Department of Energy, Mines, Industry Regulation and Safety
Energy Policy WA
GOVERNMENT OF WESTERN AUSTRALIA

Meeting Agenda

Meeting Title:	Evolution of Pilbara Network Rules Working Group
Workstream	Workstream 1 (PNR Workstream)
Date:	24 October 2024
Time:	9:30am – 11:30am
Location:	Online, via TEAMS

Item	Item	Responsibility	Type	Duration
1	Welcome and Agenda • Conflicts of interest • Competition Law	Chair	Noting	2 min
2	Meeting Apologies and Attendance	Chair	Noting	2 min
3	Minutes of Meeting 2024_08_28. Circulated out-of-session on 16 October.	Chair	Noting	2 min
4	Action Items	Chair	Noting	4 min
5	Changes to the PNR arising from the Pilbara Energy Transition Project	EPWA	Discussion	15 min
6	PNR Workstream (a) Supply adequacy (b) Centralised balancing service (c) ISO Board composition (d) Fee allocation (e) ISO resources and budgeting (f) Essential System Services (g) ESS cost allocation (h) Long term planning (i) Enforcement options (j) Confidentiality regime	RBP	Discussion	1h 30min
7	Next steps	Chair	Noting	5 min
	Next meeting: 9:30 AM, 24 November 2024 (PNR workstream)			

Competition and Consumer Law Obligations

Members of the PAC's Evolution of the Pilbara Network Rules Working Group (**Members**) note their obligations under the *Competition and Consumer Act 2010* (**CCA**).

If a Member has a concern regarding the competition law implications of any issue being discussed at any meeting, please bring the matter to the immediate attention of the Chairperson.

Part IV of the CCA (titled "Restrictive Trade Practices") contains several prohibitions (rules) targeting anti-competitive conduct. These include:

(a) **cartel conduct**: cartel conduct is an arrangement or understanding between competitors to fix prices; restrict the supply or acquisition of goods or services by parties to the arrangement; allocate customers or territories; and or rig bids.

(b) **concerted practices**: a concerted practice can be conceived of as involving cooperation between competitors which has the purpose, effect or likely effect of substantially lessening competition, in particular, sharing Competitively Sensitive Information with competitors such as future pricing intentions and this end:

- a concerted practice, according to the ACCC, involves a lower threshold between parties than a contract arrangement or understanding; and accordingly; and
- a forum like the EPNRWG is capable being a place where such cooperation could occur.

(c) **anti-competitive contracts, arrangements understandings**: any contract, arrangement or understanding which has the purpose, effect or likely effect of substantially lessening competition.

(d) **anti-competitive conduct (market power)**: any conduct by a company with market power which has the purpose, effect or likely effect of substantially lessening competition.

(e) **collective boycotts**: where a group of competitors agree not to acquire goods or services from, or not to supply goods or services to, a business with whom the group is negotiating, unless the business accepts the terms and conditions offered by the group.

A contravention of the CCA could result in a significant fine (up to $500,000 for individuals and more than $10 million for companies). Cartel conduct may also result in criminal sanctions, including gaol terms for individuals.

Sensitive Information means and includes:

(a) commercially sensitive information belonging to a Member's organisation or business (in this document such bodies are referred to as an Industry Stakeholder); and

(b) information which, if disclosed, would breach an Industry Stakeholder's obligations of confidence to third parties, be against laws or regulations (including competition laws), would waive legal professional privilege, or cause unreasonable prejudice to the Coordinator of Energy or the State of Western Australia).

Guiding Principle – what not to discuss

In any circumstance in which Industry Stakeholders are or are likely to be in competition with one another a Member must not discuss or exchange with any of the other Members information that is not otherwise in the public domain about commercially sensitive matters, including without limitation the following:

(a) the rates or prices (including any discounts or rebates) for the goods produced or the services produced by the Industry Stakeholders that are paid by or offered to third parties;

(b) the confidential details regarding a customer or supplier of an Industry Stakeholder;

(c) any strategies employed by an Industry Stakeholder to further any business that is or is likely to be in competition with a business of another Industry Stakeholder, (including, without limitation, any strategy related to an Industry Stakeholder's approach to bilateral contracting or bidding in the energy or ancillary/essential system services markets);

(d) the prices paid or offered to be paid (including any aspects of a transaction) by an Industry Stakeholder to acquire goods or services from third parties; and

(e) the confidential particulars of a third party supplier of goods or services to an Industry Stakeholder, including any circumstances in which an Industry Stakeholder has refused to or would refuse to acquire goods or services from a third party supplier or class of third party supplier.

Compliance Procedures for Meetings

If any of the matters listed above is raised for discussion, or information is sought to be exchanged in relation to the matter, the relevant Member must object to the matter being discussed. If, despite the objection, discussion of the relevant matter continues, then the relevant Member should advise the Chairperson and cease participation in the meeting/discussion and the relevant events must be recorded in the minutes for the meeting, including the time at which the relevant Member ceased to participate.

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Agenda Item 4: Action Items

Evolution of the Pilbara Networks Rules Working Group (EPNRWG) Workstream 1 – Meeting - 2024_10_24

Shaded	Shaded action items are actions that have been completed since the last EPNRWG (WS1) meeting. Updates from last working group meeting provided for information in RED.
Unshaded	Unshaded action items are still being progressed.
Missing	Action items missing in sequence have been completed from previous meetings and subsequently removed from log.

Item	Action	Responsibility	Meeting Arising	Status
5/2024	Provide an outline to the working group of which PSSR issues are being addressed by the EPNR Review and the ISO's review of Subchapters 7.3 and 7.4 respectively.	EPWA	2024_07_29	**Open** EPWA will consult with ISO during its review and consider the review's recommendation in its Final Report.
6/2024	Share reflections and insights from recent experience connecting its Port Hedland battery and storage project.	APA	2024_07_29	**Closed** APA will discuss feedback with ISOCo and EPWA.
7/2024	Revise terminology to replace reference to 'nameplate capacity' and 'capacity procurement' to align with member feedback and better reflect the NWIS context.	EPWA	2024_08_22	**Closed** Reflected in meeting materials.

Government of **Western Australia**
Energy Policy WA

Evolution of the Pilbara Network Rules Working Group

Meeting 2024_10_24

24 October 2024

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

Meeting Protocols

- Please place your microphone on mute, unless you are asking a question or making a comment
- Please keep questions relevant to the agenda item being discussed
- If there is not a break in discussion and you would like to say something, you can ‘raise your hand’ by typing ‘question’ or ‘comment’ in the meeting chat
- Questions and comments can also be emailed to EPWA - Energy Markets energymarkets@dmirs.wa.gov.au after the meeting
- The meeting will be recorded and minutes will be taken
- Please state your name and organisation when you ask a question
- If you are having connection/bandwidth issues, you may want to disable the incoming and/or outgoing video

Meeting Agenda

Item	Item	Responsibility	Type	Duration
1	Welcome and agenda	Chair	Noting	2 min
2	Meeting apologies/attendance	Chair	Noting	2 min
3	Competition law statement	Chair	Noting	2 min
4	Action Items	EPWA	Noting	4 min
5	Alignment with the Pilbara Energy Transition Plan	EPWA	Noting	15 min
6	PNR Workstream Work Program	EPWA	Discussion	1h 30 min
	(a) Supply adequacy			15 min
	(b) Centralised balancing service			15 min
	(c) ISO Board composition			5 min
	(d) Fee allocation			10 min
	(e) ISO resources and budgeting			5 min
	(f) Essential System Services			15 min
	(g) ESS cost allocation			10 min
	(h) Long term planning			5 min
	(h) Enforcement options			5 min
	(i) Confidentiality regime			5 min
7	Next Steps			5 min

5. Alignment with the Pilbara Energy Transition Project

Recap

Through the Pilbara Industry Roundtable, EPWA is undertaking the Pilbara Energy Transition (PET) Project to enable the development of substantial common-user new-build transmission infrastructure.

Part of this project involves regulatory evolution to ensure that the current regime comprising the Pilbara Networks Access Code (PNAC) and the PNR will:

- facilitate private sector investment in new common-use transmission infrastructure
- remain fit for purpose as the number of market participants and interconnected networks grows
- otherwise promote the PET Project's objectives.

Under the PET Project, EPWA will be proposing reforms to both the PNAC and PNR.

Some of the PNR changes are already being addressed in the EPNR workstream (including some discussed above), but stakeholder engagement is identifying other areas for reform not previously discussed with this group.

More detail will be provided on these reforms over coming months.

PNAC changes being considered

Current thinking

- Third party access/ coverage
- Constrained or unconstrained access
- How access contracts are formed and managed
- How access prices will be regulated
- Wheeling energy across multiple networks
- Risk mitigation for early projects
- Managing vertical integration
- Volume risk of additional capacity

Additional PNR changes emerging from PET Project

Possible PET Project reforms to PNR not previously included in EPNR workstream

- Normalising PNR governance – While this is included in the EPNR work, it is now clear that transparent decision-making by an Independent System Operator rather than collaborative decision making by NSPs will also increase investor and other stakeholder confidence, and help with competition law compliance.
- The constrained access regime (Subchapter 9.1) will be reviewed, and measures introduced with a view to avoiding the problems associated with unconstrained access while still adequately prioritising reliability for foundation users.
- Ringfencing – New vertically-integrated NSPs will be tolerated, but closely regulated.
- CorridorCo – It is proposed there will be a State entity to secure and hold transmission corridor tenure. It will have a role in at least Chapter 10.
- Transition for early projects – Some projects arising from the current EOI process may need to commence before the reforms are in place. They will initially be ‘regulated’ by contract, and will transition into the amended PNR as reforms are implemented.
- Rename the PAC – the current name has no linkage to electricity rules, which has caused concern among non-industry stakeholders (e.g. community groups) who interpret it as something much bigger.

6. PNR Workstream Work Program

Today's issues – initial proposals for discussion

Power system security and reliability

- Reliability standard and supply adequacy
- Long term planning
- Outage planning
- ESS definitions and procurement
- ESS cost allocation
- Responsibility for setting system strength requirements

Scheduling, dispatch and settlement

- Balancing service with (optional) reduced load following requirements
- Metering obligations
- Load shedding arrangements
- Fee allocation

New connections

- NSP to NSP connection arrangements, including constrained access
- Process for new transmission build, including transmission pricing and constrained access
- Registration category and requirements for storage facilities
- Registration category and requirements for DSR
- Exemptions and derogations from the HTR

Terminology

- Registration constructs – definition of "NSP"
- Definition and use of "energisation" and "commercial operations"
- Consistency between PNR and HTR

Governance of the ISO

- Board composition
- Resourcing and budget
- Ringfencing and confidentiality regime

Compliance and enforcement

- Responsibilities and process for compliance monitoring
- Enforcement options

Context for Initial Proposals

Recap of planned process

- The remaining working group meetings in 2024 are intended to inform and develop content for the Consultation Paper.
  - A draft Consultation Paper will be presented to the PAC on 5 December 2024.
  - The Consultation Paper is expected to be published in mid-December 2024 and remain open for formal submissions until February 2025.
  - An Information Paper and Implementation Plan will be developed in Q1 2025.

Key messages on initial proposals presented today

- The initial proposals presented in the slide are draft only, and intended to provide ‘strawperson’ options to facilitate targeted WG feedback.
- The initial proposals presented are proposals for the ‘end state’ of the PNR. The timing and staging of an evolution plan will be considered during the development of the Implementation Plan in Q1 2025.

6(a) Supply adequacy

Proposed reliability standard and capacity forecasts

Reliability standard:

- PNR to require all parts of the NWIS to be planned and operated to at least n-1 standard, for a one-in-ten-year peak demand event.
- Parts of the network can be planned and operated to a higher standard, with the agreement of connected parties.

ISO forecasts (10-year horizon, repeated annually) and publishes:

- Peak demand (10% POE, 50% POE, 90% POE).
- Energy available in a low renewable output week (10% POE, 50% POE, 90% POE).
- Expected unserved energy in a one-in-ten year combination of high demand and low renewable output.
- Capacity requirement – including a reserve margin.

Participant supply adequacy targets

Participants can opt their generation and consumption out of capacity calculations if:

- They self supply without using the transmission network (i.e. generation and consumption are co-located); or
- A generation trip is automatically linked to a load trip; or
- They designate part of their consumption as opportunistic/flexible/non-firm.

Participants can self-certify their own generation if:

- the energy is to be used *within their portfolio,* and
- this supply will be *unaffected by network constraints.*

Otherwise capacity contribution must be assessed by ISO. Participants can ask ISO to certify the capacity contribution of their generation facilities under prevailing peak network conditions.

- Firm generation: maximum output supported by testing results, adjusted for peak demand conditions.
- Intermittent generation and storage: a probabilistic method based on Effective Load Carrying Capacity.

Securing capacity to meet forecast shortfall

ISO forecasts expected available capacity vs the capacity target for all years of the planning horizon.

ISO purchases additional capacity to cover any forecast shortfall 24 months out via a competitive tender process. Submissions will specify:

- A $/MW capacity price
- A $/MWh maximum energy price

Winners will be selected on the basis of the cheapest capacity price, and the ISO will pay all selected capacity at the highest winning capacity price (pay as cleared, not pay as bid).

Winning participants must offer this capacity in the balancing market as part of their energy balancing portfolio, with the energy price limited to the maximum price in the capacity submission.

The ISO will recover capacity costs from individual participants that have not procured sufficient capacity certificates to cover their individual requirements (including their contribution to the reserve margin).

6(b) Centralised balancing service

Proposed balancing market structure

The balancing market will start from the position that everyone is balancing their own energy. Each participant nominates:

- Total planned portfolio consumption from the network
- Total planned portfolio generation
- Contract positions.

Each participant's total planned consumption must match planned generation + contract position. This means that participants net position must be zero going into the balancing market.

A participant can choose to offer (on a $/MWh basis) balancing services around its net position:

- It can offer to produce more (or consume less) energy
- It can bid to consume more (or produce less) energy

ESS clearing can be integrated into the balancing market (see ESS section below).

Financial participation is optional

Participants are not obliged to offer balancing services. A participant who just wanted to manage its own output would nominate contract position, then manage its operations to maintain that position.

If a generation/consumption pair is behind the meter (intermittent load) it doesn't have to be included in either consumption or generation. If one side is, the other side must be too. Any transfer to or from the NWIS must be included.

Participants must agree the maximum quantity of potential bids and offers with the ISO in advance, identify the specific facilities that changes will come from, and the ISO must be able to instruct changes in output or consumption via automatic means.

ISO includes network capability in balancing clearing calculations. This will require using participant provided portfolio dispatch orders to spread portfolio energy across individual facilities.

Balancing finalisation and settlement

Balancing positions and prices are determined 1 hour before the beginning of a trading interval. ISO can redispatch balancing facilities between then and 10 minutes before real time. Load and generation changes after that time will be managed through ESS.

Balancing price set at the marginal clearing price (where supply curve intersects with demand curve).

Settlement prices:

- Net contract positions from before balancing @ zero price.
- Balancing market energy @ balancing price.
- Balancing redispatch @ balancing price.
- Departure from balancing outcomes @ balancing price +/- penalty factors.

Balancing market operation during energy shortfall

If there is an energy shortfall, participants will still have to provide a balanced nomination into balancing. Their consumption must match their production +/- contract position.

In this situation it is likely that there will be more bids to purchase additional energy in balancing than there is available free generation. The balancing market will allocate all available capacity, and there will be no headroom available to manage further changes before real time.

In this situation, participants will be held to their balancing positions, as for normal balancing operations. The difference is that in normal circumstances, the ISO can allow departures from balancing positions, and manage it through balancing facility redispatch or ESS.

If a participant has spare capacity that could be used to maintain the system in balance, but does not make it available for balancing, the ISO could direct them to make it available if the system is at risk.

6(c) ISO board composition

ISO board composition – Strawperson

As the role of the ISO expands, the neutrality and independence of the ISO will be better served by a more independent board. The ACCC has noted perceived conflicts of interest under the current board composition and powers.

This is straw person for discussion:

- The ISO board will have at least five members.
- All ISO directors, including the chair, must be independent of ISO members.
- The CEO of the ISO will be a board member.
- The CEO of the ISO will be appointed by the board.
- Directors will be appointed for staggered three-year terms and can be reappointed twice (for a total of three terms).
- To be appointed any new Director must meet selection criteria, including any requisite skill requirements.

Board composition changes require changes to fee allocation (see next section).

6(d) Fee allocation

Initial proposal: Gross volume based fees

A gross volume based approach applies in other markets.

If this approach is applied, fees would be determined on an annual basis.

1. Find the MWh quantity for each generation/storage/load facility at the point of its connection to the relevant network (covered or not-covered) in each trading interval in the past year (separating injection from withdrawal).
2. Find the absolute value for each data point from step 1.
3. Sum all the values from step 2
4. Find the total required dollar amount to be collected for the coming year
5. Find the under- (negative amount) or over- (positive amount) collection of fees for the previous year
6. Subtract 5 from 4, then divide by 3. This is the per-MWh fee to be applied in the following year.

In each settlement process, do steps 1 and 2 for each trading interval in the settlement period, sum for each participant, and multiply each participant quantity by the per-MWh fee from step 6 to get the fee payment for the settlement period.

6(e) ISO resources and budgeting

Proposals

Budget setting:

- ISO board sets budget
- Board is required to consult on a draft budget
- Budget is subject to review and approval by the Economic Regulation Authority

Resourcing:

- ISO to develop control desk capability (noting that in the WEM the Control Desk was moved from Western Power to AEMO)
- Align this move with timing of increased transparency of operations data between connected parties and the ISO.

6(f) Essential System Services

Initial proposals

- Rename existing services to align with other Australian markets:
  - The current “FCESS” becomes “Regulation”, and is split into Raise and Lower services
  - The current “Spinning Reserve” becomes “Contingency Reserve Raise”
- Add a Contingency Reserve Lower service for load rejection situations.
- No “minimum synchronous generation” requirement
- Studies required to consider need for inertia service or faster contingency response
- Dynamic ESS requirements set by ISO
- Locational ESS requirements set by ISO
- ISO to monitor compliance with ESS framework, which will require an accreditation framework and more information provided to ISO about facility operations.

Procurement, contacting and scheduling of ESS

ESS is currently procured on a contract basis. With a market mechanism for balancing energy, it makes sense to consider including ESS in the same mechanism, to allow efficient dispatch.

ESS could still be paid via direct contracts, or on a market basis, but either way efficient dispatch could be achieved by participants submitting available ESS quantities along with their balancing submissions.

If contracts are retained, the quantities could be pre-determined, and ESS payments made by the ISO to reflect contract amounts, plus energy settled at the balancing price.

Scheduling ESS in a market mechanism would require assuming:

- net zero portfolios going into balancing
- pre-certification of facilities to provide ESS, with Regulation provision requiring AGC capability
- available headroom quantities offered into balancing, with a flag on tranches that could be used for either energy or reserve
- pricing ESS based on the ISO-determined opportunity cost of scheduling, and paid as part of settlement.

EPWA proposes that a contract based approach to ESS is retained for now.

6(g) ESS cost allocation

Initial proposals

Regulation: Allocate costs on a portfolio variation basis, where either SCADA measurements or metered values for all of a participant's facilities are summed for each dispatch interval, and costs allocated based on the difference from balancing outcomes.

Contingency Reserve Raise: Allocate costs using runway method.

Contingency Reserve Lower: Allocate costs using runway method for loads.

Exemptions: To exclude a facility from the runway allocation, the ISO would need to be satisfied that it need not provision reserve for that facility. That means that the participant must have an automated mechanism in place to automatically shed load if the facility trips.

6(h) Long term planning

The future

The size and location of transmission, generation, and load are critical factors in maintaining system reliability as the system decarbonizes. With the expected demand and geographical growth of the Pilbara networks, including the NWIS, there is a significant uncertainty over where and when large investments will be made. Evolving the long-term planning arrangements would assist stakeholders to efficiently coordinate their efforts.

Options for discussion (two-step inquiry)

Step 1. Who is responsible for Long-term planning?

- No centralised forecast activity
- Mandatory information publication by NSPs, whether or not connected to the NWIS
- Each NSP produces and publishes an integrated plan for its own network
- Integrated ISP/WOSP, with a central party collating data and forecasting needs in a variety of futures.

Step 2. Is the plan ‘for information only’ or are parties required to implement transmission capital investment?

Proposal: ISO to prepare an integrated ISP for the NWIS, with transparent process and data (**Note.** The mechanism for delivery of the transmission investment is considered by the PET project)

6(i) Enforcement options

Potential additional compliance enforcement options

The PNR could provide for remedies of increasing severity (initial proposals in **bold**):

- **Formal warnings**
- Increased compliance attention (e.g. additional monitoring, independent compliance audit)
- Automatic monetary penalties (e.g. the modified runway method discussed earlier)
- **Referral to a ERA with escalating civil penalties for breaches of specific rules** (e.g. dispatch non-compliance, or breach of technical standards)
- **Temporary suspension from some aspects of market participation** (e.g. ability to purchase energy in balancing, exemption from ESS cost allocation)
- Temporary suspension from all market participation
- **Disconnection**

6(j) Confidentiality regime

Discussion

EPWA is seeking to increase transparency of information:

- Between NSPs/participants and the ISO
- Between the ISO and the public

Transparency measures should apply to all parties equally, so that there is a level playing field.

For example: outage plans and schedules, demand forecasts, generation schedules, balancing offers (ex-post), network connection costs.

What are the barriers and concerns to making more information and data available?

7. Next steps

Next steps

- Upcoming meetings:
  - **21 November –** PNR workstream meeting:
    - Proposals for long term planning, enforcement options, confidentiality regime, ESS definitions/procurement/cost allocation
    - NSP to NSP connections, storage registration, terminology
  - **5 December** – PAC meeting
  - **Dec - Feb** – Consultation paper
- *Do we need to consider scheduling an overflow meeting in November?*

Questions or feedback can be emailed to energymarkets@dmirs.wa.gov.au

We're working for Western Australia.

APPENDIX

Additional material for discussion items above

A.6(a) Supply adequacy

Current state

- Chapter 6 of the PNR provides for:
- the ISO to publish peak demand or a method for determining peak demand
- Exit Users to forecast their own peak demand and nominate a Demand Cap
- Generators to self-certify the capacity they provide
- Exit Users to provide generation adequacy certificates
- Exit Users to be restricted to withdrawing their Demand Cap.

The chapter is currently suspended, and no methods have been published.

The regime needs to evolve to include a supply adequacy standard to:

- include a method for determining the overall capacity requirement
- include intermittent renewables, storage, and demand side response
- account for correlation (or lack thereof) in the output of intermittent renewable generation (which is likely to require centralised capacity certification).
- allow different standards in different parts of the network
- while maintaining opt out for behind the meter activity where loss of generation is tied to load reduction.

Proposed reliability standard

PNR to require all parts of the NWIS to be planned and operated to at least n-1 standard, for a one-in-ten-year peak demand event.

Parts of the network can be planned and operated to a higher or lower standard, with the agreement of connected parties.

Proposed supply adequacy forecasting

ISO to forecast, for each of the next ten years:

- Peak demand in:
  - One-in-ten-year event
  - One-in-two-year event
  - Nine-in-ten-year event
- Weekly available generation output (based on existing and committed generation fleet) in:
  - One-in-ten-year low renewable output week
  - One-in-two-year low renewable output week
  - Nine-in-ten-year low renewable output week
- Expected unserved energy in a week with one-in-ten-year combination of high demand and low renewable output
- ISO determines and publishes the quantity of capacity (expected capacity requirement):
  - Required to meet peak demand in a one-in-ten year peak demand event
  - Required to avoid unserved energy in a one-in-ten-year low output week
  - Assuming new renewable generation has the same capacity contribution as the existing and committed renewable fleet.
  - With a reserve margin equal to expected average forced outage rate of the fleet

Proposed participant supply adequacy targets

ISO carries out long term demand forecasting for the NWIS, and optionally other parts of the Pilbara deemed relevant (e.g. potential interconnections). Connected participants can choose to provide their own forecast data to ISO for inclusion.

Participants can opt their generation and consumption out of capacity calculations if:

- They self supply without using the transmission network (i.e. generation and consumption are co-located); or
- A generation trip is automatically linked to a load trip.

ISO forecasts NWIS capacity target based on the supply adequacy standard set in the PNR (previous slide).

Participant capacity target is the lesser of:

- Their share of the system-wide capacity target – maximum of:
  - Top-down portion of system wide target (ISO sets method)
  - Bottom up portfolio target (ISO sets method). The sum of bottom up portfolio targets is likely to be greater than the system-wide capacity target.
- Nominated target. Participants can designate parts of their consumption as opportunistic/flexible/non-firm, for exclusion from firm capacity requirement.

The final system-wide capacity target is the sum of all participant targets.

ISO publishes information on potential shortfalls.

Proposed supply adequacy approach – reporting

Participants can self-certify their own generation if:

- the energy is to be used *within their portfolio,* and
- this supply will be *unaffected by network constraints.*

Otherwise capacity contribution must be assessed by ISO. Participants can ask ISO to certify the capacity contribution of their generation facilities.

- Firm generation: maximum output supported by testing results, under peak demand conditions
- Intermittent generation: a probabilistic method based on Effective Load Carrying Capacity
- Storage: a probabilistic method based on Effective Load Carrying Capacity

Participants provide information to ISO on capacity held towards meeting their individual capacity target.

Participant assessments may be below, above, or exactly meeting their individual capacity target.

Proposed supply adequacy approach – capacity shortfall

ISO forecasts expected available capacity vs the capacity target for all years of the planning horizon.

ISO procures additional capacity to cover any forecast shortfall less than 24 months out via a competitive tender process. Submissions will specify:

- A $/MW capacity price
- A $/MWh maximum energy price

Winners will be selected on the basis of the cheapest capacity price, and the ISO will pay all selected capacity at the highest winning price (pay as cleared, not pay as bid).

Winning participants must offer this capacity in the balancing market as part of their energy balancing portfolio, with the energy price limited to the maximum price in the capacity submission.

The ISO will recover capacity costs from individual participants that have not procured sufficient capacity certificates to cover their individual requirements.

Proposed supply adequacy approach – energy shortfall

If an energy shortfall is forecast:

- Participants are advised to restrict their consumption to:
  - Their balancing market position; or
  - Available energy from the capacity for which they have surrendered capacity certificates.

If a participant has spare capacity that could be used to maintain the system in balance, but does not make it available for balancing, the ISO could direct them to make it available if the system is at risk.

A.6(b) Centralised balancing service

Current state

Currently, Balancing Nominees must maintain an Imbalance as close to zero as possible within each Trading Interval, and in real time. Consumers can source energy from outside their portfolio, through direct contracting or by nomination via the settlement process.

Any mismatch between real-time supply and demand is met by ESS providers, or by ISO direction if ESS is insufficient to meet the gap. Sometimes there can be payment shortfalls or surpluses.

Proposed balancing market structure

The balancing market will start from the position that everyone is balancing their own energy. Each participant nominates:

- Total planned portfolio consumption from the network
- Total planned portfolio generation
- Contract positions

If a generation/consumption pair is behind the meter (intermittent load) it doesn't have to be included in either consumption or generation. If one side is, the other side must be too. Any transfer to or from the NWIS must be included.

Each participant's total planned consumption must match planned generation + contract position. This means that participants net position must be zero going into the balancing market.

A participant can choose to offer (on a $/MWh basis) balancing services around its net position:

- It can offer to produce more (or consume less) energy
- It can bid to consume more (or produce less) energy

ESS clearing can be integrated into the balancing market (see ESS section below).

Financial participation is optional

Participants are not obliged to offer balancing services. Each participant can decide how much flexibility to make available to others through the balancing market, while also being able to procure energy in the balancing market if energy is available elsewhere. A participant who just wanted to manage its own output wouldn't have to be involved at all. It would just nominate total planned consumption, generation, and any contracted quantities, then manage its operations to maintain a balanced position.

In order to be able to offer increments and decrements, the participants must agree the maximum quantity of potential change with the ISO in advance. Participants must identify the specific facilities that changes will come from, and the ISO must be able to instruct changes in output or consumption via automatic means. For example:

- AGC
- Curtailment of an intermittent renewable facility via SCADA
- Curtailment of load by digital instruction

Balancing market schedule

The ISO receives balancing bids and offers from participants, and regularly (say, every two hours) publishes forecast results (say for the next 48 hours).

Where necessary, participants update their generation and consumption positions, and their balancing bids and offers based on their intermittent forecasts.

Ideally, balancing results would be finalized (and the balancing price set) close to real-time (less than 1 hour before). This would allow results to continue to adjust to changing intermittent forecasts. Then, load and generation changes after that time could be managed through ESS.

If balancing results were made final earlier (up to 48 hours before), then the ISO would need to be able to redispatch balancing facilities between balancing market clearing and real time. ISO would redispatch:

- Pre-designated balancing facilities
- Selecting portfolios in merit order from the balancing results
- Using quantities in line with the tranches in the balancing bid and offer quantities
- Selecting facilities within each portfolio in the within-portfolio dispatch order provided by portfolio owners

Balancing settlement

Energy relating to participant net contract positions from before balancing will be settled at zero price, as those are off market.

Energy transacted in the balancing market will be settled at the balancing price.

Energy dispatched after balancing finalisation will be settled at the balancing price.

Energy consumption differing from balancing outcomes will be settled at the balancing price plus a penalty factor.

Undispatched energy production differences from balancing outcomes will be settled at the balancing price less a penalty factor.

Securing capacity to meet forecast shortfall

ISO forecasts expected available capacity vs the capacity target for all years of the planning horizon.

ISO purchases additional capacity to cover any forecast shortfall 24 months out via a competitive tender process. Submissions will specify:

- A $/MW capacity price
- A $/MWh maximum energy price

Winners will be selected on the basis of the cheapest capacity price, and the ISO will pay all selected capacity at the highest winning capacity price (pay as cleared, not pay as bid).

Winning participants must offer this capacity in the balancing market as part of their energy balancing portfolio, with the energy price limited to the maximum price in the capacity submission.

The ISO will recover capacity costs from individual participants that have not procured sufficient capacity certificates to cover their individual requirements (including their contribution to the reserve margin).

A.6(d) Fee allocation

Current state

The ISO, ERA, and Coordinator of Energy incur costs to administer and operate the PNR. These costs are currently divided equally between Registered NSPs regardless of their size, energy use, level of participation in settlement, or other participation metrics. No costs are allocated directly to generators or large consumers.

With the expected increase in various types of parties to connect to NWIS, the current fee allocation mechanism will no longer be appropriate and efficient.

Options for consideration

A causer pays approach is not possible. The level of market development, operation, and oversight services required cannot be readily linked to a particular metric. A beneficiary pays approach is the next best option.

Options (all relate to NWIS connected parties/volumes/transactions unless noted):

- Equal shares but with more participants. This would be onerous for small participants.
- Network element based (length of transmission lines, equipment-size-weighted element count). This would require novel and complex calculations.
- Gross volume based (sum of absolute values of individual generation and consumption). This would place more costs on those with larger portfolios.
- Net energy volume based (absolute value of sums of portfolio generation and load). This would place costs on those who are long or short generation in their portfolios.
- Market volume based (volumes net of contract quantities – ie only volumes traded through ISO settlement). This would place costs only on those transacting energy through central settlement, when all benefit from system operations and market development and oversight.
- Value based - % markup on all transactions. This would also allocate some costs to ESS providers and payers, but would be more likely to result in over- or under-recovery as market transaction values are likely to be more volatile than energy quantities.

Initial proposal: Gross volume based fees

A gross volume based approach applies in other markets.

If this approach is applied, fees would be determined on an annual basis.

1. Find the MWh quantity for each generation/storage/load facility at the point of its connection to the relevant network (covered or not-covered) in each trading interval in the past year (separating injection from withdrawal).
2. Find the absolute value for each data point from step 1.
3. Sum all the values from step 2
4. Find the total required dollar amount to be collected for the coming year
5. Find the under- (negative amount) or over- (positive amount) collection of fees for the previous year
6. Subtract 5 from 4, then divide by 3. This is the per-MWh fee to be applied in the following year.

In each settlement process, do steps 1 and 2 for each trading interval in the settlement period, sum for each participant, and multiply each participant quantity by the per-MWh fee from step 6 to get the fee payment for the settlement period.

A.6(e) ISO resources and budgeting

Current state

The ISO budget is set by the ISO board, and determines ISO resourcing.

The ISO currently operates on a resource-light model, designed to be dependent on the input and expertise of NSP members in decision-making processes. The ISO outsources control desk functions to Horizon Power which, in addition to its duty as a registered NSP that operates and maintains its own network, coordinates incidents and issues directions for the NWIS as a whole.

This means that Horizon Power staff need access to otherwise confidential information about the operations of other networks, though in some matters they are in competition.

Options - budget

Reforms must ensure suitable arrangements are reflected in the PNR to ensure that the ISO budget is prudent and efficient, and determined through an independent process.

Options:

- Maintain status quo. ISO board sets and approves budget. This is the approach used for AEMO's NEM functions.
- Independent budget review and approval, eg by the ERA. This is the approach used for AEMO's WEM functions.
- ISO board develops draft budget, then members vote to approve or reject, with a majority needed for approval. This may increase the length of the budget development cycle, and could be problematic if different member groups disagree on priorities or cost estimates.

Proposal:

- ISO board sets budget
- Board is required to consult on a draft budget
- Budget is subject to review and approval by the Economic Regulation Authority

Options - resourcing

As more renewables connect to the NWIS, real-time system operations will need to deal with more generators, more loads, and more complex decisions about operation of storage, intermittent curtailment, and other matters.

Operating a more dynamic balancing and ESS arrangements also mean that the control desk will need access to more data on facility capability and operations.

EPWA proposes that the ISO develop in-house control desk capability in order to allow more transparency between connected parties and the ISO.

A.6(f) Essential System Services

Current state

Subchapter 8.1 of the PNR deals with the specification, procurement, and enablement of the two available Essential System Services (ESS) in the Pilbara regime:

- FCESS (frequency control essential system service) – regulation service used to manage frequency fluctuations in the power system; and
- SRESS (spinning reserve essential system service) – contingency reserve that ensures adequate headroom (i.e., for a generator, the droop response capacity to help arrest a fall in frequency after a contingency) in the power system.

The FCESS have regulation raise and regulation lower components defined separately in the rule 201(b). However, they are procured as a single product with a single primary provider designated for the entire power system. In case the primary provider is not able to maintain the frequency, the ISO will identify all potential secondary providers available to the island and then utilize the lowest-cost option.

SRESS is used to cover larger contingency events. There is no load rejection reserve service to manage a significant drop in load. It is also procured via contracts with one or more SRESS providers.

The need for change

Intermittent generation volatility is expected to be the largest contingency, both upwards and downwards, on the power system. At the same time, having more intermittent generation built means significant curtailment will occur most of the time, thus the ability to support both regulation and contingency response.

At present, self-balancing means there are significant volumes of uncompensated reserve provided by automatic droop response from machines with headroom. With greater generation sharing, and fewer machines holding headroom, this would reduce.

The definition and procurement of the ESS in the PNR need to evolve to suit a future with high renewable penetration, including utilising storage and curtailed renewables and allowing more dynamic procurement to reduce costs.

This is also an opportunity to standardise terminology across Australian jurisdictions.

Services procured

Existing services are still required, but their naming is not aligned with naming in the WEM and NEM.

- Rename existing services to align with other Australian markets:
  - “FCESS” becomes “Regulation”
  - “Spinning Reserve” becomes “Contingency Reserve Raise”

Power systems elsewhere have implemented new services including:

- Contingency Reserve Lower (load rejection)
- Inertia (RoCoF Control Service in the WEM)
- Different classes of Contingency Reserve based on response speed, including Fast Frequency Response (sub-second) and Operating Reserves (30-minute response to replace used up reserves after a contingency)
- Synchronous generation

Services procured

From a review of ISO System Coordination bulletins for the year to June 2024:

- 12 events with frequency above 50Hz
- 20 events with frequency below 50Hz
- Causes:
  - Generator trip: 9
  - BESS trip: 2
  - adverse weather conditions
  - pole fire
  - distribution feeder trip
- Maximum MW of generation lost: 33 MW (generator trip)
- Maximum MW of load lost: 100 MW (Emergency Shutdown valve operated at gas delivery station)

A minimum synchronous generation requirement would bake in reliance on the existing technology paradigm, and should be avoided.

An inertia service or faster contingency response may be useful, and EPWA considers that this would require studies to understand likely RoCoF rates and ride-through capability.

A contingency lower service appears relevant.

ESS requirements

The nature of electricity demand in the Pilbara means that there is limited variation arising from the weather or the time of the day. This means that ESS requirements are relatively static.

ESS requirements are currently set annually, with the same quantity requirement applying in every hour of every day. A single value is used for the whole system, and if parts of the system are islanded, the ISO has mechanisms to require local generators to provide ESS even if not contracted.

The ISO has recently begun procuring supplementary ESS to allow different quantities of ESS to be provisioned at different times depending on the need. The need for different quantities of ESS is expected to increase in future, as solar and wind penetration increases the variability in the generation fleet being used to meet demand.

Other jurisdictions set ESS requirements dynamically. For example, Contingency Reserve Raise requirements can be defined based on the maximum supply loss possible at that time (be it a generating unit or a network element).

Similarly, other jurisdictions provide for specifying locational ESS requirements for different parts of the network. If this approach were used in the Pilbara, it could remove the need for separate management of islanded provision.

Procurement

ESS is currently procured on a contract basis. With a market mechanism for balancing energy, it makes sense to consider ESS at the same time, to allow efficient dispatch.

ESS could still be paid via direct contracts, or on a market basis, but either way efficient dispatch could be achieved by participants submitting available ESS quantities along with their balancing submissions. Doing so would require assuming:

- net zero portfolios going into balancing
- pre-certification of facilities to provide ESS, with Regulation provision requiring AGC capability
- available headroom quantities offered into balancing, with a flag on tranches that could be used for either energy or reserve

Regulation could be separated into Raise and Lower services, as is done in the NEM and WEM. This would allow more efficiency in dispatch, without precluding the same facility providing both services.

If paid via direct contracts, no additional ESS payments would be made by the ISO (except for energy settled at the balancing price). Alternatively, ESS could be priced based on the opportunity cost of scheduling, and paid as part of settlement.

Compliance and information

To effectively operate an integrated power system, the ISO needs information about facility activity. This means:

- SCADA points for facility output
- Meter data for all connection points
- Access to test reports and ability to mandate tests of connected equipment

The ISO needs to be able to review facility ESS accreditation, based on performance.

A.6(g) ESS cost allocation

Current state

The responsibility of paying the regulation costs falls upon the consumption nominator, who by default, is the network user. The amount is calculated based on the size of the difference between their maximum load and their minimum load for the entire three-year reference period.

SRESS costs are recovered from participants based on the size of their largest generation unit. This is regardless of how many units the participant has, or if the largest unit actually operated.

These arrangements are reasonable in the current context of the Pilbara regime as participants have similarly sized generation portfolios and large units run at high-capacity factors. However, in the future of more renewable generation penetration and energy transition, this will not be the case.

The “causer pays” principle

EPWA prefers causer-pays approaches for ESS cost recovery.

Participants are causers of the need for system-wide ESS if the operation of their facilities (whether consumption or generation) can result in impacts on the rest of the system.

- Causers of the need for regulation are those whose net generation or consumption varies from the scheduled quantity within a dispatch interval.
- Causers of the need for contingency reserve raise are those whose net generation can drop significantly, almost instantaneously.

If costs are allocated to those who cause the need for the service, it incentivizes everyone to reduce their need for the service, meaning less of the service needs to be procured, and the overall cost to the system goes down over time.

The current approaches are not causer pays:

- Regulation is allocated to those with a large difference between their maximum consumption and minimum consumption, even if that consumption varies predictably and the consumer sticks to its forecast.
- Contingency reserve raise is allocated based on the capacity of the largest unit in the portfolio, even if that facility does not run. This is closer to causer pays than the regulation allocation, but it is not suitable for a future with variable or dynamic ESS requirements.

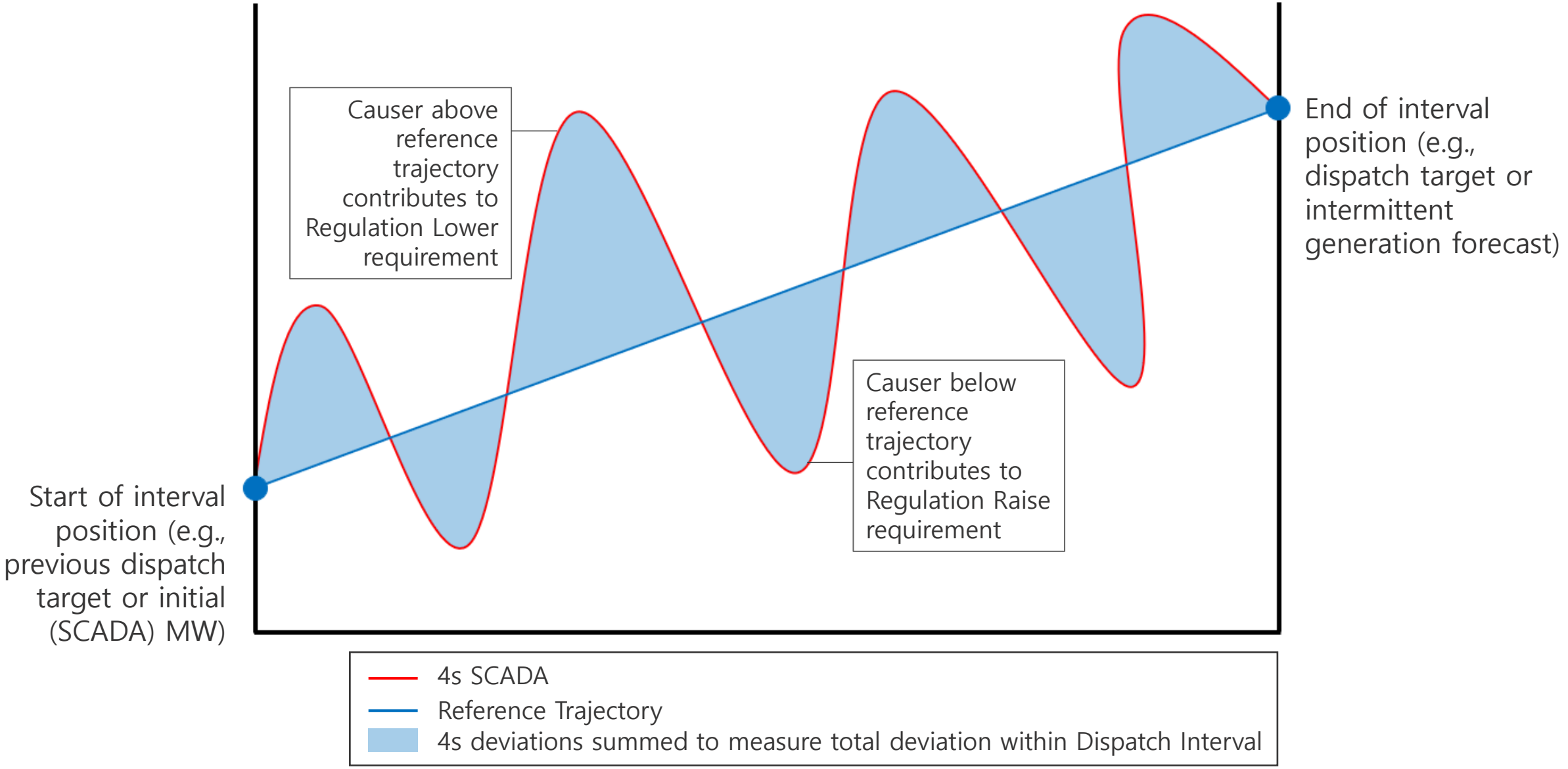
Under the current approaches, participants reducing their exposure does not necessarily translate to a reduced requirement for the services.

Regulation cost allocation

Many jurisdictions use postage stamp allocation, where costs are smeared over participants on a per MWh basis. This is simple to calculate, but is not a causer pays method. It can be a reasonable approximation if all facilities (including loads) have similar intra-interval volatility.

The NEM and WEM use real-time causer calculations. They use second-by-second SCADA data to compare the output of each generator to a theoretical perfect output trace. Regulation costs are assigned to facilities in proportion to their departure from the theoretical trajectory. See diagram on next slide for how this works.

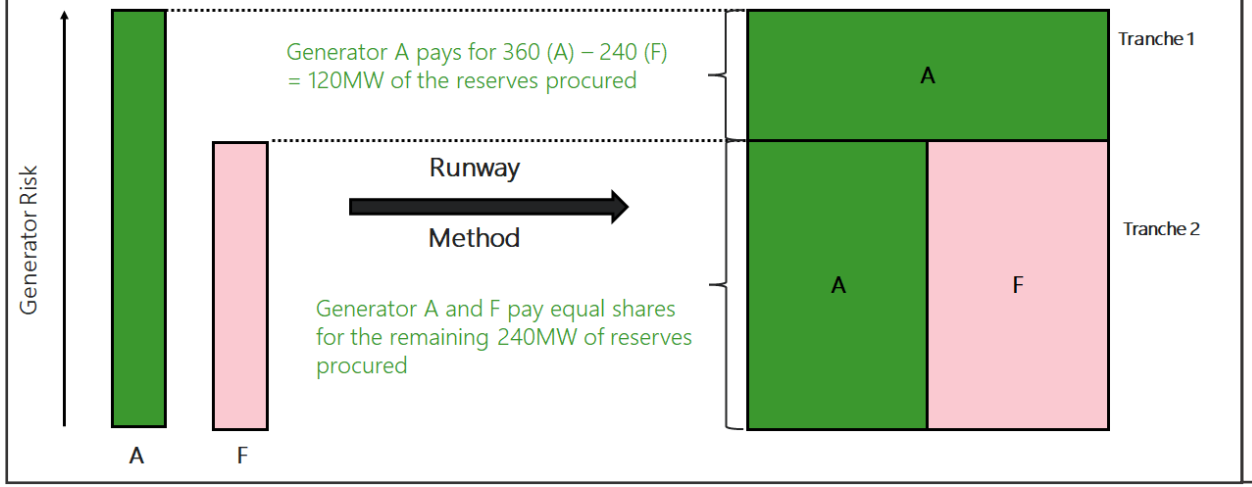
Alternatively, the portfolio nature of the Pilbara could be recognized by allocating costs on a portfolio variation basis, where either SCADA measurements or metered values for all of a participant's facilities are summed for each dispatch interval, and costs allocated based on the difference from balancing outcomes. EPWA considers that this approach would better fit the Pilbara's portfolio-based nature.


Causer above reference trajectory contributes to Regulation Lower requirement
Causer below reference trajectory contributes to Regulation Raise requirement
Start of interval position (e.g., previous dispatch target or initial (SCADA) MW)
End of interval position (e.g., dispatch target or intermittent generation forecast)
4s SCADA
Reference Trajectory
4s deviations summed to measure total deviation within Dispatch Interval

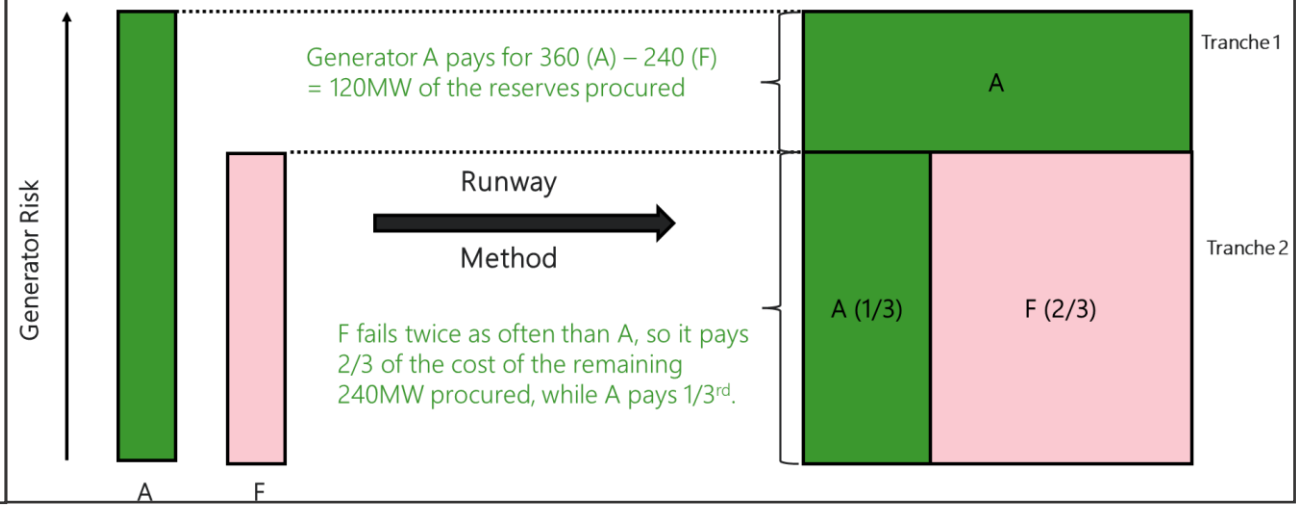
Contingency reserve raise cost allocation

The obvious approach to contingency reserve raise cost allocation is to develop the existing runway-like method into an improved runway method.

The WEM runway method is based solely on risk size.



Singapore modifies shares based on failure rates.



The Singapore approach is a step towards an event cost. This approach is used in New Zealand, where the direct costs of a specific event are allocated to the designated causer of that event.

Unless there are significant differences in facility failure rates, the vanilla runway method will probably suffice.

Exemptions from funding ESS costs

Where a participant provides its own reserve, then it need not contribute to system-wide ESS costs.

To exclude a facility from the runway allocation, the ISO would need to be satisfied that it need not provision reserve for that facility. That means that the participant must have an automated mechanism in place to automatically shed load if the facility trips.

A participant can’t be exempted from contributing to regulation costs, but could theoretically reduce its exposure to zero by accurate operation.

A.6(h). Long term planning

Current state

Every two years, the ISO is mandated by the PNR to prepare and publish two Network Coordination and Planning (NCP) reports:

- Transmission Development Plan, which describes scenarios for NWIS Covered Transmission Elements, describing the locations and quantity of supply and demand in the Networks, and a summary of the most recently published proposed and contemplated Augmentations.
- The Pilbara Generation Statement of Opportunity (GenSOO), which sets out potential investment opportunities for renewables and storage in the NWIS, the ISO's projection of generation fuel availability, fuel sources, and intermittent energy developments, a report on ESS procured, assessment of the adequacy of the system capacity, and other information set out in the Planning and Reporting Procedure.

Both reports are focused on the Covered Networks in the NWIS, but may also include information on existing, or potential new, extended or expanded, Non-Covered Networks that are not part of the NWIS. However, the ISO has limited power in seeking information from parties that are not connected to the NWIS.

EPWA is exploring transmission planning through PETA and in support of Rewiring the Nation.

The future

The size and location of transmission, generation, and load are critical factors in maintaining system reliability as the system decarbonizes. With the expected demand and geographical growth of the Pilbara networks, including the NWIS, there is a significant uncertainty over where and when large investments will be made. Evolving the long-term planning arrangements would assist stakeholders to efficiently coordinate their efforts.

Options for discussion (two-step inquiry)

Step 1. Who is responsible for Long-term planning?

- No centralised forecast activity
- Mandatory information publication by NSPs, whether or not connected to the NWIS
- Each NSP produces and publishes an integrated plan for its own network
- Integrated ISP/WOSP, with a central party collating data and forecasting needs in a variety of futures.

Step 2. Is the plan ‘for information only’ or are parties required to implement transmission capital investment?

Proposal: ISO to prepare an integrated ISP for the NWIS, with transparent process and data (**Note.** The mechanism for delivery of the transmission investment is considered by the PET project)

A.6(i) Enforcement options

Current state

The current PNR has three main mechanisms to deal with rule breaches:

- An Administered Penalty Price for Balancing Energy is calculated for Participants who fail to balance their energy beyond tolerance margins;
- Publication of rule non-compliance, and
- Disconnection.

Disconnection is not a practical remedy for most situations, many non-compliant participants will not face consequences for their actions, reducing the incentive to abide by the regulations.

Potential additional compliance enforcement options

The PNR could provide for remedies of increasing severity:

- Formal warnings
- Increased compliance attention (e.g. additional monitoring, independent compliance audit)
- Automatic monetary penalties (e.g. the modified runway method discussed earlier)
- Referral to a judicial body with escalating civil penalties for breaches of specific rules (e.g. dispatch non-compliance, or breach of technical standards)
- Temporary suspension from some aspects of market participation (e.g. ability to purchase energy in balancing, exemption from ESS cost allocation)
- Temporary suspension from all market participation

A.6(j) Confidentiality regime

Current state

Chapter 8 of the Pilbara Network Access Code (PNAC) requires NSPs to adopt and implement ringfencing rules with the main objective of ensuring that the vertical integration of NSP with any other business does not decrease competition. Ringfencing policies must emphasize confidentiality, cost allocation, and prevention of discriminatory treatment favouring the network business and other associated businesses of the NSP. This is also relevant to Horizon Power's delegated control desk functions, which must be

The PNR has confidentiality and cyber-security clauses that set out limitations on how to use, store, analyse, and disseminate confidential information, including those obtained during meetings and discussions.

Discussion

Options:

- Increase transparency of information, by requiring information publication by either NSPs or the ISO. For example: outage plans and schedules, demand forecasts, generation schedules, balancing offers (ex-post), network connection costs.
- Increase ISO visibility, by requiring NSPs to share more information with the ISO, which can then conduct better oversight of market behaviour even if the information is not published
- Make confidentiality provisions ISO centred, whereby the ISO is the main channel for confidential information.
- In-housing control desk functions would remove one confidentiality challenge