoring, reporting and surveillance

The Design Consultation Paper and Design Report propose that, in the NWIS, the surveillance functions are likely to include<sup>79</sup>:

- Monitoring NWIS ISO performance. It is proposed that the NWIS ISO (and its network service providers) would self-report according to a pre-determined framework.
- Monitoring aspects of participant business conduct that comes under rules (such as ancillary service usage and payments).
- Exercising disciplinary powers defined in the NWIS Rules.
- Making recommendations for rule changes.
- Investigating issues in accordance within a specified scope i.e. as mandated by the NWIS Rules.

The Design Consultation Paper and Design Report propose an arrangement whereby the ERA is contracted by the NWIS ISO to provide market surveillance services for the NWIS. The basis for this proposal is that the ERA currently undertakes SWIS market surveillance, so NWIS market surveillance would be an extension of its current activities.

AEMO considers that the NWIS ISO would be ideally placed to monitor and report<sup>80</sup> on participants' non-compliance with obligations imposed by the NWIS Rules and the ongoing costs of ancillary services. The NWIS ISO would also report (potentially to the ERA and publicly) on the findings of any investigations into emergency situations and instances where network customers prevented a participant from complying with any direction issued by the NWIS ISO.

The ERA could use all reported information in making its annual assessment of the NWIS ISO's performance, and of the effectiveness of the regulatory arrangements in the NWIS. It is expected that the ERA's market surveillance activities would inform the PUO's assessment of whether the Administrative ISO model is sufficient to support the needs of the NWIS, or whether the NWIS would benefit from further regulation i.e. progressing to the Operational ISO model or the Full ISO model.

As this a governance matter, the PUO will lead design development and take responsibility for undertaking consultation with other stakeholders on the NWIS ISO's monitoring and reporting responsibilities, and the ERA's surveillance function.

### Design Element 31

The ISO surveillance functions will be provided to the ISO governing body by the ERA.

## 6.19 Dispute resolution process

The Design Consultation Paper and Design Report set out some design features of a dispute resolution process, but they are limited to a proposed framework for third party network access<sup>81</sup>.

AEMO considers that a dispute resolution mechanism will be required to resolve (non-commercial) disagreements between participants (including the NWIS ISO) in relation to their obligations under the NWIS Rules, including non-payment for ancillary services, or otherwise in relation to any non-compliance with the NWIS Rules. If any party is dissatisfied with the outcome of the dispute resolution process, it will be free to seek recourse via legal system avenues.

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<sup>79</sup> Design Consultation Paper, p.55; Design Report, p.72.

<sup>80</sup> Quarterly, or in any case, at least annually.

<sup>81</sup> Design Report, pp.14, 27 and 40.

The WEM Rules and GSI Rules contain dispute resolution processes that may be suitable for adoption (with some modification) to apply in the NWIS.

As this is a governance matter, AEMO will continue to work with the PUO to ensure consultation with stakeholders on the dispute resolution process.

## 6.20 Metering services

The Design Report proposes that initial role of the NWIS ISO is to be a 'taker' of metered data and not a provider of metering services<sup>82</sup>. Consequently, the Administrative ISO model will not accommodate the NWIS ISO undertaking metering responsibilities beyond obtaining metering data to settle ancillary services.

### Design Element 25

With the recommended functions of the ISO in this document, the ISO will need to be regarded in the Electricity Industry (Metering) Code 2012 as the equivalent of the Independent Market Operator/AEMO for the NWIS with similar rights, obligations and responsibilities. The ISO is not initially positioned as a Metering Services provider.

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<sup>82</sup> Design Report, pp.64-65.

# 7. Stakeholder engagement

AEMO has undertaken substantial stakeholder engagement to support the development of this report reviewing the proposed NWIS ISO design, development and implementation, underpinned by a comprehensive stakeholder engagement strategy and associated activities.

## 7.1 Engagement strategy

A full stakeholder assessment and engagement plan has been developed by AEMO as part of the overall stakeholder engagement strategy for the NWIS Reform Project.

Driving the strategy are two key considerations:

1. Reform objectives of the WA State Government.
2. Operational issues and motivations of the network operators and other interested stakeholders in the Pilbara region.

To ensure a productive project environment that continues to be truly collaborative and consultative, comprehensive engagement with key operational stakeholders in the NWIS commenced early in the design and planning process, in parallel with continuing engagement with the State Government through the PUO.

This level of engagement demonstrates AEMO's commitment to finding a solution that is acceptable to all parties, meets the government's reform objectives, minimises unnecessary impacts on industry, and realises an approach to manage those operational issues referred to in Chapter 1 of this document.

That continuing level of engagement has meant stakeholders from both government and industry now have the framework implementation model of an NWIS ISO regime that not only proposes to meet the needs of all stakeholders, its design provides a platform that will enable the regulatory regime to evolve in response to industry developments into the future.

Through early and ongoing engagement, key stakeholders have played a central role in influencing the design and development of the Administrative ISO model.

Stakeholder activities included:

- Reference Group meetings: Higher level, broad project direction/progress information for stakeholder representatives to discuss and report back to their organisations.
- Working Group meetings: Focus on technical implementation of regulatory regime/NWIS ISO functions for system as a whole - identifying gaps, finding technical solutions etc.
- Individual Working Group Stakeholder meetings: One-on-one to address and evaluate individual technical issues and concerns specific to that stakeholder.
- Project meetings: General project status, planning progress, pending requirements.

- Local Government/CCI meetings: One-on-one to discuss project progress, local impacts, identify and address concerns.
- Reports, submissions, briefing notes: Formal updates, proposals, government briefings.
- Employee Project updates: Higher level, broad project direction/progress information and alignment with organisational vision/strategic objectives.

### 7.1.1 Stakeholder support

It is evident from stakeholder submissions and engagement activity that varied opinions exist on the need for, and extent of, the role of a NWIS ISO. Some parties expressed support for a minimal level of NWIS ISO intervention, preserving the status quo as much as possible i.e. 'as long as our existing contracts are grandfathered and there is no negative impact or NWIS ISO directing on our day to day operations', while others supported broader and more extensive intervention than that which was proposed i.e. 'should cover the entire Pilbara region, not just some of the NWIS'.

Following the most recent series of individual meetings with all key stakeholders, it has been accepted by all participants that the Administrative ISO model meets the relevant government objectives for NWIS reform at the least cost, incorporates an acceptable level of NWIS ISO intervention, improves transparency in the operation of the NWIS and places appropriate responsibilities on those parties best able to manage those risks.

At the time of report publication, all key stakeholders have indicated they are satisfied with the current level of planning, design and development of the Administrative ISO model and have articulated their support for its implementation.

### 7.1.2 Ongoing stakeholder engagement

Pending approval to progress with implementation of the recommended Administrative ISO model, AEMO will continue to work with the PUO to finalise model detail. This should be conducted in parallel with industry stakeholder workshops and engagement to determine operational and commercial aspects e.g. network connection and access, grandfathering of existing contracts, generator performance standards etc. which will inform the NWIS Rules.

All industry stakeholders have expressed their enthusiasm to continue to be involved and consulted as the reform process progresses and will require further detail regarding practical reform implementation.

# 8. Conclusion

The Western Australian Government's reform agenda for the NWIS is aimed at increasing efficiency of the power system, removing barriers for entry to new projects and retailers, improving the security and reliability of power supply in the region and facilitating better coordination between market participants.

A key component of this reform agenda is the establishment of an Independent System Operator (ISO) for the NWIS.

The objective is to establish an appropriately-sized NWIS ISO to enhance the integration of network and generation investment and system operation, leading to greater availability of secure and lower cost electricity services.

Following the review of the proposed ISO elements outlined by the PUO, AEMO recommends the Administrative ISO model as the optimal option for the NWIS.

The Administrative ISO model meets the core objectives for NWIS ISO establishment and ongoing operation at least cost and provides the essential platform for the strategic, structured future evolution of the NWIS, supporting economic development in the Pilbara region and prosperity for the State as a whole.

The Administrative ISO model provides a minimum set of core functions to effectively perform its key role of ensuring the secure operation of the NWIS. The model includes detailed contingency/emergency operating protocols, coupled with delegations of authority to coordinate and execute the operating protocols.

The Administrative ISO model is the only model option generally supported by key industry and government stakeholders.

AEMO recommends the implementation of the Administrative ISO model for the NWIS.

AEMO recognises the need for further development of detailed design aspects for the model, which would be undertaken through engagement with relevant stakeholders under the PUO's consultation framework.

With the relatively brief timeframe prescribed by the PUO for implementation of the NWIS ISO it may be necessary to develop transitional arrangements to enable implementation from early 2020.

Implementation of the recommended Administrative ISO model will also need to integrate with the development of the regulatory regime to facilitate fair and reasonable access by third parties to the NWIS, as part of the Western Australian Government's broader NWIS Reform objectives.