28 June 2021

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Ms Anna Collyer
Chair
Australian Energy Market Commission
Sydney South NSW 1235

By online submission

Dear Ms. Collyer

Rule change proposal: Redeveloping short term PASA (ST PASA) to more efficiently manage aspects of the National Electricity Market (NEM) transition

To more efficiently and cost-effectively enable functions currently performed through ST PASA as the transformation of the NEM accelerates, AEMO requests the AEMC consider the attached proposal to amend the National Electricity Rules (NER).

The proposed rule amends clause 3.7.3 of the NER and relevant definitions to support the replacement of the current ST PASA to produce information over a seven day forecasting horizon. It proposes a principles-based approach to the requirements in NER clause 3.7.3, removing unnecessary prescription and non-essential detail from the NER and placing it in procedures that will be consulted on with market participants. This approach will allow AEMO and market participants the flexibility to respond to future ST PASA modelling changes more quickly and with less cost involved. The PASA availability recall period will be specified in the Reliability Standard Implementation Guidelines instead of the NER.

The proposed rule places a new requirement on AEMO to publish individual unit available capacity and PASA availability to improve the transparency of information available to network service providers and market participants to make operational and market decisions about the capacity they can provide at certain times. AEMO requests the AEMC to test whether it is appropriate for this information to be published in the ST PASA time frame.

Should you wish to discuss any of the matters raised in this submission, please contact Kevin Ly, Group Manager Regulation on kevin.ly@aemo.com.au.

Yours sincerely

Tony Chappel

Chief External Affairs Officer

Attachment: Electricity rule change proposal – Redeveloping short term PASA for the NEM transition

ELECTRICITY RULE CHANGE PROPOSAL

REDEVELOPING SHORT TERM PASA FOR THE NEM TRANSITION

June 2021

CONTENTS

1. SUMMARY

AEMO operates the short term (ST) projected assessment of system adequacy (PASA) and pre-dispatch (PD) PASA processes (in this document these are referred to together as the 'current ST PASA') to publish forecasts of electricity generation and network capacity available to meet the forecast electricity demand, and to indicate potential power system security or reliability of supply issues over the next seven days.

The current ST PASA was originally designed to forecast thermal generating units using a regional model. Despite significant adaptations over the years, in particular to include forecasts for wind and solar generation, the current ST PASA has material limitations that need to be addressed for the current and future NEM.

As the NEM continues to transition to more renewable technologies, energy storage and demand side participation, and sees the retirement of 'traditional' generating systems, AEMO and stakeholders have identified a need to replace the current ST PASA in order to meet existing and future NEM needs. A redeveloped ST PASA process will deliver more reliable and useful forecasts for relevant decision-making by market participants and AEMO.

ST PASA informs AEMO decisions including lack of reserve (LOR) declarations, the exercise of the reliability and emergency reserve trader (RERT) or other market interventions, e.g. outage recall and load shedding. Market participants use ST PASA forecasts to inform their decisions to make more capacity available to the market. As the NEM continues to transition, including towards a future with greater diversity on the supply and demand side, ST PASA needs to adapt to adequately account for energy storage, variable renewable energy (VRE) resources, wholesale demand response, and, into the future, increasing changes in distributed energy resources (DER).

The proposed rule seeks amendments to clause 3.7.3 of the NER to support the replacement of the current ST PASA to produce information over a seven day forecasting horizon. It proposes a principles-based approach to the requirements in NER clause 3.7.3, removing unnecessary prescription and non-essential detail from the NER and placing it in procedures that will be consulted on with market participants. This approach will allow AEMO and market participants the flexibility to respond to future ST PASA modelling changes more quickly and efficiently, including with less cost involved.

The proposed rule would also require AEMO to publish individual unit available capacity and PASA availability to improve the transparency of information available to network service providers (NSPs) and market participants to make operational and market decisions about the capacity they can provide at certain times.

2. RELEVANT BACKGROUND

2.1 Current NEM arrangements

AEMO is required to monitor the operation of the power system and maintain power system security in accordance with the NER power system security principles and responsibilities[1]. AEMO's first priority is to maintain the power system in a secure operating state[2], which occurs if the power system is in a satisfactory operating state[3] and if it will return to a satisfactory operating state following a credible contingency event[4]. AEMO's central dispatch process determines a 'security constrained dispatch' for all dispatchable resources, taking into account market ancillary service requirements needed to remain in a

[1] NER clauses 4.2.6 and 4.3.1.
[2] NER clause 4.2.4.
[3] NER clause 4.2.2.
[4] Refer to NER definition of credible contingency event.

satisfactory operating state for any credible contingency event. In determining the technical envelope[5], AEMO must take into account the factors specified in NER clause 4.2.5(c). These requirements are about maintaining and operating the physical power system.

The ST PASA is a part of the broader PASA suite[6] which involves the collection, analysis and disclosure of power system security and reliability information. ST PASA information is used by registered participants and AEMO to identify and address power system security and reliability issues in the pre-dispatch and short-term timeframes for a seven day horizon[7]. NER clause 3.7.3 includes the ST PASA requirements on registered participants to provide the inputs and AEMO to provide outputs and publish ST PASA.

This is used to inform:

- Market participants of forecast supply shortages or low reserves so they can make commercial decisions in response to changes in the power system, potentially reducing the need for AEMO market intervention to address any power system security or reliability issues.
- AEMO actions needed to maintain power system security or reliability, which could include:
  - Assessing planned network outages.
  - Intervention in the NEM, e.g. issue a direction or activate RERT.

Figure 1 shows some of the decisions that market participants and AEMO make in the zero to seven day timeframe, which are informed by the current ST PASA.

Figure 1 AEMO and market participant decisions in the ST PASA timeframe

AEMO	Market Participants
• Reserve assessment • Issuing LOR market notices • Gas supply / gas supply guarantee • Network outage management and recall • Request to provide Generator outage recall information • Market interventions (directions and use of RERT) • Load shedding	• Commitment, decommitment and minimum loading • Small hydro storage management • Battery storage management (7 day pre-dispatch) • Infer expected prices • Maintenance and outage management • Fuel management • Staffing levels of power stations (restarting) • Management of demand resources • Embedded generation management • Short-term contracting • FCAS and preparation of emergency reserves for RERT

NER clause 3.7.3 specifies the relevant factors AEMO needs to take into account in producing ST PASA, including generation and load forecasts, scheduled constraints, network constraints and outages, and any energy constraints for generating units.

Current ST PASA information over the next seven day period is published from:

- Pre-dispatch PASA: Runs every 30 minutes on the 30-minute boundary, and covers from now until the end of the trading day for which dispatch bid prices are firm[8]. Pre-dispatch PASA is triggered by, and

[5] NER clause 4.2.5(a).
[6] Under the NER, PASA includes both ST PASA (NER clause 3.7.3) and MT PASA (NER clause 3.7.2). MT PASA covers a forecasting horizon of two years.
[7] NER clause 3.7.3 requires AEMO to publish ST PASA for a six-day horizon, however in practice it is published for seven days. ST PASA files are published on AEMO's website: https://aemo.com.au/en/energy-systems/electricity/national-electricity-market-nem/data-nem/market-management-system-mms-data/projected-assessment-of-system-adequacy-pasa and https://aemo.com.au/energy-systems/electricity/national-electricity-market-nem/data-nem/market-data-nemweb.
[8] Bid prices for the next trading day are firm at 1230 EST, hence Pre-dispatch PASA runs after 1230 EST will extend by a full trading day.

runs over the same horizon, as the NEMDE pre-dispatch process. Pre-dispatch PASA uses as inputs some results from the corresponding NEMDE pre-dispatch run: targets for daily energy-constrained units and constraints that are applied.

- Short term PASA: Runs every 60 minutes on the 60-minute boundary, and covers from the first interval after the end of the Pre-dispatch PASA for the following six trading days.

Hence the 1230 hrs pre-dispatch PASA run will overlap with the 1200 hrs short term PASA run by the additional trading day, until the 1300 hrs short term PASA run occurs.

Apart from their different timings (and to the extent that pre-dispatch PASA uses NEMDE pre-dispatch results) both the pre-dispatch and short term PASA processes use the same types of inputs and use a common PASA solver. Further information on how ST PASA is currently modelled is set out in the ST PASA process description[9] and table 1 identifies how NER clauses relate to the published inputs and outputs.

2.2 Existing NER procedures related to ST PASA

AEMO publishes the ST PASA Process Description, Reserve Level Declaration Guidelines (RLDG) and Reliability Standard Implementation Guidelines (RSIG), which are relevant to, or rely on, ST PASA.

2.2.1 ST PASA Process Description

The ST PASA Process Description is published under NER clause 3.7.3 and currently describes the:

- Process.
- Obligations on registered participants regarding inputs.
- Details of the calculations performed.
- Detailed information of the outputs produced.

ST PASA published outputs include low reserve conditions (LRC) and lack of reserve conditions (LOR).

2.2.2 Reserve Level Declaration Guidelines (RLDG)

AEMO is required to publish the RLDG which describes the methodology AEMO applies in determining an LOR condition, which in turn indicates to market participants that there are insufficient capacity reserves to avoid load shedding given forecast conditions[10]. ST PASA assesses the probability of capacity reserves being insufficient to avoid load shedding. A shortfall in available capacity leads to load shedding.

The RLDG also describes the forecast uncertainty measure (FUM) which is used as a post-processing tool for ST PASA outputs to account for forecasting uncertainties that can affect reliability of supply. Additionally, the RLDG describes how AEMO determines credible contingencies for the purposes of AEMO's power system security responsibilities[11].

2.2.3 Reliability Standard Implementation Guidelines (RSIG)

The RSIG sets out how AEMO will implement the reliability standard and interim reliability measure[12], noting that AEMO must also maintain and monitor the power system to ensure a reliable operating state. In relation to ST PASA and the RSIG, the NER requires AEMO to:

- Clause 3.7.3(h)(5) – identify and quantify any projected failure to meet the reliability standard.

[9] Refer to AEMO's website, here: https://aemo.com.au/-/media/files/pdf/0431-0004-pdf.pdf
[10] The RLDG are published under NER clause 4.8.4A.
[11] A credible contingency event is described in NER clause 4.2.3(b).
[12] Refer to clause 3.9.3D.

- Clause 4.8.4(b) – declare a LOR condition if it considers that the probability of involuntary load shedding is, or is forecast to be, more than remote.

2.3 Stakeholder engagement

In December 2019, AEMO engaged consultants Intelligent Energy Systems (IES) and Steve Wallace Advisory (SWA) to assess existing ST PASA limitations and identify changes to ST PASA to meet expected future needs and potentially replace the existing system and processes.

The consultants undertook individual interviews with market participants and held stakeholder sessions with AEMO and market participants from December 2019 to February 2021. These interviews and stakeholder sessions were conducted to identify ST PASA shortcomings and to identify future changes. Additionally, the consultants undertook a review of international practices to understand how other markets addressed similar reliability related issues.

Informed by stakeholder and AEMO feedback, IES and SWA developed business requirements and a proposed high level design for the new ST PASA system. AEMO published the high level design report in June 2020 and held a further stakeholder workshop. In May 2021, AEMO completed a proof of concept to determine the feasibility of the proposed high level design.

AEMO is commencing work on the detailed design of the new ST PASA system, which will align with the proposed rule, and will continue to engage with interested stakeholders during this process. The work to redevelop ST PASA will run in parallel to the AEMC's rule change consultation and AEMO's procedure consultations.

More information on the ST PASA Replacement Project and stakeholder engagement is on AEMO's website[13].

2.4 ST PASA replacement and related NEM reforms

This section describes the relationship between the proposed rule (and the ST PASA Replacement project) and other related reforms. AEMO considers these reforms to be outside the scope of this rule change proposal.

2.4.1 Essential system security services and scheduling and ahead mechanisms

The Energy Security Board (ESB) and AEMC are considering changes for essential system services and associated scheduling mechanisms to support the secure operation of the power system. These initiatives include the potential for a unit commitment for security (UCS), a system security mechanism (SSM), and an operating reserves market. The ESB's April 2021 Options Paper recognises these as reforms for immediate implementation, and the AEMC is already considering these in several rule change proposals under consultation, these include:

- UCS – Capacity commitment mechanism for system security and reliability services[14].
- SSM – Synchronous services markets[15].
- Operating reserves market[16].

The ST PASA is a mechanism used to forecast power system security and reliability of supply for the seven day period. While the initiatives under consideration by the ESB and AEMC are intended to address issues

[13] See: https://aemo.com.au/en/initiatives/trials-and-initiatives/st-pasa-replacement-project.
[14] See: https://www.aemc.gov.au/rule-changes/capacity-commitment-mechanism-system-security-and-reliability-services.
[15] See: https://www.aemc.gov.au/rule-changes/synchronous-services-markets.
[16] See: https://www.aemc.gov.au/rule-changes/operating-reserve-market.

related to the secure operation of the power system, these are separate and distinct from ST PASA because these consider pricing and scheduling of units for system security.

As the design of these changes develop, AEMO will continue to assess the implementation relationships and timing of these market changes.

2.4.2 Integrating Energy Storage Systems Rules consultation

The Integrating Energy Storage System into the NEM rule change (IESS rule change) proposes changes to better integrate energy storage systems into the NEM, with a focus on integrating grid-scale energy storage systems and hybrid systems. AEMO's proposed rule did not include changes to NER clause 3.7.3 (ST PASA rule) to address energy storage systems in ST PASA. When AEMO submitted the IESS rule change in August 2019, AEMO considered it would be more effective to only make changes for energy storage to be incorporated into the replaced ST PASA system.

Scheduled energy storage capability, however defined after the IESS rule change, will need to be integrated into the proposed rule. ST PASA will continue to need information on the energy limits of all units for modelling purposes, noting that the available capacity of battery energy storage systems may change more quickly than other technologies closer to the dispatch timeframe.

AEMO's intent is for ST PASA to be able to model energy storage systems, particularly batteries, better because more specific information on the technology type will be used in the forecasts[17]. The AEMC is expected to publish its Integrating Energy Storage System into the NEM draft determination by 29 July 2021. AEMO will continue to assess the implementation relationships and timing of these market changes.

2.4.3 Wholesale Demand Response

The Wholesale Demand Response Mechanism rule (WDR rule) becomes effective on 24 October 2021. The WDR rule includes wholesale demand response units (WDRUs) in ST PASA and AEMO must update the current ST PASA system for this change. To implement WDRUs, AEMO is making relatively small implementation changes to the current ST PASA to treat WDRUs as scheduled load. There is no intersection between the changes being implemented for WDR and the ST PASA Replacement project.

3. STATEMENT OF ISSUE

AEMO's ST PASA Replacement project to replace the current ST PASA processes and systems is underway and AEMO continues to engage with interested market participants on this. This project has been undertaken after assessing the limitations of the current ST PASA system and the need for this system to account for a future where energy storage, VRE, demand response and DER provide increasing services. The link between the NER and ST PASA system is that the NER establishes the ST PASA forecasting horizon, defines the required inputs and outputs for the system, and requires AEMO to publish specific information for registered participants. NER clause 3.7.3 is very detailed and prescriptive, reflecting a previous drafting approach where most of the detailed information is included in the NER.

AEMO, market participants and consultants IES and SWA identified the following major issues with the current ST PASA system, including it is unable to:

- Model new technologies and processes, e.g. batteries, demand response and DER.
- Accurately model capacity reserves across the NEM regions.
- Model unusual network events like the system separation events seen in summer 2019-20[18].

[17] Through the detailed design, in consultation with stakeholders, AEMO will work through the detail of how these technologies are to be modelled.
[18] This refers to:

- Account for the availability of essential system services, including frequency control ancillary services, inertia, system strength, and ramping requirements.

Forecasts that do not take into account all the relevant information may result in either avoidable load shedding or unnecessary intervention (e.g. activation of RERT contracts) and costs to consumers.

While these issues are not directly caused by the NER, they reflect the current ST PASA process and system limitations which are embedded in the NER. AEMO considers it is important to amend NER clause 3.7.3 to ensure it is understandable and removes unnecessary prescription.

The NER does not prohibit AEMO from replacing the ST PASA system as long as it continues to meet its publishing requirements. However, AEMO recognises that there are both inputs and outputs specified in NER clause 3.7.3 that may no longer be useful for market participants or used in the new ST PASA system. Unnecessarily requiring information in the NER instead of in consulted on procedures can lead to a misalignment of what is needed or used and creates ambiguity for market participants.

For the new ST PASA system to continue to meet its objectives and develop with a changing power system, AEMO considers a less prescriptive and more understandable rule is needed that continues to define the minimum requirements at a high level to allow AEMO the flexibility to consult with market participants on the more detailed design of the inputs, outputs and information to be published.

The current ST PASA is published for a seven trading day period, however the NER specifies this covers a six day period. This inconsistency between the NER and what AEMO publishes creates ambiguity for market participants. AEMO understands that market participants support AEMO publishing ST PASA for a seven day period.

As a part of the ST PASA Replacement project, AEMO will also need to redevelop its existing procedures to ensure the detailed inputs and outputs and what is published is identified and understandable for market participants. Currently there are three procedures that include ST PASA related information, including the ST PASA Process Description (currently produced under NER clause 3.7.3(j)), the RLDG and RSIG.

3.1 Publishing individual unit available capacity and PASA availability

Currently, the NER only allows AEMO to publish ST PASA generating unit available capacity and PASA availability aggregated by region. AEMO considers that it would be useful for the available capacity of individual units to be available and transparent to all market participants, particularly those with smaller portfolios and who currently may have less information available on which to base their operational and commercial decisions. This information asymmetry could be addressed by requiring AEMO to publish this information. Providing all market participants with this information is likely to improve smaller market participant's decision-making with respect to the scheduling of outages. This approach is also consistent with the MT PASA requirement in NER clause 3.7.2(f)(5), noting this is for a longer forecasting horizon.

Providing this information is also likely to have benefits for power system security. Due to the increasing penetration of VRE technologies in the NEM generation mix, there are increasing risks to power system security relating to inertia and system strength shortfalls, where these are sometimes heightened during planned network outages. Management of these issues require certain individual units, a combination of certain synchronous generating units, or other synchronous plant to be in service during the planned

- 30 December 2019, Loss of an intra-regional line (051 Lower Tumut to Wagga 330 kV line) reduced Victorian reserves by approximately 1,000MW (leading to AEMO exercising RERT). This loss of reserve could not be forecast as the current system could not model the loss of intra-regional lines.
- 4 January 2020, Victoria (Vic) and New South Wales (NSW) separation event – the separation did not occur at the regional boundary. Some of the NSW (Wagga) load and generation was left connected to Vic instead of NSW. The current system could not model this scenario and provide accurate regional reserve figures as it uses a regional model. To address this, AEMO manually calculated the regional information required to be published.

network outage. Transparency of generating unit (and other 'units') availability will allow NSPs to better coordinate their outages with registered participants.

AEMO considers that a market participant's decision to provide capacity is also informed by knowledge of what other units are available at that time, which may impact their decision to generate because they need to assess whether certain generating units will be providing system strength services that are needed for them to operate. Further, as the NEM transitions to more VRE and 'traditional' technologies are mothballed, retired from service or require more maintenance outages, it becomes even more necessary for market participants to have information on the available capacity of other units in the ST PASA timeframe.

3.2 PASA availability definition

PASA availability is used for MT PASA (NER clause 3.7.2) and ST PASA (NER clause 3.7.3) and is defined in the NER as the physical plant capability of a scheduled generating unit, scheduled load or scheduled network service that can be made available on 24 hours' notice. For ST PASA, this timeframe is overly prescriptive, and it is more useful to allow registered participants to notify a unit's PASA availability over different time periods.

The definition also describes that the physical plant capability takes into account ambient weather conditions "…in the manner described in the procedure prepared under clause 3.7.2(g)". This is an error as NER clause 3.7.2(g) does not refer to a procedure.

4. HOW THE PROPOSAL WILL ADDRESS THE ISSUES

4.1 How the proposal will address the issues

AEMO has proposed a principles-based drafting approach to NER clause 3.7.3. The objective is to ensure the new ST PASA system can continue to be refined and adapted to produce information that meet future market needs, and AEMO will not be required to continue publishing information in ST PASA if it is no longer relevant to market processes or participant decisions. The proposed rule removes unnecessary NER prescription and allows AEMO the flexibility to detail the ST PASA inputs, outputs and information to be published within AEMO procedures, which will be consulted on with registered participants. The proposed rule simplifies the drafting of the information that registered participants must provide to AEMO without changing the underlying requirements[19]. The inputs and information AEMO is to publish are redrafted to include higher level input factors and includes drafting simplifications.

The proposed rule includes more specific requirements for the ST PASA outputs to be published for individual units, to ensure that there is clear direction and authority in the NER to identify forecast capacity and PASA availability on a disaggregated basis.

AEMO considers the proposed rule represents a balanced approach to rule, procedure and system development, allowing sufficient flexibility to implement modelling changes identified in consultation with stakeholders in a more timely manner with less cost involved, but always meeting the ST PASA objectives specified in the NER.

The proposed rule also clarifies that ST PASA is to be published for a seven day period, which aligns with the current ST PASA.

Table 1 shows the proposed changes for NER clause 3.7.3 and AEMO's rationale. For further information, this table also sets out how the requirement of each paragraph is currently met.

[19] The existing requirement on NSPs to provide AEMO with information on planned network outages is unchanged.

Table 1 Summary of the existing NER clause 3.7.3 and proposed change

	Existing NER clause 3.7.3	Description of how the requirement is met	Proposed rule and AEMO's rationale
(a)	ST PASA must be published at least daily by AEMO in accordance with the spot market timetable.	No change.	The requirement is retained and included proposed paragraph (c)(1). This is a drafting improvement. This is a minimum requirement and AEMO intends that the timetable will specify how frequently ST PASA will be published, AEMO considers this should be every half hour for up to two trading days after the current trading interval, however this will be determined in consultation with stakeholders.
(b)	ST PASA covers the period of six trading days starting from the end of the trading day covered by the most recently published pre-dispatch schedule with a trading interval resolution.	Currently, AEMO publishes the ST PASA which covers the 6-day period as per the NER requirement. AEMO also publishes the PD PASA, which covers the same period as the pre-dispatch schedule. Collectively, the PD PASA and ST PASA cover all half-hour intervals over the next seven days. The EMMS PD PASA and ST PASA tables are published on the NEMWeb pages of AEMO's website.	The requirement is mostly retained in paragraph (a) as a description of the ST PASA objective. However, the ST PASA coverage period is increased to seven days from six (i.e., it includes the pre-dispatch period leading up to ST and is consistent with the current NEMWeb publication), and the objective of ST PASA is described as providing a forecast of power system security and reliability of supply over that period.
(c)	AEMO may publish additional updated versions of the ST PASA in the event of changes which, in the judgement of AEMO, are materially significant.	N/a. Note, if this was needed, AEMO would publish a market notice. The next run would provide the updated ST PASA information.	This clause is retained in paragraph (c)(2).
(d)	AEMO must prepare the following short term PASA inputs:	See below.	Broadly, much of the current detail should be specified in the ST PASA procedures (revised paragraph (b)). This will allow AEMO to identify the inputs needed to produce the ST PASA as they change with greater variability and forecasting developments. Revised paragraph (d) also explicitly links to the inputs supplied by registered participants and to the ST PASA objective. It is proposed that AEMO would consult on the ST PASA procedures, but with an allowance for a single stage consultation corresponding with the RLDG, for similar reasons.
	(1) forecast load information for each region which is to include: the 10% probability of exceedance half-hourly load and most probable half hourly load on the basis of past trends, day type, and special events; and all scheduled load and other load except for pumped storage loads, which must subsequently be adjusted in accordance with dispatch bids for scheduled load;	These inputs are included in the 10%, 50% and 90% POE demand forecasts, however ST PASA currently only uses the 10% (for LRC) and 50% POE (for LOR). AEMO takes into account the scheduled loads and the pumped storage loads which are excluded from these loads forecasts. This information is not required to be published in ST PASA.	To be replaced by a higher level requirement for forecast load and generation, taking into account forecasting uncertainties This approach allows AEMO to take into account uncertainties in both the supply-side and demand-side.

	(3) forecast network constraints known to AEMO at the time; and	No change.	Retained, and expanded to include notified network outages, reflecting the submission requirements for NSPs.
	(4) Unconstrained intermittent generation forecast for each semi-scheduled generating unit for each trading interval.	AEMO uses information from AWEFS and ASEFS, this includes 90% POE (for LRC) and 50% POE (for LOR) for UIGF	AEMO would continue to take the UIGF into account and this is covered by proposed paragraph (d)(2). Further detail would be specified in the ST PASA procedures.
(e)	Requires Scheduled Generators and Market Participants to provide the following information in accordance with the timetable, including:	See below	
	The available capacity of a scheduled generating unit, scheduled load or scheduled network service	This information is provided through registered participant's dispatch bids and offers.	Proposed paragraph (e)(1) consolidates current (1) and (2) to require the available capacity and PASA availability to be provided by registered participants in respect of their scheduled generation or load, scheduled network services and wholesale demand response units. the reference to "expected market conditions" is removed as this is already captured by registered participant's current intentions and best estimates. Note *PASA availability* definition will be changed to allow an applicable recall period to be specified so it is not 24 hours by default. This will be provided for in the RSIG, to enable a distinction to be made between MT and ST PASA information.
	The PASA availability of a scheduled generating unit, scheduled load or scheduled network service	As above.	
	Projected daily energy availability for energy constrained scheduled generating units and energy constrained scheduled loads.	As above.	Registered Participants would continue to provide this information via their dispatch bids and offers for their energy constrained assets, including energy storage. Note that AEMO proposes a broader definition of energy constraint as it was inconsistent with the definitions of energy constrained generating unit/load (which can be deleted). The proposed definition is consistent with the corresponding term for wholesale demand response constraint.
(f)	If AEMO considers it reasonably necessary for adequate power system operation and the maintenance of power system security and reliability of supply, Registered Participants who may otherwise be exempted from providing inputs for the PASA process must do so to the extent specified by AEMO.	No change.	No change proposed.
(g)	NSPs are required to provide AEMO with an outline of planned network outages in accordance with the timetable and any other information on planned network outages that is reasonably requested by AEMO to	All planned network outages are provided by NSPs through the Network Outage Scheduler.	No change proposed.

	assist AEMO to meet its obligations under clause 3.7.3(h)(5).		
(h)	AEMO is required to prepare and publish the following information for each trading interval in the period covered by the ST PASA in accordance with spot market timetable:	See below.	Broadly, much of the current detail should be specified in the ST PASA procedures (revised paragraph (b)). This will allow AEMO to publish (after consultation) additional or different information and formats that are useful for participants and may change over time, beyond a fundamental set of requirements specified in the revised paragraph (h) which covers forecast demand, supply, network constraints and reliability shortfalls. Specific provision is made to allow publication of individual scheduled plant /WDR available capacity and PASA availability, to ensure this is a clear right and obligation.
	(1) forecasts of the most probable load (excluding the relevant aggregated MW allowance referred to in subparagraph (4B)) plus reserve requirement (as determined under clause 3.7.3(d)(2)), adjusted to make allowance for scheduled load, for each region;	This is included in the ST PASA tables as: 'DEMAND50' excludes non-scheduled generation and scheduled load 'CAPACITYREQ' is 'DEMAND50' plus the reserve requirement.	Proposed (h)(1) to replace existing (h)(1), (2) and (3), and to specify that AEMO needs to publish load forecasts at different probability of exceedance levels. The detail of what will be published would be in the ST PASA procedures.
	(2) forecasts of load (excluding the relevant aggregated MW allowance referred to in subparagraph (4B)) for each region with 10% and 90% probability of exceedance;	This is included in the ST PASA tables as 'DEMAND10' and 'DEMAND90', both exclude the non-scheduled generation and scheduled load.	
	(3) forecasts of the most probable energy (excluding the relevant aggregated MW allowance referred to in subparagraph (4B)) for each region and trading day;	This is included in the ST PASA tables as 'ENERGYREQDEMAND50', which excludes the non-scheduled generation and scheduled load.	
	(4) aggregate generating unit availability (excluding the relevant aggregated MW allowance referred to in subparagraph (4B)) for each region;	This is included in the ST PASA tables as 'AGGREGATECAPACITYAVA ILABLE', which excludes semi-scheduled and non-scheduled generation.	Proposed (h)(4) to replace (h)(4), (4AA), (4AB), which will specify that AEMO needs to publish forecasts of the available capacity of individual scheduled generating units, semi-scheduled generating units, scheduled loads, scheduled network services and wholesale demand response units. This replaces the requirement for AEMO to publish aggregate generating unit availability to provide more information for registered participants. (h)(4A) specifies a similar requirement for the capacity to produce energy in each 30-minute period, including individual PASA availability for those listed facilities. The detail of what will be published would be in the ST PASA procedures.
	(4AA) aggregate capacity (excluding the relevant aggregated MW allowance referred to in subparagraph (4B)) for each region, after allowing for the impact of network constraints, that can be generated continuously, calculated by adding the following categories: the available capacity of scheduled generating units that are able to operate at the availability as notified to AEMO under paragraph (e)(1); and the forecast generation of semi-scheduled generating units as provided by the unconstrained intermittent generation forecasts;	This is included in the ST PASA tables as 'UNCONSTRAINEDCAPACITY', which excludes the non-scheduled generation.	
	(4AB) aggregate capacity (excluding the relevant aggregated MW allowance referred to in subparagraph (4B)) for	This is included in the ST PASA tables as 'CONSTRAINEDCAPACITY', which	

	each region, after allowing for the impact of network constraints, that cannot be generated continuously at the available capacity referred to in subparagraph (4AA)(i) due to specified daily energy constraints;	excludes the non-scheduled generation.	
	(4A) aggregate generating unit PASA availability (excluding the relevant aggregated MW allowance referred to in subparagraph (4B)) for each region;	This is included in the ST PASA tables as 'AGGREGATEPASAAVAILABILITY', which excludes semi-scheduled and non-scheduled generation.	Specifies that AEMO needs to publish forecasts of the capacity to produce or reduce consumption of energy, including forecast PASA availability of individual scheduled generating units, scheduled loads, scheduled network services and wholesale demand response units. The detail of what will be published would be in the ST PASA procedures.
	(4B) the aggregated MW allowance (if any) to be made by AEMO for generation from non-scheduled generating systems in each forecast: (i) of the most probable load referred to in clause 3.7.3(h)(1); and (ii) referred to in clauses 3.7.3(h)(2), (3), (4), (4A), (4AA) and (4AB);	Relevant for paragraphs (h)(1), (h)(2), (3), (4), (4A), (4AA) and (4AB). This is included in the ST PASA tables as 'TOTALINTERMITTENTGENERATION'	Deleted as this level of detail would be included in the ST PASA procedures. As described above, references in paragraphs (h)(1), (h)(2), (3), (4), (4A), (4AA) and (4AB) are no longer relevant.
	(4C) in respect of each forecast: (i) of the most probable load referred to in clause 3.7.3(h)(1); (ii) referred to in clauses 3.7.3(h)(2), (3), (4), (4A), (4AA) and (4AB), a value that is the sum of that forecast and the relevant aggregated MW allowance (if any) referred to in clause 3.7.3(4B); and	Relevant for paragraphs (h)(1), (h)(2), (3), (4), (4A), (4AA) and (4AB). This is included in the ST PASA tables as 'DEMAND_AND_NONSCHEDGEN'.	
	(5) identification and quantification of: (i) any projected violations of power system security; (ii) any projected failure to meet the reliability standard as assessed in accordance with the reliability standard implementation guidelines; (iii) [Deleted] (iv) forecast interconnector transfer capabilities and the discrepancy between forecast interconnector transfer capabilities and the forecast capacity of the relevant interconnector in the absence of outages on the relevant interconnector only; and (v) when and where network constraints may become binding on the dispatch of generation or load.	This is included in the ST PASA constraint solution table.	Proposed (h)(5)(iia) to include a requirement on AEMO to publish forecast reserve conditions identified under NER clause 4.8.4. Delete paragraph (h)(5)(iv), the new ST PASA will be a nodal model therefore there is no need for AEMO to prepare and publish information on forecast interconnector capabilities or any discrepancies in the transfer capabilities. Amend paragraph (h)(5)(v) to replace the term "binding" with "limit". This is to ensure there is no confusion over the term binding when it refers to generic constraints.
(i)	If in performing the ST PASA AEMO identifies any projected failure to meet the reliability standard in respect of a region as assessed in accordance with the reliability standard implementation guidelines, then AEMO must use its reasonable endeavours to advise the Jurisdictional System Security Coordinator who represents a participating jurisdiction in that region	No change.	No change.

	of any potential requirements during such conditions to shed sensitive loads.		
(j)	AEMO must publish the procedure it uses for preparation of the ST PASA.	No change to requirement.	Delete. Requirement retained in proposed paragraph (b).

4.1.1 Publishing individual unit available capacity and PASA availability

The proposed rule includes a new requirement for AEMO to publish the available capacity and PASA availability of individual scheduled and semi-scheduled generating units[20], scheduled loads, scheduled network services and wholesale demand response units. This is to provide registered participants (typically NSPs and Generators) with information to communicate with each other and respond to forced and scheduled outages with capacity changes. It is increasingly important that all market participants have access to this information to understand what units are on (or off) in the ST timeframe, e.g. to know whether there will be sufficient system strength to operate.

While AEMO considers this will be useful information for registered participants to make appropriate scheduling decisions that impact market conditions, particularly those with smaller portfolios, AEMO is aware that some registered participants may be concerned that the individual unit's available capacity will be published in the pre-dispatch timeframe (because the new ST PASA would also cover the PD timeframe). AEMO encourages the AEMC to test whether individual unit available capacities should be provided in either the PD or the broader ST PASA timeframe (seven days), noting that AEMO seeks to provide information that is useful while having sufficient requirements in the NER to publish information. If individual unit available capacities are to be published in the broader ST PASA timeframe, the AEMC will need to consider if changes are needed to NER clause 3.8.20(j)(6) to ensure the publishing requirements are consistent with the proposed rule.

4.1.2 PASA availability definition

The proposed rule deletes the reference to the 24 hour notice period and instead provides that relevant participants should specify the capacity that can be made available within a given recall period in accordance with the RSIG. Since the PASA availability concept is used in both ST PASA and MT PASA, AEMO's intention is to separately define the recall period for ST PASA and MT PASA in the RSIG. While this will remain at up to 24 hours for MT PASA for the present, participants will be required to specify the recall time for relevant plant in their ST PASA inputs.

The proposed rule also deletes the incorrect reference in this definition to the procedure prepared under NER clause 3.7.2(g), and also makes minor drafting improvements.

4.1.3 Drafting improvements

A number of drafting improvements have been proposed, including:

- Where possible, using generic references to 'Registered Participants' to replace existing references to 'Generators' and 'Market Participants'.
- Amending the Chapter 10 definition of 'energy constraint' and deleting the definitions of 'energy constrained scheduled generating unit' and 'energy constrained scheduled load'. The current definitions do not align, and the definition of 'energy constraint' unnecessarily references the generating unit technology type by referencing different fuel sources. The proposed revised definition

[20] PASA availability is not published for semi-scheduled generating units.

of 'energy constraint' aligns with the 'wholesale demand response constraint' with the addition of 'in a specified period', which if adopted should also be applied to a WDR constraint.

- Deleting the short term PASA inputs definition. If the proposed drafting improvements are accepted they will remove the need for this definition.

4.2 Alternative options to address the issues

An alternative option to support the ST PASA redevelopment is for the NER to include a very detailed specification of the ST PASA requirements. AEMO considers that this is an inflexible approach that is not justified considering the need for NEM systems and processes to adapt more rapidly to changing technological and market conditions.

AEMO has considered possible alternatives for the following aspects of ST PASA in the proposed rule:

- ST PASA for a seven day time period including the PD timeframe: Alternative to publish ST PASA for a six day period excluding the PD timeframe. AEMO does not consider this a useful change that stakeholders support.
- Available capacity and PASA availability for each individual unit:
  - Publish information on an aggregate regional basis. AEMO does not consider this provides sufficient market information to facilitate market participants' operational and market decisions.
  - Specify a different time period for the publication of individual capacity information (e.g. commencing from a later time to exclude the PD timeframe). AEMO encourages the AEMC to engage stakeholders on whether this is appropriate.
- PASA availability definition – create separate NER definitions for ST PASA and MT PASA availability. This option was not selected because one of the objectives is to simplify the NER and retain appropriate flexibility to separately define the recall period for ST PASA and MT PASA if this is needed.

5. PROPOSED RULE

5.1 Description of the proposed Rule

A draft of AEMO's proposed rule is provided in Appendix A. This is a mark-up of NER version 164 which also incorporates changes made in Rule 2020 No. 9 (WDR Rule).

Amend NER clause 3.7.3:

- Replace paragraph (a) with an objective of short term PASA, which is to provide forecasts of power system security and reliability of supply for each 30-minute period for a period of seven days from the day of publication.
- Replace paragraph (b) and require AEMO to develop and publish procedures that describe:
  - How AEMO will prepare ST PASA inputs reflecting the factors in paragraph (d).
  - Details of the ST PASA information AEMO will publish to meet the requirements of paragraph (h).
  - The processes and methodologies AEMO will apply to produce the ST PASA information.
- Insert new paragraph (b1), AEMO must comply with the Rules consultation procedures to develop and amend the ST PASA procedures, except:
  - A single-stage consultation process can be applied similar to the one that applies for NER clause 4.8.4 (the RLDG).

  - AEMO may make minor or administrative changes without complying with the Rules consultation procedures.
- In paragraph (c), include existing paragraph (a) which requires AEMO to publish ST PASA at least daily in accordance with the timetable.
- Replace paragraph (d) and instead require AEMO to prepare ST PASA inputs, including:
  - Forecast load and unscheduled generation which takes into account forecasting uncertainties, deleting existing (d)(1), (2), (3), and (4).
  - Forecast scheduled plant and wholesale demand response unit availability, including any constraints.
  - Forecast network constraints and notified network outages.
  - Any other factors AEMO considers relevant and are consistent with the ST PASA objective.
- In paragraph (e), replace references to Scheduled Generator and Market Participant with generic term, Registered Participant, and:
  - In sub-paragraph (1), amend to include PASA availability.
  - Delete sub-paragraph (2) and (3), included in (1).
  - In sub-paragraph (4), amend to refer to energy constraints (defined term below) and make minor drafting amendments including specifying wholesale demand response constraints refer to wholesale demand response units.
- In paragraph (h), amend to require AEMO to publish the ST PASA information to reflect the objective in paragraph (a), and include the following information for each 30-minute period in the ST PASA period:
  - In sub-paragraph (1), delete (h)(1), (2) and (3) and replace with load forecasts at a range of probability of exceedance levels which takes into account forecasting uncertainties.
  - In sub-paragraph (4), delete (h)(4), (4AA), (4AB), (4A), (4B) and (4C) and replace with:
    - 'New' (4), forecasts of available capacity from individual scheduled plant and wholesale demand response units.
    - 'New' (4A), forecasts of PASA availability of individual scheduled generating units, scheduled loads, scheduled network services and wholesale demand response units.
  - In sub-paragraph (5):
    - Include (iia) to include a requirement on AEMO to publish forecast reserve conditions identified under NER clause 4.8.4.
    - Delete (iv).
    - Amend (v) to replace the term "binding" with "limit".
- Delete paragraph (j), requirement retained in proposed paragraph (b).

Definitions:

- Amend the energy constraint definition to refer to a limitation on the capability of a scheduled generating or scheduled load to produce or consume energy in a specified period at the level that would occur if the limitation were removed.
- Delete Chapter 10 definitions:
  - Energy constrained scheduled generating unit.

  - Energy constrained scheduled load.
  - Short term PASA inputs.
- Amend PASA availability definition to:
  - Specify that the recall period is to be defined in the reliability standard implementation guidelines and this replaces the current 24 hour requirement.
  - Delete reference to the ambient temperature conditions being prepared under clause 3.7.2(g).
  - Minor drafting improvements.

5.2 Transitional matters

Transitional provisions may be required to accommodate consultation and publication of the updated and expanded ST PASA procedure and related procedures and guidelines, e.g. RSIG, RLDG, spot market operations timetable to reflect the amending rule and ST PASA Replacement project implementation.

6. HOW THE PROPOSED RULE CONTRIBUTES TO THE NATIONAL ELECTRICITY OBJECTIVE (NEO)

AEMO considers the proposed rule will promote efficient investment in, and operation of electricity supply, in the long term interest of consumers by:

- Improving the transparency and quality of information in the NEM, which is to be publicly available data published on AEMO's website. Together with the changes that will be made to the ST PASA procedure and RLDG, the proposed rule will provide for greater transparency in the ST PASA timeframe, the information registered participants are to provide, the inputs and outputs AEMO must take into account in the ST PASA procedure, and the information AEMO is required to publish. This includes the individual unit availability and PASA availability to ensure registered participants and interested stakeholders can make better informed decisions in relation to scheduling planned outages in the seven day timeframe[21].
- Promoting reliability and security of the power system. The proposed rule maintains minimum requirements on AEMO and registered participants and allows AEMO sufficient flexibility to redevelop ST PASA inputs and outputs that are to be taken into account as the ST PASA is redeveloped. As discussed, the redevelopment of ST PASA will provide more accurate and better information on which registered participants and interested stakeholders can respond to supply and demand imbalances[22] and for AEMO to intervene in the NEM to ensure power system security or reliability.
- Minimising direct and indirect costs. AEMO considers that costs will be minimised by the NER allowing AEMO to consult with stakeholders on the specific detail of the inputs and outputs, and further information to be published, while maintaining the necessary requirements in the NER. This facilitates the redevelopment of the ST PASA system which will provide more accurate and better information for registered participants and interested stakeholders to make decisions to respond to supply and demand imbalances. Additionally, AEMO will also use this information in deciding when to intervene in the NEM to ensure power system security or reliability. This may reduce RERT contract activation and, by using RERT more appropriately, preventable load shedding could be avoided, which would reduce costs being passed to consumers.

[21] Registered participants and interested stakeholders will also take into account other information, e.g. commercial information in making their decisions.
[22] Ibid.

- Regulatory certainty. The proposed rule clarifies the current ST PASA timeframe, while providing high level ST PASA inputs and outputs that will be further clarified through a rules consultation procedure where further detail will be specified. This approach allows AEMO and registered participants to formalise the information requirements needed.

7. EXPECTED BENEFITS AND COSTS OF THE PROPOSED RULE

The expected benefit of the proposed rule is to more accurately and efficiently forecast power system reliability over the ST PASA timeframe, which will enable AEMO to meet its obligations to maintain power system security and reliability. This includes better forecasting information on future supply and demand which assists by providing registered participants and interested stakeholders with the necessary information to make commercial decisions and allows AEMO to more reliably predict when there are power system security and reliability issues that it needs to respond to (e.g. declare LOR conditions, activation of RERT contracts, directions to registered participants). Potentially, improving these signals will result in less load shedding and reduce the number and cost of market interventions. Lower costs benefit all NEM participants and consumers. The proposed rule and the new ST PASA methodology will achieve this by forecasting the physical system using a full network model at the nodal level.

The new ST PASA system will also have improved capability to account for 'new' technologies such as VRE, batteries and, in future, DER. As discussed, the existing NER does not prevent AEMO from forecasting in this way, however it does prescribe specific forecasting inputs and outputs that do not necessarily add value to AEMO's forecasting process and to market participants. It is preferable for these inputs and outputs to be located in NER guidelines to allow greater flexibility.

The proposed rule requires AEMO to publish individual unit availability and PASA availability which will benefit registered participants and interested stakeholders by improving information transparency to better inform decisions and improve co-ordination in relation to scheduling planned outages and maintenance work in the seven day timeframe.

The proposed rule also requires AEMO to redevelop the ST PASA procedure and RLDG in consultation with market participants, and as a part of this initiative AEMO will also consult on the RSIG. In redeveloping these procedures, AEMO seeks to ensure the NER and procedures capture relevant input and output requirements and that AEMO is required to publish information that is useful to market participants and interested stakeholders. Reconfiguring the relevant procedures is intended to simplify and make this information more accessible for registered participants and interested stakeholders.

The cost of the proposed rule is in redeveloping the ST PASA procedure, RLDG and RSIG in consultation with participants. This will support AEMO using more appropriate inputs and publishing more useful information to registered participants and interested stakeholders. The cost of replacing ST PASA is already budgeted for.

8. DRAFT RULE

This draft is based on version 164 of the NER and incorporates amendments made by the National Electricity Amendment (Wholesale demand response mechanism) Rule 2020 No. 9.
Amended unit definitions made as a result of the integrating energy storage systems rule currently under consultation by the AEMC would also need to be reflected in this rule.

3.7.3 Short term PASA

(a) The objective of the *short term PASA* is to provide forecasts of *power system security* and reliability of *supply* for each *30-minute period* in the seven *trading days* from the day of *publication*. ~~The *short term PASA* must be *published* at least daily by *AEMO* in accordance with the *timetable*.~~

(b) *AEMO* must develop and *publish*, and may amend, procedures describing:

(1) how *AEMO* will prepare inputs for the *short term PASA* reflecting the factors outlined in paragraph (d);

(2) the detailed *short term PASA* information *AEMO* will *publish* to meet the requirements of paragraph (h); and

(3) the processes or methodologies *AEMO* will apply to produce the *short term PASA* information.

(b1) In developing and amending the procedures under paragraph (b), *AEMO* must comply with the *Rules consultation procedures*, except that:

(1) rule 8.9 is to be read as if:

(i) paragraphs (g) to (j) do not apply;

(ii) paragraph (k)(4) does not apply;

(iii) paragraph (k)(5) is amended to require summaries of each issue, that the *consulting party* reasonably considers to be material, contained in valid written submission received from Consulted Persons or in meetings, and the *consulting party's* response to each such submission;

(4) the references in paragraphs (m) and (n) to "the procedures set out in this clause" are to be read as if they were references to "the procedures set out in this clause, as amended by clause 3.7.3(b1)(1)(i) to (iii)"; and

(2) *AEMO* may make minor or administrative amendments to the procedures without complying with the *Rules consultation procedures*.

[AEMO note: Sub-clauses (1) and (2) could be removed if the changes contemplated in AEMO's rule change proposal on the Rules consultation procedures (ERC 0323) were made.]

~~The *short term PASA* covers the period of six *trading days* starting from the end of the *trading day* covered by the most recently *published pre-dispatch schedule* with a *trading interval* resolution.~~

(c) *AEMO*:

(1) must *publish* the *short term PASA* at least daily in accordance with the *timetable*; and

(2) may *publish* additional updated versions of the *short term PASA* in the event of *changes* which, in the judgement of *AEMO*, are materially significant.

(d) *AEMO* must prepare inputs for the *short term PASA* that consider the following factors, informed by submissions received by *AEMO* under paragraphs (e) to (g):

(1) forecast *load* and *unscheduled generation*, taking into account forecasting uncertainties;

(2) forecast *scheduled plant* and *wholesale demand response unit* availability, including any applicable *constraints*;

(3) forecast *network constraints* and notified *network outages*; and

(4) any other factors *AEMO* considers relevant having regard to the objective of *short term PASA* under paragraph (a).

~~The following *short term PASA inputs* are to be prepared by *AEMO*:~~

~~(1) forecast *load* information for each *region* which is to include:~~

~~(i) the 10% probability of exceedence half-hourly *load* and most probable half hourly *load* on the basis of past trends, day type, and special events; and~~

~~(ii) all *scheduled load* and other *load* (including *wholesale demand response units*) except for pumped storage *loads*,~~

~~which must subsequently be adjusted in accordance with *dispatch bids* for *scheduled load* and *dispatch bids* for *wholesale demand response units*;~~

~~(2) **[Deleted]**~~

~~(3) forecast *network constraints* known to *AEMO* at the time; and~~

~~(4) an *unconstrained intermittent generation forecast* for each *semi-scheduled generating unit* for each *30-minute period*.~~

(e) The following information for the *short term PASA* must be submitted by each relevant *Registered* ~~*Scheduled Generator* and *Market*~~ *Participant* in accordance with the *timetable* and must represent the ~~*Scheduled Generator's or Market*~~ *Registered Participant's* current intentions and best estimates:

(1) *available capacity* and *PASA availability* of each of the *Registered Participant's scheduled generating units*, *wholesale demand response*

units, *scheduled loads* or *scheduled network services* in each relevant *30-minute period* ~~*trading interval* under expected *market* conditions~~; and

(2) [**Deleted**] ~~*PASA availability* of each *scheduled generating unit*, *wholesale demand response unit*, *scheduled load* or *scheduled network service* for each *trading interval*;~~

(3) [**Deleted**] ~~projected daily *wholesale demand response* availability for *wholesale demand response units* that are *wholesale demand response constrained*; and~~

(4) ~~projected daily *energy* *constraints* or *wholesale demand response constraints* (as applicable) availability for *energy constrained* *scheduled generating units*, and *energy constrained* *scheduled loads* or *wholesale demand response units*~~.

Note

This clause is classified as a civil penalty provision under the National Electricity (South Australia) Regulations. (See clause 6(1) and Schedule 1 of the National Electricity (South Australia) Regulations.)

(f) If *AEMO* considers it reasonably necessary for adequate *power system* operation and the maintenance of *power system security* and reliability of *supply*, *Registered Participants* who may otherwise be exempted from providing inputs for the *PASA* process must do so to the extent specified by *AEMO*.

Note

This clause is classified as a civil penalty provision under the National Electricity (South Australia) Regulations. (See clause 6(1) and Schedule 1 of the National Electricity (South Australia) Regulations.)

(g) *Network Service Providers* must provide to *AEMO* an outline of planned *network outages* in accordance with the *timetable* and provide to *AEMO* any other information on planned *network outages* that is reasonably requested by *AEMO* to assist *AEMO* to meet its obligations under clause 3.7.3(h)(5).

Note

This clause is classified as a civil penalty provision under the National Electricity (South Australia) Regulations. (See clause 6(1) and Schedule 1 of the National Electricity (South Australia) Regulations.)

(h) *AEMO* must ~~prepare and~~ *publish* ~~the following information~~ *short term PASA* information that reflects the objective in paragraph (a) and includes, for each *30-minute period* in the *short term PASA* period: ~~*for each trading interval (unless otherwise specified in subparagraphs (1) to (5)) in the period covered by the short term PASA in accordance with clause 3.13.4(c):*~~

(1) *load* forecasts at a range of probability of exceedance levels;

~~forecasts of the most probable *load* (excluding the relevant aggregated MW allowance referred to in subparagraph (4B)) plus *reserve* requirement (as~~

~~determined under clause 3.7.3(d)(2)), adjusted to make allowance for *scheduled load* and for *wholesale demand response units*, for each *region*;~~

(2) **[Deleted]** ~~forecasts of *load* (excluding the relevant aggregated MW allowance referred to in subparagraph (4B)) for each *region* with 10% and 90% probability of exceedence;~~

(3) **[Deleted]** ~~forecasts of the most probable *energy* (excluding the relevant aggregated MW allowance referred to in subparagraph (4B)) for each *region* and *trading day*;~~

(4) forecasts of the *available capacity* of individual *scheduled plant* ~~*generating unit*, *scheduled load*, *scheduled network service*~~ and *wholesale demand response units*; ~~aggregate *generating unit* availability (excluding the relevant aggregated MW allowance referred to in subparagraph (4B)) for each *region*;~~

(4AA) **[Deleted]** ~~aggregate capacity (excluding the relevant aggregated MW allowance referred to in subparagraph (4B)) for each *region*, after allowing for the impact of *network constraints*, that can be *generated* continuously, calculated by adding the following categories:~~

~~(i) the *available capacity* of *scheduled generating units* that are able to operate at the availability as notified to AEMO under paragraph (e)(1); and~~

~~(ii) the forecast *generation* of *semi-scheduled generating units* as provided by the *unconstrained intermittent generation forecasts*;~~

(4AB) **[Deleted]** ~~aggregate capacity (excluding the relevant aggregated MW allowance referred to in subparagraph (4B)) for each *region*, after allowing for the impact of *network constraints*, that cannot be *generated* continuously at the *available capacity* referred to in subparagraph (4AA)(i) due to specified daily *energy constraints*;~~

(4A) forecasts of *PASA availability* of individual *scheduled generating units*, *scheduled loads*, *scheduled network services* and *wholesale demand response units*; and ~~aggregate *generating unit PASA availability* (excluding the relevant aggregated MW allowance referred to in subparagraph (4B)) for each region;~~

(4B) **[Deleted]** ~~the aggregated MW allowance (if any) to be made by *AEMO* for generation from *non-scheduled generating systems* in each forecast:~~

~~(i) of the most probable *load* referred to in clause 3.7.3(h)(1); and~~

~~(ii) referred to in clauses 3.7.3(h)(2), (3), (4), (4A), (4AA) and (4AB);~~

(4C) **[Deleted]** ~~in respect of each forecast:~~

~~(i) of the most probable *load* referred to in clause 3.7.3(h)(1);~~

~~(ii) referred to in clauses 3.7.3(h)(2), (3), (4), (4A), (4AA) and (4AB),~~

~~a value that is the sum of that forecast and the relevant aggregated MW allowance (if any) referred to in clause 3.7.3(4B); and~~

(5) identification and quantification of:

(i) any projected *violations* of *power system security*;

(ii) any projected failure to meet the *reliability standard* as assessed in accordance with the *reliability standard implementation guidelines*;

(iia) any forecast *reserve* conditions under clause 4.8.4; and

(iii) **[Deleted]**

(iv) **[Deleted]**~~forecast *interconnector* transfer capabilities and the discrepancy between forecast *interconnector* transfer capabilities and the forecast capacity of the relevant *interconnector* in the absence of outages on the relevant *interconnector* only; and~~

(v) when and where *network constraints* may ~~become binding~~ limit ~~on the~~ *dispatch* of *generation* or *load*.

(i) If in performing the *short term PASA AEMO* identifies any projected failure to meet the *reliability standard* in respect of a *region* as assessed in accordance with the *reliability standard implementation guidelines*, then *AEMO* must use its reasonable endeavours to advise the *Jurisdictional System Security Coordinator* who represents a *participating jurisdiction* in that *region* of any potential requirements during such conditions to shed *sensitive loads*.

(j) **[Deleted]**~~*AEMO* must publish the procedure it uses for preparation of the *short term PASA*~~

10. Glossary

~~energy constrained scheduled generating unit~~

~~A *scheduled generating unit* in respect of which the amount of electricity it is capable of *supplying* on a *trading day* is less than the amount of electricity it would *supply* on that *trading day* if it were *dispatched* to its full nominated availability for the whole *trading day*.~~

~~energy constrained scheduled load~~

~~A *scheduled load* in respect of which the amount of electricity it can take in a *trading day*, if *normally off*, or it can *off-load*, if *normally on*, is *constrained*.~~

energy constraint

~~A limitation on the ability of a *generating unit* or group of *generating units* to generate *active power* due to the restrictions in the availability of fuel or other necessary expendable resources such as, but not limited to, gas, coal, or water for operating turbines or for cooling.~~

A limitation on the capability of a *scheduled generating unit* or *scheduled load* to produce or consume *energy* [in a specified period] at the level that would occur if the limitation were removed.

PASA availability

For a *scheduled generating unit*, *scheduled load* or *scheduled network service* in a given period, its available ~~The~~ *physical plant capability* (taking ambient weather conditions into account ~~in the manner described in the procedure prepared under clause 3.7.2(g)) of a *scheduled generating unit*, *scheduled load* or *scheduled network service* available in a particular period~~, and any additional ~~including any~~ *physical plant capability* that can be made available during that period within a given recall period in accordance with the *reliability standard implementation guidelines*.~~, on 24 hours' notice.~~

For a *wholesale demand response unit* in a given period, its the maximum available MW *wholesale demand response* ~~available in a particular period~~, including any *wholesale demand response* that can be made available during that period within a given recall period in accordance with the *reliability standard implementation guidelines*~~, on 24 hours' notice~~.

~~***short term PASA inputs***~~

~~The inputs to be prepared in accordance with clauses 3.7.3(d) and (e).~~

11. Transitional Provisions

[AEMO note: Transitional provisions may be needed to accommodate consultation (as required) and publication of the updated and expanded ST PASA procedure and related procedures and guidelines, e.g. RSIG, RLDG, spot market operations timetable to reflect the amending rule and ST PASA Replacement project implementation.]