



National Electricity Market Summer Readiness Compliance Bulletin

December 2020

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Introduction

The AER has published this compliance bulletin to outline to electricity market participants our expectations regarding compliance with a number of critical obligations under the National Electricity Rules (Electricity Rules).¹ While the bulletin has its genesis in assisting participants with summer readiness, it is our expectation that participants maintain focus on these obligations all year round.

The NEM is currently in a transition phase. The generation mix is changing, with an emergence of new technologies and the retirement of some traditional generation types. At the same time, the Electricity Rules are being adapted with urgency to ensure they keep pace with new and changing requirements around the security and reliability of the power system. It is important for the industry as a whole to be cognisant of this transition and to act to ensure that any associated risks are managed.

The issue of what is a risk to power system security is evolving over time and it is essential for participants to take a dynamic approach to assessing such risks. Participants should not view risks as occurring only under a fixed set of circumstances, for example, during peak periods as a result of supply-demand imbalances, and monitor only for those circumstances. Increasingly there have been threats to power system security at other times, such as during periods of low demand. Accordingly, the AER expects participants to take an adaptable approach to assessing and managing risk, taking into account numerous factors.

This bulletin sets out examples of what we consider to be best practice which we strongly encourage participants to adopt. Participants should review their practices in light of this information and update them as appropriate. We have also created a corresponding checklist to assist participants with their compliance.²

A key message of this compliance bulletin is that it is essential for participants to provide high quality and timely information to AEMO to ensure it can maintain a secure and reliable power system. This allows AEMO to identify and respond to any issues that arise, in the most effective way and at the least cost to consumers. An early identification of risks to supply allows AEMO to seek a market response, rather than intervening through the Reliability and Emergency Reserve Trader (RERT), issuing directions to generators, or more disruptive actions such as load shedding.³ In this regard, we provide detailed information in this compliance bulletin to assist participants' compliance with clause 4.8.1 of the Electricity Rules. It is also essential that participants regularly test their systems and equipment to ensure they are capable of performing as intended, particularly at times of heightened risks.

The Electricity Rules contains a number of obligations relating to the provision of information to AEMO, and how any changes should be advised. These obligations apply over varying

¹ This information is provided for guidance only and is not an exhaustive list that guarantees compliance. Market Participants will need to make a commercial decision about how best to operate, guided by private legal advice, where appropriate.

² Available on the AER's website.

³ AEMO may issue directions pursuant to Electricity Law section 116 and Electricity Rules clause 4.8.9.

time horizons – from real time to ten years in advance. The ongoing, overarching obligation to ensure all information is up to date is Electricity Rules clause 3.13.2(h), which requires Scheduled Generators, Semi-Scheduled Generators and Market Participants to notify AEMO of any changes to submitted information within the times prescribed in the timetable published by AEMO.⁴ As the trading period approaches, there will be greater forecast certainty as to the likely market conditions, plant capabilities and other relevant factors, and under this clause, participants should provide updated data to AEMO.

It is the responsibility of participants to understand all of their obligations under the Electricity Rules, many of which can attract civil penalties.⁵ We expect participants to have robust systems and processes in place to support compliance with their obligations. Where a Registered Participant has contracted a third party to undertake some or all of its operations, the responsibility for compliance remains with the Registered Participant. It is critical that the Registered Participant clearly sets out the roles of all parties involved to achieve compliance with its obligations, and has strong practices and procedures to monitor and ensure that those obligations are met.

We note that AEMO has published various binding operational procedures and documents that Registered Participants are required to observe in order to comply with their obligations under the Electricity Law and Rules.⁶ Awareness of the content of an obligation involves reviewing and understanding all relevant AEMO procedures and documents.

Market Participants often contact the AER seeking clarification of obligations of the Electricity Rules, including those relating to the provision of information. We encourage such communication, and also encourage participants to communicate with AEMO to clarify any aspects of meeting their obligations from an operational point of view when either the Rules or circumstances are unclear. These requests, along with our ongoing monitoring and compliance work, may inform future rule change proposals if we conclude that the current arrangements are not sufficient, clear or fit for purpose.

1. Electricity Rules clause 3.7.3 – Short term PASA

The Projected Assessment of System Adequacy (PASA) is the principal method of indicating to AEMO and Market Participants a forecast of the overall balance of supply and demand for electricity in the NEM. AEMO prepares PASA over two timeframes:

- medium term PASA (MT PASA) covers up to 36 months from the Sunday after the day of publication with a daily resolution (clause 3.7.2); and
- short term PASA (ST PASA) covers six trading days from the end of the trading day covered by the most recent pre-dispatch schedule with a half-hourly resolution (clause 3.7.3).

⁴ Available on [AEMO's website](#).

⁵ Under section 74 of the Electricity Law, if the AER has reason to believe that a civil penalty provision has been breached, we have the power to issue an infringement notice or institute civil proceedings.

⁶ See Electricity Rules clause 4.10.2(b).

Our summer readiness messaging focuses on PASA inputs in the short term. AEMO uses ST PASA results to identify lack of reserve (LOR) conditions to inform its decisions about whether market intervention is required to maintain a reliable and secure electricity system. AEMO will seek a market response from participants as a priority where possible, rather than intervening through its safety net mechanisms such as the RERT, issuing directions or Electricity Rules clause 4.8.9 instructions, or more disruptive actions such as load shedding.

Electricity Rules clause 3.7.3(e) requires a Scheduled Generator or Market Participant to submit the following ST PASA inputs:

- *available capacity* of each *scheduled generating unit, scheduled load* or *scheduled network service* for each *trading interval* under *expected market conditions*;
- *PASA availability* of each *scheduled generating unit, scheduled load* or *scheduled network service* for each *trading interval*; and
- *projected daily energy availability* for *energy constrained scheduled generating units* and *energy constrained scheduled loads*.

For the purposes of PASA, Semi-scheduled Generators are also required to submit plant availability to AEMO and Network Service Providers are required to submit outlines of planned network outages.⁷

AEMO uses the available capacity and daily energy availability submitted by participants to calculate regional reserve values. This process also takes into account 50% probability of exceedance (POE) demand forecasts, LOR threshold levels, and network constraints representing the system under two scenarios: with an intact system and with planned network outages. AEMO's main use for the PASA availability input in the ST PASA timeframe is to assist it to identify capacity offered by a Scheduled Generator in excess of that offered as available capacity to assist it to determine which units are, or could be, available for direction. AEMO does not use PASA availability in reserve calculations in the ST PASA timeframe.

The values submitted to AEMO must represent the participant's current intentions and best estimates. Because participants submit these inputs up to six days ahead of time, the AER expects participants to update their submissions to AEMO taking account of any changes to plant capabilities or other relevant information, to ensure that submitted values remain consistent with their current intentions and best estimates.

We are aware that many participants conduct daily and weekly team meetings across different areas of the business to discuss weather forecasts, plant availability, and other relevant factors. This forward planning promotes a common understanding of how the plant capability may be affected by the forecast market conditions and whether the ST PASA offers submitted to AEMO should be revised in response. We consider this to be good practice and recommend that such communications should be common practice for all businesses.

⁷ Semi-scheduled Generators' obligations are set out in Electricity Rules clause 3.7B(b) and Network Service Providers' obligations are set out in clause 3.7.3(g).

The ST PASA timeframe starts from the end of the trading day covered by the most recent pre-dispatch schedule, which means there is no overlap between this timeframe and the pre-dispatch timeframe. However, the AER's view of best practice is that participants should continue to update ST PASA inputs during the pre-dispatch period to reflect any relevant changes to these inputs. This will ensure that AEMO has the best information to inform its decisions about market intervention. This approach may also meet other Electricity Rules obligations, such as the requirement to notify AEMO of Scheduled Generator plant changes under clause 4.9.9, as discussed below.

Each of the three ST PASA inputs is discussed below.

1.1 Clause 3.7.3(e)(1) – Available capacity

Clause 3.7.3(e)(1) states that the available capacity value should be provided “under expected market conditions”. In 2010, the Australian Energy Market Commission (AEMC) conducted a rule change for amendments to PASA-related rules.⁸ With reference to available capacity provided under this clause, the AEMC's final determination stated “*the term “under expected market conditions” gives sufficient guidance to participants to take weather conditions into account when calculating availability.*” This has informed the AER's view of best practice that ambient weather conditions are a relevant factor in the determination of available capacity values.

Ambient weather conditions include factors such as air temperature, humidity, wind direction and speed, dust storms and equipment that can improve the maximum output capabilities during high ambient temperatures, such as evaporative cooling or fogging.

When considering weather forecasts, we recommend the use of localised weather forecasts rather than forecasts for the major regional load centre, where possible, as they should provide a more accurate representation of the likely conditions at the power station.

There are other factors that will be influential in determining a generator's available capacity, such as current fuel quality and the historical performance of a generator in similar conditions. Participants should have systems and processes in place to allow an informed view of their assets and provide an accurate and reliable estimate of their capability under the expected market conditions, and to update them as appropriate.

Participants should give consideration ahead of time to how market conditions will change across the trading intervals of the day and submit available capacity values with a corresponding profile. This sculpted profile would show the greatest degradation of plant capability during periods where ambient conditions are expected to be the most adverse. Submitting values as described may reduce intraday rebidding due to changes in ambient conditions.

⁸ The rule change documentation is available on the [AEMC's website](#).

1.2 Clause 3.7.3(e)(2) – PASA availability

AEMO compares PASA availability to available capacity to help identify additional capacity to inform it of which generating units are or may be available for direction.

We understand that a common approach to determining the value of PASA availability for the ST PASA process is to use available capacity as the basis of the PASA availability value and add any additional capability that can be made available on 24 hours' notice.

As required by clause 3.7.3(e), PASA availability values are based on current intentions and best estimates. We consider that the participant's submission should represent what it anticipates will be physically available given the information at hand when the submission is made (regardless of cost). If that information changes, the participant should update the PASA availability submission. Our view is that PASA availability is an indication of a generating unit's physical capability, that is, what could physically be made available given 24 hours' notice. We note that this does not mean what *would* be available for dispatch, but what capacity *could* reasonably be made available on 24 hours' notice.

We also consider that a Scheduled Generator or Market Participant should include capacity in PASA availability if it has a reasonable expectation that it could source fuel (and transport, if applicable) on 24 hours' notice. For example, amendments to the conditions of a participant's current fuel supply contracts (e.g. gas take-off rates) may be possible on 24 hours' notice. We understand from participants that where a direction from AEMO is issued (or even contemplated), short term fuel contracts can become more accessible. If there is a reasonable expectation that the fuel could be secured if the participant was under direction from AEMO, then the capacity should be included in PASA availability. Any risks to attaining this fuel can be communicated to AEMO through the rebid reason field or by direct contact with AEMO's control room. This view is consistent with AEMO's expectations.

However, we recognise that there are situations where there is no possibility or reasonable expectation that fuel will be available in 24 hours (for example, some hydro generators which have no access to additional water). In those instances, the capacity which would require that fuel for operation should not be included in PASA availability because the fuel supply is not reasonably expected to be replenished or become available on 24 hours' notice.

This approach differs in the MT PASA timeframe because there is a weekly energy constraint which applies to the daily PASA availability input. PASA availability in the medium term represents physical capability that can be made available on 24 hours' notice, subject to ambient weather conditions (as outlined in AEMO's MT PASA process description), and any fuel limitations would be captured by the weekly energy limits.⁹ If participants do not consider their individual situation will be accurately reflected within this framework, they should clarify their MT PASA entry with AEMO to allow AEMO to consider alternative methods of representation.

⁹ AEMO's MT PASA process description is available on [AEMO's website](#).

1.3 Clause 3.7.3(e)(4) – Daily energy availability for energy constrained plant

This obligation applies only to scheduled generating units and scheduled loads that are energy constrained: being those that have fuel to run, but not at maximum capacity across the entire trading day. The ST PASA process prioritises the allocation of fuel-constrained plant to periods of high demand or low generator availability until the energy limit is exhausted.

We remind participants that although fuel limitations have historically been considered most relevant to hydro generators, this is a technology-neutral obligation, and is relevant for other types of generator fuel sources (such as coal, fuel oil and gas). We therefore expect all generators to be mindful of applicable fuel limits and communicate them to AEMO through this process.

We expect participants to take a number of factors into account when determining their daily energy limited availability. These factors are specific to generator type but may include transportation, on-site storage, refuel rates, coal quality and gas pipeline linepack. Where a participant considers its access to fuel to be unconstrained and submits to AEMO under this clause accordingly, we expect the participant to monitor its fuel availability and update its submission to AEMO if this changes.

While AEMO's systems may change in the future, it is our understanding that presently a submission of zero for the ST PASA daily energy limit means that the generating unit is not constrained by fuel. This same interpretation applies where no value is submitted (i.e. a null entry). However, for MT PASA, a zero submission for the weekly energy constraint under clause 3.7.2(d)(2) means that the generating unit is fully constrained (i.e. has no fuel). We encourage participants to review their processes to ensure they are consistent with this approach.

As for other ST PASA inputs, the daily energy availability is based on current intentions and best estimates. Accordingly, we expect participants to base any submissions on what they would reasonably expect to occur given the current information and past experience, rather than a worst case scenario. For example, a gas generator should take planned transport outages into account when determining its daily energy limited availability, but it should not assume that there will be a pipeline issue affecting gas delivery, unless there is information to suggest this is the case.

We also expect participants to be mindful of any environmental requirements that affect the operation of their plant when determining daily energy availability values.

2. Clauses 3.8.17, 3.8.18, 4.9.6(a) and 4.9.7(a) – Informing AEMO of self-commitment and self-decommitment decisions

Clauses 3.8.17, 3.8.18, 4.9.6 and 4.9.7 outline how and when a Scheduled Generator should inform AEMO of its intentions for self-commitment and self-decommitment of a scheduled generating unit. Under clauses 3.8.17 and 3.8.18, a Scheduled Generator with a

nameplate rating of 30 MW or more must advise AEMO of its intentions to self-commit and synchronise or self-decommit and de-synchronise through PASA and pre-dispatch by submitting an amended available capacity profile. The generator must notify AEMO of any changes to self-commitment and self-decommitment decisions without delay.

Clauses 4.9.6(a)(1) and 4.9.7(a) further outline that for self-commitment and self-decommitment, the Scheduled Generator must confirm with AEMO the expected synchronising/de-synchronising time with at least one hour's notice, and update this advice five minutes before synchronising/de-synchronising, unless otherwise agreed with AEMO. In addition, for self-decommitment, clause 4.9.7(b) states that the Scheduled Generator must not de-commit a generating unit unless it has confirmed with AEMO a number of details relating to that de-commitment.

It is essential that Scheduled Generators provide (at least) the required one hour notice of self-commitment and self-decommitment to AEMO to ensure that AEMO can maintain system security.¹⁰ This assists AEMO to meet its system strength requirements which relate to the minimum number of synchronous generating units that must be online in each region at all times. Providing AEMO with the required notice, particularly for self-decommitment, avoids situations where AEMO must direct other generators to synchronise at short notice to meet these system strength requirements.

3. Clauses 3.8.20(g) and 4.9.8(b) – Compliance with dispatch as per pre-dispatch schedule and the latest generation dispatch offer

Clause 3.8.20(g) requires each Scheduled Generator, Scheduled Network Service Provider and Market Customer (who has classified scheduled load) and Market Participant (who has classified an ancillary service generating unit or load) to ensure that it is able to dispatch the relevant plant as required under the pre-dispatch schedule and, if necessary, to change the inputs via rebidding.

Clause 4.9.8(b) requires a Scheduled Generator to ensure that each of its scheduled generating units is at all times able to comply with the latest generation dispatch offer under Chapter 3 in respect of that generating unit.

We have previously outlined our expectations regarding compliance with clause 4.9.8(b) through investigations reports published following enforcement action and through our July 2016 Compliance Bulletin.¹¹ The expectations set out below are provided in addition to that previous commentary as they focus on compliance during times of extreme market conditions.

It is important that participants with responsibilities under these obligations have a practice of continually monitoring current output or plant capabilities and comparing that to the pre-dispatch schedule and the relevant dispatch targets from AEMO. Where the current

¹⁰ Under Electricity Rules clause 3.8.18(b), 2 days' notice is required for planned self-decommitment of slow start generating units.

¹¹ Compliance Bulletin No. 1 is available on the [AER's website](#).

capabilities are unlikely to meet the pre-dispatch schedule or target, the participant should inform AEMO of this through rebids and, if appropriate, also by contacting AEMO's control room directly. We also suggest monitoring actual ambient temperatures and comparing them to the forecasts upon which offers were based, to determine whether offers for the remainder of the day should be updated.

We consider the use of real-time systems to monitor compliance with this obligation to be best practice. For example, an automatic system to compare a unit's actual output to its current dispatch target, and activate an alarm if output is not in accordance with target. The alarm would induce the plant operator or trader to investigate further and, if necessary, to submit a rebid to AEMO. This may be an effective way of achieving compliance with this obligation.

During extreme weather conditions, when the plant may be more likely to derate, participants should ensure communications between operations and trading staff are clear and frequent. We understand that during these times the output capability of generators may not change in a linear or predictable manner in response to changes in ambient conditions, or the generator's ability to operate at full capacity for extended periods may be diminished. Because of these issues, it is increasingly important for plant operators to monitor real-time generator output against targets and communicate any changes in capability due to ambient conditions to traders. Traders should then provide updated information to AEMO about current plant capabilities.

4. Clause 4.9.8(d) – Compliance with the latest market ancillary service offer

For providers of ancillary services, clause 4.9.8(d) requires a Market Participant which has classified a generating unit or load as an ancillary service generating unit or an ancillary service load, as the case may be, to ensure that the ancillary service generating unit or ancillary service load is at all times able to comply with the latest market ancillary service offer for the relevant trading interval. Clause 3.8.7A(l) requires the values in a market ancillary service offer to represent the technical characteristics of the ancillary service generating unit or an ancillary service load.¹² Furthermore, clause 3.8.7A(m) requires any rebids of the values in a market ancillary service offer to represent technical characteristics at the time of dispatch.

There are two types of frequency control ancillary services (FCAS): contingency and regulation. As a general principle, it is important that contingency FCAS services are delivered when required as they form a key part of the safety net measures to ensure AEMO can meet and maintain power system security. It is important that Market Participants offering contingency FCAS services appropriately test their equipment and perform due diligence to ensure they are capable of meeting AEMO's Market Ancillary Services Specification (MASS) when their offer is called upon. With respect to contingency FCAS services, participants are paid to be available *if needed*. While the requirement to actually

¹² These values are set out in Electricity Rules clause 3.8.7A(j) and are the: response breakpoint, upper and lower enablement limits and response capability.

deliver may be relatively infrequent, participants could receive large payments for a service they may have never been able to provide, which is only then apparent when not delivered. There are limited opportunities to discover plant issues other than through the occurrence of actual events, unless the participant carries out due diligence, real time monitoring and/or appropriate testing. In addition to reviewing actual responses following an event, we recommend that participants test individual elements of control systems or processes in isolation to provide a reasonable level of assurance that the overall response is likely to perform effectively when required.

Furthermore, if Market Participants who provide market ancillary services are making changes to plant, we expect them to be cognisant of any implications these changes will have on their ability to provide the services that they have committed to provide. These participants should carry out due diligence when dealing with the Original Equipment Manufacturer to ensure that new plant, or plant changes, have undergone appropriate testing against any applicable Australian Standards including your generator performance standards (GPS), noting that these may not be the default settings for the plant.

We expect that part of the participant's obligations for due diligence of testing and monitoring equipment, especially with respect to complying with clause 4.9.8(d), would be to monitor the performance of the equipment or load and self-report any identified issues to AEMO and/or the AER in a timely manner. The prompt identification of such issues will be achieved by having effective processes for communication between operations and trading staff.¹³

For example, clause 3.11.2(i) states that AEMO may from time to time require a Registered Participant which provides a market ancillary service to demonstrate the relevant plant's capability to provide the market ancillary service to the satisfaction of AEMO according to standard test procedures. A Registered Participant must promptly comply with a request by AEMO under this clause.

5. Clauses 3.11.2(f) and (h) – Market ancillary services

Clause 3.11.2(f) requires a Market Participant which has classified a generating unit as an ancillary service generating unit or a load as an ancillary service load to install and maintain, in accordance with standards developed by AEMO, monitoring equipment to monitor and record the response of the relevant unit or load to changes in the frequency of the power system. AEMO's MASS sets out the relevant standards.¹⁴ Under clause 3.11.2(h), AEMO may request a report on how the relevant facility responded to a particular change in the frequency of the power system, and the Market Participant must provide this report promptly, and no more than 20 business days after AEMO's request.

Market Participants must have functioning data systems in place to ensure they capture relevant ancillary service data and are able to provide this data to AEMO on request. We encourage all providers of these services to audit their data systems on a regular basis to confirm that they capture the required data and would facilitate the provision of this data to

¹³ For example, as suggested in the sections of this compliance bulletin relating to clauses 4.8.1 and 4.9.2(d).

¹⁴ Available on [AEMO's website](#).

AEMO if requested. Market Participants should also ensure that the data system's storage capacity is adequate to capture the required information, and increase this if it is insufficient. The MASS specifies that Market Participants are to retain recordings for at least 12 calendar months from the Frequency Disturbance Time.¹⁵

As mentioned above in the guidance for clause 4.9.8(d), Market Participants should have testing and compliance programs to support their ability to comply with their market ancillary services' offers. While clauses 3.11.2(f) and 3.11.2(h) are not civil penalty provisions, the AER considers it important that this information is available to AEMO for its analysis and planning.

6. Clause 4.8.1 – Advising AEMO of threats to the secure operation of the power system

This obligation requires a Registered Participant to promptly advise AEMO or a relevant System Operator at the time that the Registered Participant becomes aware, of *any circumstance* which *could* be expected to adversely affect the secure operation of the power system or any equipment owned or under the control of the Registered Participant or a Network Service Provider [emphasis added]. Importantly, this obligation requires participants to notify AEMO of potential risks before they eventuate, not just after.

“System Operator” is defined as “[a] person whom AEMO has engaged as its agent, or appointed as its delegate, under clause 4.3.3 to carry out some or all of AEMO’s rights, functions and obligations under Chapter 4 of the Rules and who is registered by AEMO as a System Operator under Chapter 2”. AEMO has signed a delegation instrument with the Transmission Network Service Provider (TNSP) for each region under this clause, thereby delegating some of its rights, functions and obligations to these participants.¹⁶ As a result, Distribution Network Service Providers (DNSPs) will communicate with TNSPs, as the relevant System Operators, in relation to power system security issues in accordance with agreed communication protocols.

We note that clause 4.8.1 applies to all Registered Participants, which includes all classes of generators, as well as Network Service Providers and (market) Customers. Compliance with this obligation at all times is critical to the secure operation of the market, as it ensures that AEMO can respond to any threats to system security in a timely and appropriate manner.

We provide guidance on various aspects of clause 4.8.1 below.

6.1 Information to be communicated to AEMO under clause 4.8.1

There is a wide range of potential risks to power system security, and the issue of what constitutes a risk to power system security is evolving. Low demand is an emerging risk, with recent years showing a significant increase in intervention required to maintain the network in a secure operating state at times when there is both high asynchronous generation and

¹⁵ As defined in the MASS.

¹⁶ Available on [AEMO's website](#).

low demand. We consider this underlines the importance of participants being adaptable to evolving risks, and not focusing too narrowly on easily quantifiable or identifiable risks.

Registered Participants are best placed to observe and understand local conditions at their own plant or assets, and how those conditions may affect their operation. If a participant's plant has historically reacted a certain way under certain circumstances, and those circumstances arise, the participant should contact AEMO to communicate that risk.

While a participant may consider that an event may have only a limited impact on power system security, when combined with other events there may be a greater impact. AEMO has visibility of the whole power system, including information about other events that may have occurred, and will be best placed to assess the impact of the event. For this reason, participants should communicate all events promptly.

We understand that most participants contact AEMO's control room on a regular basis to discuss threats to their equipment or to power system security. While the list of these types of threats is not exhaustive, we understand that participants commonly notify AEMO in relation to the following circumstances:

- unplanned outages (including plant trips) and planned outages;
- external environmental conditions, including extreme weather events. Knowledge of forecast conditions may be obtained through engagement with state emergency service agencies and the Bureau of Meteorology. We remind Registered Participants that any communications with these agencies should be relayed to AEMO if the relevant information indicates a risk to power system security or the proper functioning of equipment;
- other circumstances that could result in equipment owned or under the control of a participant not operating at full capacity or as expected, for example:
 - high ambient temperatures;
 - routine plant tests that may cause disturbances;
 - supply issues, including potential fuel shortages; and
 - plant settings that may affect how plant reacts to power system events.
- circumstances that have put plant on a single point of failure, or where there is a plant issue which puts a unit at a higher risk of trip.
 - We have observed that during extreme weather events, some generators will rebid to reduce the available capacity of their units in efforts to protect them from an identified risk of trip. Reducing generator availability can be an effective way for generators to manage such risk. However generators should also contact AEMO to notify it of the risk at the earliest possible time. This will assist AEMO to carry out any required contingency planning to respond to the possibility of the risk being realised.

We note that AEMO is monitoring the entire power system and may not see the information participants submit immediately. Where conditions in the market are tight, or the issue a participant is informing AEMO of is time sensitive, it would be sensible to verbally inform

AEMO's control room operators. Maintaining direct contact allows AEMO to obtain any further details it needs immediately. We consider that, when in doubt about whether a circumstance falls under the ambit of clause 4.8.1, it is best practice to contact AEMO.

6.2 Systems and processes for remaining informed

We recommend that Registered Participants establish systems and processes for ensuring they remain informed of circumstances which could be expected to pose risks to equipment or power system security, including:

- 24/7 control or monitoring of Supervisory Control and Data Acquisition (SCADA) data to maintain awareness of the state of security of the power system and/or functioning of their equipment;
- monitoring of weather forecasts;
- alarms and alerts to inform internal operational and trading staff of issues needing attention; and
- regular discussion between internal operational and trading staff.

We consider it is best practice for participants to continually monitor local conditions in the context of market information and to consider the implications these may have on their plant, given other factors they are aware of. We also suggest that participants analyse how their plant has reacted to an event and use this as a lead indicator as to how it may react in the future.

Training for operators and traders should be flexible enough that it allows them to adapt to new and emerging risks within the power system, and be able to communicate effectively any information in relation to these risks/threats to AEMO. Participants should regularly review their training programs to identify potential gaps or improvements.

Where a Registered Participant has contracted a third party to undertake some or all of its operations, the responsibility for compliance remains with the Registered Participant. In relation to clause 4.8.1, the AER expects all participants to maintain a holistic awareness and understanding of risks, incorporating historical plant performance, and communicate these risks to AEMO where relevant.

6.3 Power System Security Guidelines and other operating procedures and documents

AEMO's Power System Security Guidelines (PSSG) provide important guidance on what information AEMO requires when considering whether to reclassify risks to the power system as credible.¹⁷ We recommend that participants use the PSSG as an input to their internal procedures and guidelines for assessing risks to power system security and communicating with AEMO.

¹⁷ Available on [AEMO's website](#).

As noted above, we expect that participants will observe all documents and guidelines published by AEMO pursuant to the Electricity Law and Rules, including the PSSG. We also note that the following AEMO operating procedures, documents and notices may be useful in informing participants' determination of what information to provide to AEMO around risks to power system security or its equipment:

- the Regional Power System Operating Procedures (relevant to Network Service Providers), which document the operational responsibilities and operating boundaries between AEMO, TNSPs and DNSPs for the purpose of managing power system security in a particular region;¹⁸
- power system emergency management procedures, including the Power System Emergency Management Plan and Victorian Energy Emergency Communication Protocol;¹⁹
- AEMO's Outage Assessment document, which provides more detail about AEMO's process for assessing and responding to planned and unplanned outages;²⁰
- the Power System Data Communication Standard, which sets out the standards with which Network Service Providers, Generators and Customers must comply when transmitting data to and from AEMO;²¹ and
- market notices, including LOR and abnormal conditions notices – reviewing and responding to these notices as appropriate is an essential part of monitoring what is happening in the market.²²

6.4 Clause 4.8.1 and other obligations

We note that information provided pursuant to other obligations may also be relevant to achieving compliance with clause 4.8.1. For example, the provision of ST PASA submissions under clause 3.7.3 or amending dispatch bids or offers under clause 3.8.22. However, we do not consider it sufficient for a participant to rely solely on processes relating to other obligations when determining what information it should provide to AEMO under clause 4.8.1. Clause 4.8.1 is a distinct obligation that covers any threats to the secure operation of the power system or relevant equipment.

7. Clauses 4.9.9, 4.9.9A, 4.9.9B, 4.9.9C and 4.9.9D – Plant and availability changes

Clause 4.9.9 requires a Scheduled Generator to notify AEMO without delay of any event which has changed, or is likely to change, the operational availability of any of its scheduled generating units, whether synchronised or not, as soon as it becomes aware of the event.

¹⁸ These documents are not publically available.

¹⁹ Ibid.

²⁰ Available on [AEMO's website](#).

²¹ Available on [AEMO's website](#).

²² Available on [AEMO's website](#).

Clauses 4.9.9A, 4.9.9B, 4.9.9C and 4.9.9D contain equivalent requirements for other participants in relation to their scheduled network services, market ancillary services, inertia support activities, inertia network services and system strength services, as relevant.

Clause 4.9.9C and 4.9.9D came into effect on 1 July 2018 following a review into power system strength. These obligations recognise the importance of inertia and system strength services in maintaining power system stability, particularly with the changing generation mix providing more non-synchronous generation which has led the power system to have less inertia and be weaker than was the case with the traditional prevalence of synchronous generation.

Each of these clauses places a positive obligation on the relevant participant to notify AEMO of changes. While we understand that AEMO's control room may contact participants seeking additional real time plant and service availability information, participants should not rely on such contact as a means of meeting the requirements of these clauses.

Where the event has implications (realised or potential) for the availability of a generating unit or service on an ongoing basis, such as a long term outage of a unit or impairment of network equipment, the participant should discuss this with AEMO. This will achieve a common understanding of the issue and how any subsequent events may further affect the availability of the unit or service.

We provide further guidance relating specifically to clause 4.9.9 below.

7.1 Clause 4.9.9 – Scheduled generator plant availability changes

In relation to clause 4.9.9, updating the operational availability of plant that is not synchronised is important as this plant may still be dispatchable, or able to be directed to generate and it is therefore important for AEMO to be informed of changes to its operational availability.

The factors which will impact the operational availability of a generator will be different for each generator type. We expect participants to be cognisant of the factors that affect the operational availability of their individual plant and have systems in place to monitor those factors to ensure that any changes in operational availability are identified and notified to AEMO in a timely manner. In addition to manual monitoring practices, this may include having automated systems to actively monitor influential factors such as fuel availability and ambient conditions and alert the relevant staff to any changes.

Our view is that best practice would involve taking different approaches to notifying AEMO depending on whether the event has already changed the operational availability of a generating unit, or whether there is a future likelihood that the operational availability will change. We consider that this approach may also achieve compliance with other obligations, such as clauses 3.7.3(e), 4.8.1 and 4.9.8.

- If the event has already changed the operational availability of the scheduled generating unit, a Scheduled Generator should submit rebids to AEMO updating its offers, ST PASA, MT PASA or fuel constraint parameters (if appropriate) to reflect the revised capability of the unit.

We consider that updating ST PASA inputs during the pre-dispatch period in response to changes in operational availability may be a way to achieve compliance with clause 4.9.9 (and 3.13.2(h)). Doing so will convey the most accurate unit capabilities over the current day to AEMO and allow AEMO to perform its intraday reserve calculations with current plant capabilities.

- If the event is likely to change the operational availability of the scheduled generating unit in the future, for example if the event has increased the risk of a unit trip, the Scheduled Generator should inform AEMO's control room immediately. However, there should be no update to generator availability information through updates to offers or PASA parameters at that time, as there has not been a realised change in the unit's capability.

8. Clause 4.9.2(d) – Personnel to receive and immediately act upon dispatch instructions

This obligation requires a Scheduled Generator or Semi-Scheduled Generator, with respect to its generating units that have an availability offer of greater than 0 MW (whether synchronised or not), to ensure that appropriate personnel are available at all times to receive, and immediately act upon, dispatch instructions issued by AEMO. Similar obligations are imposed on Market Customers that have submitted dispatch bids for scheduled loads and Market Participants that have submitted market ancillary services offers, noting the obligation is with respect to appropriate personnel or electronic facilities.²³

We note that the obligation applies 'at all times' and we expect generators to have sufficient resources available to control and direct generating units to meet dispatch instructions. This is particularly important during a system security event, which can occur at any time, requiring increased communication with AEMO. While generation assets may be operated by third parties under contract, this obligation falls on the Registered Participant for the asset and it is the responsibility of the Registered Participant to ensure that its agreements with such third parties support compliance with it.

We understand that personnel may be responsible for controlling numerous generation units at any time. Businesses need to assess whether additional equipment or staff are required to effectively manage the fleet during extreme market events where there may be an increased number of simultaneous changes or a need for increased monitoring. We consider it good practice for generators to have contingency plans in place, whereby additional personnel may be called upon at short notice to assist with operations during market events. Similarly, when preparing for future market events (for example, as notified by AEMO's market notices), participants should include a consideration of whether additional personnel will be required and plan accordingly, in advance of the market event occurring, rather than waiting until the event occurs.

There should also be effective communication between various personnel (for example, between plant operators and trading staff) so that the roles and responsibilities for operating equipment in response to AEMO's dispatch instructions are clear. Furthermore, while not

²³ Clauses 4.9.3(b) and 4.9.3A(c) respectively. Similar obligations are imposed on scheduled network service providers under clause 4.9.2A(b) and non-market ancillary service (NMAAS) providers under clause 4.9.3A(d).

required under the Electricity Rules, the AER considers that all calls between traders and AEMO's control room should be recorded as best practice.

9. Clause 4.11.3 – Power system voice/data operational communication facilities

Clause 4.11.3 requires a Network Service Provider, System Operator, Distribution System Operator, Generator or Market Participant to advise AEMO of each nominated person for the purposes of giving or receiving operational communications in relation to each of its facilities. The details to be provided for each nominated person include title, two telephone numbers, a facsimile number and an email address.

This clause builds in sufficient redundancy to ensure that AEMO is able to contact the relevant person, even when there may be a fault with one of the nominated contact methods. It also outlines how communications systems must be maintained and timeframes within which identified telephone system faults must be repaired.

For the purposes of this clause, an operational communication is a communication concerning the arrangements for, and actual operation of, the power system in accordance with the Electricity Rules. Therefore, we consider that it is crucial that the persons who are nominated to AEMO under this clause have the technical capability to give and receive these communications in relation to the facility. It would not be sufficient for contact details to be provided for a person who would not be able to carry out the action which AEMO is requesting. That is, the assigned person should not be a corporate or administrative representative of the business, but rather an operational staff member with technical operating capabilities.

We also remind participants to ensure that contact information provided to AEMO is kept up to date to ensure that AEMO is able to contact the relevant person without delay, if required. This is especially relevant for newly registered participants who, under this clause, may have provided contact details for a third party who was involved in the commissioning of the generation asset, but is no longer involved once the plant is operational. In this case, contact details for the facility operators should be provided once the commissioning is complete.

10. Clause 4.15 – Compliance with generator performance standards

Generators are required to implement and maintain effective compliance programs in accordance with clause 4.15 of the Electricity Rules. Compliance with the GPS is fundamental to AEMO's ability to safely and reliably operate the power system. Non-compliance with certain performance standards may materially increase the risk of major power system incidents.

Clause 4.15(f) requires generators to immediately notify AEMO of any breaches or likely breaches of a performance standard. This is done by completing and submitting to AEMO a

*Notice of Non-compliance with Registered Performance Standards.*²⁴ This immediate notification allows AEMO to assess the implications of the non-compliance on the power system and, where necessary, take actions to ensure power system security can be maintained.

The AER published an Information Bulletin in 2013 to promote the GPS compliance framework.²⁵ We proactively monitor generators' compliance quality assurance systems by conducting audits of their compliance practices. The Australian Energy Market Commission's Reliability Panel reviews the template for generator compliance programs from time to time. We expect generators to follow the progress of these reviews and update their compliance programs in accordance with any changes to the template.

Non-compliance against the registered GPS can occur during the commissioning phase of the plant, model validation simulation/tests, GPS compliance monitoring process and due to the defects of the plant over time. The AER liaises closely with AEMO to ensure that the generator non-compliances are managed efficiently and resolved as soon as practicable.

During extreme weather events or times of high demand, when the power system is running near or at full capacity, any reductions in the performance levels of generators, especially if coincident with a network event, can lead to cascading failures in the power system. Participants must ensure compliance arrangements are fully effective at all times. We encourage generators to regularly review their compliance with generator performance standards under clause 4.15. This may involve updating the relevant compliance programs and documentation to ensure they are up to date.

We also recommend that generators review their testing requirements and, where possible, prioritise testing ahead of peak periods to avoid inflexible outages due to plant issues. Participants should evaluate the effectiveness of their testing processes and procedures on an ongoing basis and update them when any potential improvements are identified.

²⁴ Available on [AEMO's website](#).

²⁵ Available on the [AER's website](#).