Transformation Design and Operation Working Group Meeting 36

6 May 2021

Ground rules and virtual 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 TDOWG@energy.wa.gov.au after the meeting.

- The meeting will be recorded for minute-taking purposes. Please do not make your own recording of the meeting.

- Please state your name and organisation when you ask a question to assist with meeting minutes.

- If there are multiple people dialling in through a single profile, please email TDOWG@energy.wa.gov.au with the names of the attendees to be recorded in the minutes.

- If you are having connection/bandwidth issues, you may want to disable the incoming and/or outgoing video.

Agenda

- A framework for Non-cooptimised ESS

- Forced Outage refunds and availability declarations

- Rules update

Non Co-optimised Essential System Services Framework

PROBLEM DEFINITION

Peak load

Duck curve/
Low Load

Locational issues

1950

~2010

circa 2022

FCESS Markets

✔ Frequency management

Locational security and reliability services

NCESS framework

✔ System Restart

Flexibility services
(e.g. load-ramping service; very-fast frequency response;)

*Not all circumstances can be addressed by advanced planning so emergency direction powers for AEMO continue to be necessary to maintain power system security

TYPES OF ESS IN WEM

Frequency Cooptimised ESS (market-procured; co-optimised with energy)	Non-Cooptimised ESS (procured through contracts; not co-optimised with energy)	System Restart (bilateral contracts with AEMO)
• Regulation • Contingency Reserve • RoCoF Control Service	• Voltage stability • System strength • Local network reliability • Load-ramping services • Fast frequency response	

CONTEXT FOR NCESS
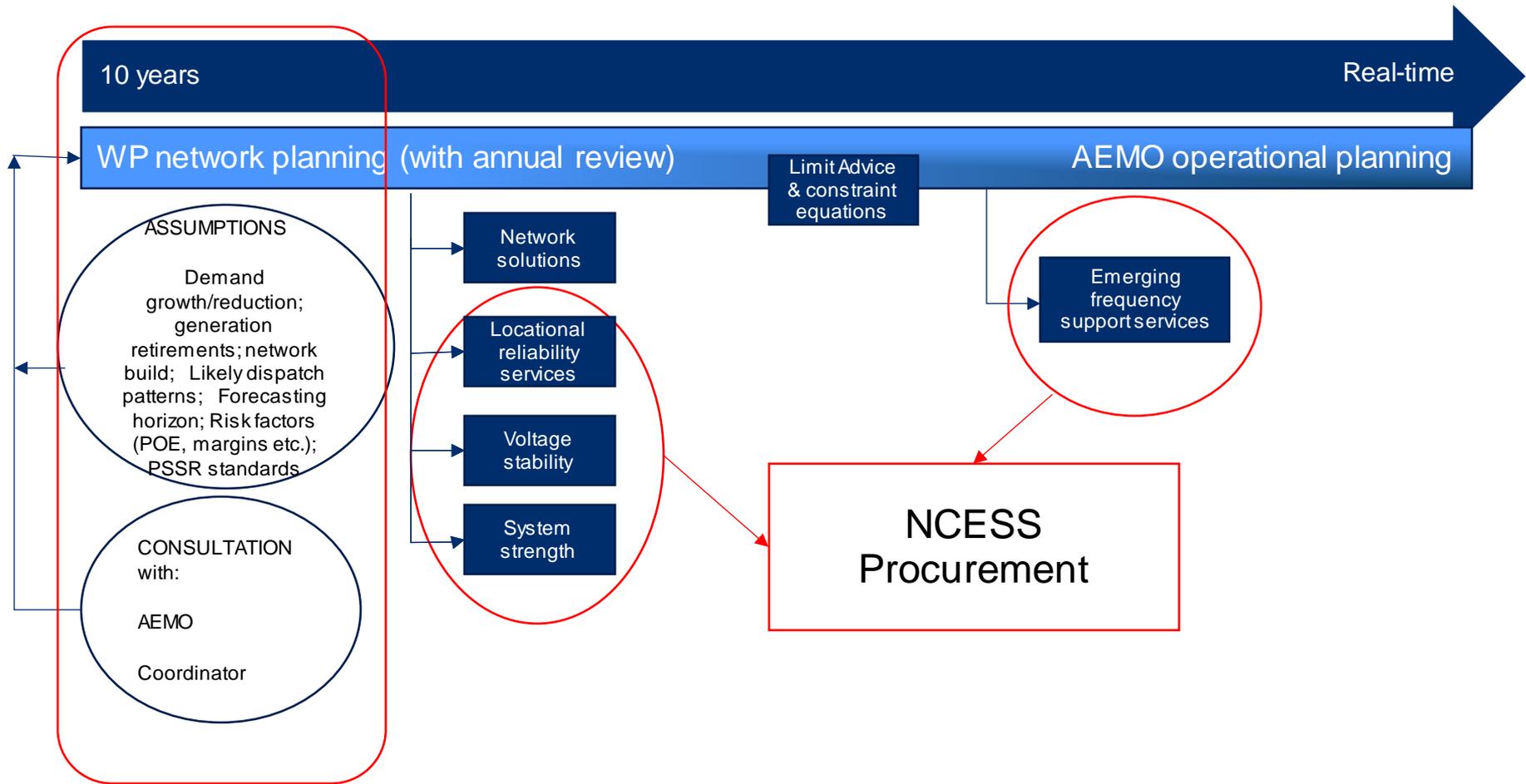
NCESS FRAMEWORK DESIGN PARAMETERS

- Triggering entity

- Reasons for Trigger

- Trigger checks

- Procurement process

- Who procures and how

- Dispatch and Settlement

- Cost recovery for NCESS

Parameters	Western Power	AEMO	Coordinator of Energy
Timeframe over which trigger can take place	Any time in the 10 years planning timeframe	Any time in operational planning timeframe	Any time
Reason for trigger	• Energy-Uplift payments in the market reach a specific threshold (i.e. network constraints are binding too often) • Planning assumptions change (e.g load is lower or higher than forecast) • Modification to PSSR standard • Frequent manual interventions to SCED to resolve VAR/non-thermal (non-frequency) constraints	• New service is forecast to be required • Modification to PSSR Standard • FCESS cost blowout (implying a new service could resolve)	• WOSP analysis • 3-yearly ESS reviews • Other state development/policy needs
Types of services	Locational security and reliability	System-wide frequency management services	Can direct WP or AEMO to procure services
Checks for the trigger	Consult with Coordinator*	Consult with Coordinator*	Consultation with Minister
Efficiency of procurement process	Justify procurement to ERA through NFIT	Analysis of trigger and selection (similar to SESSM); regular ERA compliance; market audits	NA

* Coordinator may appoint an independent expert for assurance of balancing meeting pssr requirements and economic considerations

PROCUREMENT PROCESS

Consultation with or direction from
CoE

WP procures for
locational services to be codified in the Access Code

AEMO procures for
system-wide services to be codified in the WEMR

BILATERAL CONTRACT FOR RESIDUAL SERVICES

- NCESS contract can be with existing or new facilities

- Where contracting with existing facilities, NCESS contract with WP will cover the difference between what is paid by the market for market services (including energy uplift) and the participants required revenue.

- Where contracting with new facilities, NCESS contract may cover fixed and operating costs, however it may not be sufficient to cover all costs and participants may wish to apply for CC

- Facilities applying for NCESS must declare if they have CC or are applying into RCM to receive CC.

DISPATCHING NCESS
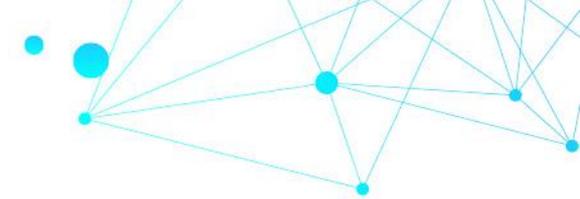
- All dispatch will be managed through constraint equations but NCESS are not co-optimised with energy

- Procedural dispatch (still advised through limit advice and reflect into SCED)

- AEMO will be engaged in how NCESS contracts procured by WP will be dispatched in accordance with the contract terms

COST RECOVERY OF NCESS CONTRACTS

- Where WP triggers, costs of NCESS are recovered through network tariffs

- Where AEMO triggers, costs of NCESS are recovered through market customers

Forced outage refunds and availability declarations

In Service/Available - Recap
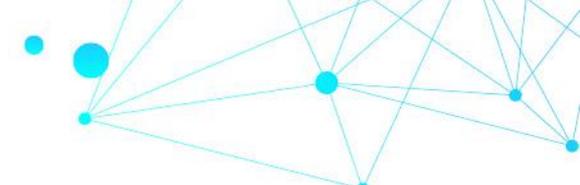
- 'in service' and 'available' quantity declarations are included in the offer structure to provide visibility of preparedness for dispatch. This ensures more likely forecasts through Pre-Dispatch, and ultimately results in feasible dispatch outcomes in realtime.

  - 'in service' quantities indicate how much of the capacity will be committed and ready for dispatch in a particular interval
  - 'available' quantities indicate how much of the capacity could be made ready for dispatch if given sufficient time

- The total of both the 'in service' and 'available' quantities should match the Remaining Available Capacity of a Facility (allowing for Outages)

- Offers also must include a minimum start-up time that indicates how long to make the 'available' capacity as 'in service'

Policy intent

Currently, if plant is unavailable this must be declared and be accompanied by either a planned or forced outage declaration, and capacity refunds will apply to the latter

All plant which is declared "available" would be subject to receiving a dispatch instruction if it is in merit. Again, there will be consequences for the Market Participant if it is unable to respond to a Dispatch Instruction.

Under the changes to the availability declarations, a declaration "Available" (but not in service) could allow a Market Participant to avoid being dispatched while still declaring it is available in its real time market submissions

- Even if it is in merit it will not be issued a dispatch instructions unless it changes its status to "In service"

To replicate the current treatment of Market Participants in like circumstances in the new WEM, capacity which was in merit but was declared "available" (but not "In service" is to be included when calculating the shortfall in the Real-Time Market for a Facility

New definition for 'Not In-Service Capacity' is used in clause 4.26.2AA.5(b)(ii), which may need some minor adjustments to deal with all cases and improve clarity:

- **Not In-Service Capacity:** The capacity in MW that was in merit and would have been dispatched by AEMO but was not dispatched only due to the capacity not being declared to be In-Service Capacity.

In Service/Available - Examples

- A Facility with a single generating unit that is not intending to commit in a particular interval would offer its full capacity as 'available'

- A multi-generator Facility intending to only run one unit would offer the capacity of the unit intending to run as 'in service' and the capacity of the remaining offline unit as 'available'

- A multi-fuel Facility that has a higher output on its alternative fuel but is intending to run on its primary fuel, would offer its full capacity on its primary fuel as 'in service' with the remaining quantity on it's alterative fuel as 'available'

- A Standalone Storage Facility would offer its full export capacity as 'in service', as the ESR itself does not need to commit

- A windfarm Facility would offer its expected forecast quantity as 'in service' to represent what is anticipated to be ready for dispatch

Simple Scenario 1 – Facility commits

- Facility: 100MW max capacity, 90MW CC, no Outage, 24 hour start-up time

t=-7 days (RTM commence)

Participant submits the Facility in the submissions

Obliged to offer to match expectations of available capacity - compliance only at this point

Shows 0MW 'in service' and 100MW 'available'

(i.e. is available to run, but not intending to commit)

t=-5 days (Market Schedule)

Market Schedule indicates to be dispatched for 50MW Reference Scenario

t=-2 days (STEM)

Pre-Dispatch indicates be dispatched for 50MW Reference Scenario

Participant submits STEM (obliged to)

May adjust its STEM quantities in Pre-Dispatch Scenario

STEM Nett Offer Shortfall calc intended pick up differences between actual STEM offers and 90MW for this Facility. In this case the quantity would be 0

t=-1 day (Pre-Dispatch)

Pre-Dispatch indicates be dispatched for 50MW Reference Scenario

Participant submits offers service' and 50MW as Facility

(i.e. is showing intent)

Dispatch Interval

Obliged to

Participant maintains offers for 50MW 'in service' and 50MW as 'available' for the Facility

Participant dispatched for 50MW, and provides 50MW

Realtime Nett Offer Shortfall calc intended to pick up differences between total RTM offers ('in service' + 'available') and 90MW. In this case the quantity would be 0

T=+5 weeks (Settlement)

STEM and RTM settlement

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Simple Scenario 2 – Facility does not commit

- Facility: 100MW max capacity, 90MW CC, no Outage, 24 hour start-up time

t=-7 days (RTM commence)

Participant submit the Facility in the submissions

Obliged to offer to available capacity this point

Shows 0MW 'in s 'available'

(i.e. is available to run, but not intending to commit)

t=-5 days (Market Schedule

Market Schedule indicates to be dispatched for 50MW Reference Scenario

Participant adjusts offers w trading boundaries

Subsequent Market Sched indicate no forecast dispatch for the Facility

t=-2 days (STEM

Pre-Dispatch indic to be required for Reference Scenar

Participant submits STEM (obliged to

May adjust its STE quantities in Pre-D Scenario

STEM Nett Offer S pick up differences offers and 90MW case the quantity would be 0

t=-1 day (Pre-Dispat

Pre-Dispatch still inc likely to be dispatche Reference Scenario

Participant maintains service' and 100MW Facility

(i.e. is not intending

Beyond this interval, longer dispatch this Facility is inside of it time

Dispatch Inte

Obliged to of

Participant maintains offers for 0MW 'in service' and 100MW as 'available' for the Facility

Participant dispatched for 0MW

Realtime Nett Offer Shortfall calc intended to pick up differences between total RTM offers ('in service' + 'available') and 90MW. In this case the quantity would be 0

T=+5 weeks (Settlement)

STEM and RTM settlement

Refund Scenario 1 – Facility does not commit, and faces refunds

- Facility: 100MW max capacity, 90MW CC, no Outage, 24 hour start-up time

Timeline markers: t-7 days | t-5 days | t-2 days | t-1.5 days | t-1 day | Dispatch Interval (t)

t=-7 days (RTM offers commence)

Participant submits the Facility in the submissions

Obliged to offer to available capacity at this point

Shows 0MW 'in service', 'available'

(i.e. is available to run, but not intending to commit)

t=-5 days (Market Schedule)

Market Schedule indicates to be dispatched for 50MW Reference Scenario

Participant adjusts offers within trading boundaries

Subsequent Market Schedule indicate forecast dispatch the Facility

t=-2 days

Pre-Disp be dispat to be disp Reference Reference

Participa Participa STEM (o service' a Facility

May adju quantitie Scenario

STEM Nett Offer Sh pick up differences offers and 90MW fo case the quantity woul

t=-1.5 days

Pre-Dispa to be disp to Referenc R

Participa P service' a s Facility F

(i.e. is no (i

A d Interval indicate quantity, and the to that quantity, actual 'in service 'in service' offer Dispatch Interval shortfall and will attract refunds

t=-23.5 hours (N

Participant main service' and 100 Facility

Pre-Dispatch no Facility is likely 50MW in the Re are inside of the up time

However, as the Interval indicated quantity, and the to that quantity, actual 'in service 'in service' offer Dispatch Interval will be declared a shortfall and will attract refunds

Dispatch Inte

Obliged to of

Participant m service' and 100MW as 'available' for the Facility

Participant dispatched for 0MW

Realtime Nett Offer Shortfall calc intended to pick up differences between total RTM offers ('in service' + 'available') and 90MW. In this case the quantity would be 0

But refunds flagged from previous Pre-Dispatch data

T=+5 weeks (Settlement)

STEM and RTM settlement

Refunds processed

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Refund Scenario 2 – Facility does not respond to direction, faces refunds

- Facility: 100MW max capacity, 90MW CC, no Outage, 24 hour start-up time

t-1.3 days

t-7 days   t-5 days   t-2 days   t-1.5 days   t-1 day   Dispatch Interval (t)

t=-7 days (RTM of commence)

Participant submit the Facility in the submissions

Obliged to offer to available capacity this point

Shows 0MW 'in se 'available'

(i.e. is available to run, but not intending to commit)

t=-5 days (Market Schedul

Market Schedule indicates to be dispatched for 50MW Reference Scenario

Participant adjusts offers trading boundaries

Subsequent Market Sched indicate forecast dispatch the Facility

t=-2 days

Pre-Disp be dispat to b Referenc Ref

Participa STEM (c Fac

May adju quantitie Scenario

STEM N sho pick up o inte offers an iden case the time

t=-1

Pre- dispa to disp Ref

PAS disp serv the serv

(i.e.

PAS sho inte idenr time

t=-1 day (Pre-Dispa

Pre-Dispatch still in to be dispatched fo Reference Scenario

Participant maintain service' and 50MW Facility as directed

Participant adjusts offers 50MW as 'available' for

(i.e. is now intending to

If the Participant fails to service', any difference quantity offered for inter will attract refunds

Dispatch Inte

Obliged to of

Participant m service' and Facility

Participant dispatched for 50MW

Realtime Nett Offer Shortfall calc intended to pick up differences between total RTM offers ('in service' + 'available') and 90MW. In this case the quantity would be 0

Any as-directed shortfall refunds flagged from previous Pre-Dispatch data

T=+5 weeks (Settlement)

STEM and RTM settlement

Any as-directed shortfall refunds processed

Policy intent – Issue 2

Clause 7.5.9 relates to the requirements for AEMO to include Constraint Equations that involve Electric Storage Resources in the Dispatch Algorithm (for example, if ESR is constrained by its current level of charge)

Electric Storage Constraints will allow more efficient use of storage resources by including the relevant constraints in the Dispatch Algorithm, instead of requiring the relevant Market Participants to frequently adjust their Real-Time Market Offers for their storage resources

There is a risk that Storage Constraints could allow Facilities to meet their offer obligations in the RCM while unable to meet their offered quantities

Storage may avoid refunds during its RCOQ intervals if this is applied without checks and balances

Storage Scenario 1 – Standalone ESR (5PM Dispatch Interval)

- Facility: 50MW max export capacity, 200MWh max storage capacity, no Outage, 50MW CC between 4PM and 8PM

t-7 days   t-5 days   t-2 days   t-1 day   Dispatch Interval (t)

t=-7 days (RTM of commence)

Participant submit the Facility in the submissions, inclu Regulation Raise

Obliged to offer to match expectati available capacity - compliance onl this point

Shows 50MW 'in service' and 0MW 'available'

(i.e. is intending to be fully available export)

t=-5 days (Market Schedu

Market Schedu to be dispatche cleared for 20M based on Refer

t=-2 days (STEM of

t=-1 day (Pre-Dispatch)

Participant re Outage for th

T=+5 weeks (Settlement)

STEM and RTM settlement

Any realtime shortfall or forced outage refunds processed

Dispatch Interval t (5PM)

Realtime state of charge = 2MWh

Maximum 5-min MW quantity for this state of charge is 24MW

Obliged to offer based on RCOQ. Participants offers still show 50MW 'in service'

But in this case, the Facility can now only physically provide 24MW.

Participant has an opt-in energy constraint and is dispatched for 24MW to ensure feasible dispatch

Realtime Nett Offer Shortfall calc intended to pick up differences between total RTM offers ('in service' + 'available') and 50MW. In this case the quantity would be 0

But the Participant has RCOQ of 50MW due to the time of the dispatch interval

Therefore refunds will apply based on the difference between RCOQ and Realtime State of Charge / 0.08333 (available 5-min dispatch quantity)

Storage Scenario 2 – Hybrid with ESR (5PM Dispatch Interval)

- Facility: 100MW max sent-out capacity, 80MW wind, 50MW ESR, 200MWh max storage capacity, no Outage, 50MW CC between 4PM and 8PM

t-7 days	t-5 days	t-2 days	t-1 day	Dispatch Interval (t)

Participant submit... service' in the wee... indicate forecast ... showing as 'availa...

(obliged to offer to match expectations... unconstrained export capability)

t=-5 days (Market Schedu...

Market Schedule in... to be dispatched fo... based on Referenc...

t=-2 days (STEM o...

t=-1 day (Pre-Dispatch)

Participant re... Outage for th... Component w...

T=+5 weeks (Settlement)

STEM and RTM settlement

Any realtime shortfall or forced outage refunds processed

Dispatch Interval t (5PM)

Realtime state of charge = 2MWh

Maximum 5-min MW quantity for this state of charge is 24MW

Obliged to offer based on RCOQ. Participants offers still show 50MW 'in service' (as the windfarm component is still forecast to export this)

But in this case, the Facility can now only physically provide 24MW.

Facility is dispatched for 'up to' 50MW (Semi-Scheduled Facility with a Dispatch Cap)

Realtime Nett Offer Shortfall calc intended to pick up differences between total RTM offers ('in service' + 'available') and 50MW. In this case the quantity would be 0

But the Participant has RCOQ of 50MW for the Separately Certified Component due to the time of the dispatch interval

Therefore refunds will apply based on the difference between RCOQ and Realtime State of Charge / 0.08333 (available 5-min dispatch quantity)

Joint Industry Plan
Rule Drafting Timeline

Work package	March	April	May	June	July	August
TRANCHE 0 - GAZETTED • Governance of constraints • Technical Rules change management, etc						
TRANCHE 1 - GAZETTED • Generator Performance Standards Framework • Frequency Operating Standards and Contingency Events Frameworks						
TRANCHE 2 - GAZETTED • Foundation Market Parameters (incl. STEM) • Frequency Co-optimised ESS • Scheduling and Dispatch • Market Settlement, etc						
TRANCHE 3 - GAZETTED • Reserve Capacity Mechanism (RCM) Prioritisation and Network Access Quantities Framework • Participation of storage/hybrid facilities in the RCM, etc						
TRANCHE 4A (now) • Transitional Arrangements (e.g. ESS accreditation) • Changes and Rules commencement to facilitate 2021 RCM, etc.	▨	▨	▨			
TRANCHE 4B (July/August) • UFLS & System Restart • Remaining changes to facilitate 2021 RCM • Changes and Rules commencement to facilitate 2022 RCM				▨	▨	▨
TRANCHE 5 (December) • Non-Cooptimised ESS Framework • Market Information Framework • Market Power Mitigation • Reliability Standards Framework • Participation and Registration framework • Intermittent Loads						

Drafting instructions and rule drafting	Stakeholder consultation	Ministerial approval, publication of the Amending Rules and Gazettal

Forthcoming commencement

- Several rules commencing on 1 July 2021:
  - Sectoral governance changes
  - Amendments to RCM and transitional registration for 2021 RCC
  - FCESS accreditation and RoCoF Ride-through capability
  - Operating protocol between WP and AEMO

Meeting close

Questions or feedback can be emailed to TDOWG@energy.wa.gov.au