Contingency Frequency Control Ancillary Services (FCAS) Compliance Bulletin

October 2022

AUSTRALIAN ENERGY REGULATOR

Inquiries about this publication should be addressed to:

Australian Energy Regulator
GPO Box 520
Melbourne VIC 3001
Tel: 1300 585 165
Email: AERCompliance@aer.gov.au

AER reference: 65492/12946144

Amendment record

Version	Date	Pages
1	February 2022	10
2	October 2022	11

Contents

1 Introduction

This compliance bulletin outlines for electricity market participants[1] (participants) our expectations regarding compliance with a number of critical obligations relating to frequency control ancillary services (FCAS) under the National Electricity Rules (Electricity Rules).

FCAS is one of the mechanisms used by the Australian Energy Market Operator (AEMO) to manage power system security. It is important that FCAS is delivered when required as it forms a key part of the safety net measures to ensure AEMO can achieve and maintain power system security.

There are currently two types of FCAS – contingency and regulation:[2]

- Contingency FCAS is procured to manage frequency recovery and return the frequency back within the normal operating frequency band (50 +/- 0.15 Hz), following a contingency event affecting the power system (such as the loss of a generator, load or network element). These services are delivered automatically by enabled providers that have bid into the National Electricity Market (NEM) to deliver contingency FCAS in response to any frequency deviation outside the normal operating frequency band that may occur.[3]
- Regulation FCAS is procured to manage small perturbations around 50 Hz when frequency is within the normal operating frequency band. Regulation FCAS is controlled by AEMO's Automatic Governor Control (AGC) system, which sends pulses to regulation-enabled generators to increase or decrease output every four seconds.

While this bulletin primarily focuses on contingency FCAS, many of the themes are applicable to other frequency control services. Participants should ensure they have robust systems and processes in place to support compliance with regulation FCAS offers and dispatch instructions at all times.

Section 3 of this compliance bulletin sets out examples of what we consider to be good or expected practice which we encourage participants to adopt. Participants should review their

[1] The contingency FCAS obligations variously refer to "Market Participants" and "Registered Participants". We use the generic term "participants" except where describing the specific content of Electricity Rules obligations, or for the sake of clarity.

[2] The term "market ancillary services" refers to the services identified in clause 3.11.2(a) of the Electricity Rules: regulation raise and lower, fast raise and lower, slow raise and lower, and delayed raise and lower. The fast, slow and delayed services are referred to as "contingency FCAS". We use this term for convenience throughout this compliance bulletin. In October 2023, when the Fast Frequency Response Market Ancillary Service Rule commences operation, the "market ancillary services" definition will be extended to include two new market ancillary services: very fast raise and lower. The very fast raise and lower services will be types of "contingency FCAS" and will be procured to manage major frequency deviations.

[3] Clause 1.2.1 of the Market Ancillary Service Specification (Version 8.0) currently provides that the normal operating frequency band is 50 +/- 0.15 Hz for the purpose of providing contingency FCAS. This is different from the more general Electricity Rules definition of "normal operating frequency band".

practices in light of this information and update them as appropriate. This bulletin is not, however, a substitute for any provisions of the Electricity Rules, or an exhaustive statement of the AER's expectations. It is the responsibility of participants to understand and comply with all of their FCAS obligations under the Electricity Rules, some of which can attract substantial civil penalties, and to make decisions about how best to operate, guided by private legal, commercial advice, where appropriate.[4]

Participants sometimes contact the AER seeking clarification of Electricity Rules obligations relating to the provision of contingency FCAS. We encourage such communication, which along with our ongoing monitoring and compliance work, will assist us to determine whether further AER guidance may be appropriate or to inform our policy position. Seeking clarification is not, however, a substitute for independent legal advice.

This document does not set out specific performance parameters or particular technical requirements for participants to comply with when providing contingency FCAS. AEMO's Market Ancillary Service Specification (MASS)[5] is the fundamental source of such requirements and participants must familiarise themselves with the requirements of the MASS. We encourage participants to communicate with AEMO to clarify any aspects of meeting their contingency FCAS obligations from an operational point of view, including in relation to MASS requirements.

[4] Under section 74 of the National Electricity Law (Electricity Law), if the AER believes on reasonable grounds that a civil penalty provision has been breached, we have the power to issue an infringement notice, and Part 6 of the Electricity Law provides for the AER to institute civil proceedings.

[5] Available on AEMO's website. AEMO amends the MASS from time to time through a public consultation process. Participants must be compliant with the version in force.

2 Relevant Electricity Rules

This section summarises some of the key obligations relating to contingency FCAS offers and compliance with dispatch instructions. Participants should familiarise themselves with the obligations as described in the Electricity Rules (and as amended, from time to time).

Compliance with market ancillary service offers

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 4.9.8(d) applies to all FCAS offers and is a tier 1 civil penalty provision.[6]

Clause 3.8.7A prescribes the requirements that apply to all market ancillary offers, including the content to be included in contingency FCAS offers and rebids. In particular:

- Clause 3.8.7A(k) requires an Ancillary Service Provider that submits a market ancillary service offer to ensure that the ancillary service generating unit or ancillary service load, as the case may be, is at all times capable of responding in the manner contemplated by the MASS.
- 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 ancillary service load.[7] Furthermore, clause 3.8.7A(m) requires rebids of the values in a market ancillary service offer to represent technical characteristics at the time of dispatch. These requirements are both tier 1 civil penalty provisions.

Participants should familiarise themselves with the AER's Rebidding and Technical Parameters Guideline, which details our expectations for bidding and rebidding technical parameters, including those referred to in clause 3.8.7A. Relevantly, the Guideline provides that, where the technical parameters of market ancillary service offers are rebid, the reason provided should relate directly to the technical characteristics that have altered since the initial market ancillary service offer.

Compliance with dispatch instructions

Clause 4.9.8(a) requires a Registered Participant to comply with a dispatch instruction given to it by AEMO unless to do so would, in the Registered Participant's reasonable opinion, be a hazard to public safety or materially risk damaging equipment. Clause 4.9.8(a) applies to all dispatch instructions issued by AEMO, including those for ancillary services such as FCAS, and is a tier 1 civil penalty provision.

---

[6] More information regarding the penalty tier system can be found on the AER's website.

[7] The values are set out in clause 3.8.7A(j) of the Electricity Rules and are the response breakpoint, upper and lower enablement limits, and response capability.

Clause 4.9.3A(a) provides that AEMO may at any time give a dispatch instruction to a Market Participant which has classified one or more of its generating units or loads as an ancillary service generating unit or ancillary service load. Clause 4.9.3A(c) requires a Market Participant which has so classified a generating unit or load, and submitted an offer in respect of that unit or load, to ensure that appropriate personnel or electronic facilities are available at all times to receive and immediately act upon dispatch instructions issued to the Market Participant by AEMO. Clause 4.9.3A(c) is a tier 1 civil penalty provision.

The AER's Compliance Bulletin #1 details our general expectations for compliance with dispatch instructions, offers and bids.

Other relevant obligations

Clauses 2.2.6 and 2.3.5 set out requirements for Market Generators and Demand Response Service Providers/Market Customers that intend to participate in FCAS markets. Under these clauses, AEMO may impose such terms and conditions as AEMO considers necessary to ensure that the provisions of the Electricity Rules applying to market ancillary services can be met.[8] Participants must comply with any such terms and conditions imposed by AEMO.[9]

[8] Electricity Rules, clauses 2.2.6(f) and 2.3.5(f).

[9] Electricity Rules, clauses 2.2.6(g)(1) and 2.3.5(g)(1) – these are both tier 1 civil penalty provisions.

3 Compliance approach – AER expectations

At a high level, the AER expects participants to take the following approach to achieving compliance with Electricity Rules obligations:

- have a clear understanding and maintain visibility at all times of their plant's contingency FCAS capabilities, including any plant settings which impact on capabilities;
- be aware of the types of plant changes that may impact on the delivery of contingency FCAS, and review FCAS capabilities after significant plant changes including via testing and/or monitoring;
- regularly assess the actual frequency response of plant that AEMO has enabled to provide contingency FCAS whenever the system frequency deviates from the normal operating frequency band, or otherwise specified in the MASS;
- have systems and processes in place to ensure compliance with contingency FCAS obligations when engaging contractors or business partners; and
- familiarise themselves with the requirements of the MASS and ensure they observe them.

We elaborate on these points below.

3.1 Plant settings and bidding practices

3.1.1 General principles

Participants should have a clear understanding of their contingency FCAS capabilities and any plant settings or modes which impact on capabilities. In particular, participants should have systems and processes in place to monitor relevant plant settings and ensure high quality communication between traders and plant operators to ensure offers reflect actual capabilities at all times.

Plant settings and modes can take a number of different forms and may prevent, enable or partially constrain frequency response. Participants should ensure traders and operators understand the extent to which these settings and modes may impact on contingency FCAS capability under all relevant plant and system conditions. Each plant can have unique settings; it is good practice to confirm the details of settings and modes with the original equipment manufacturer where possible.

We note that clause 4.9.8(d) requires each contingency FCAS provider to ensure its plant can comply with the latest contingency FCAS offer "at all times" and we expect all participants to have sufficient resources available to monitor and promptly act on changes in plant settings or modes whenever they offer the plant for contingency FCAS. To minimise information gaps, we expect that participants will have systems and processes for ensuring that trading and operational staff on shift promptly communicate changes in plant settings or modes to each other, as well as with incoming trading and operational staff during shift handovers.

We are aware that some participants have a process in place whereby operational and trading staff receive automated alerts if there is a plant setting change. We consider this to be good practice and encourage such alerts to be put in place where possible.

Reliance on a single practice or process to maintain visibility of relevant plant settings is high risk. We consider using a range of complementary practices and systems to be optimal.

3.1.2 Distributed energy resources and contingency FCAS

Recently, a number of participants have registered distributed energy resources (DERs) for participation in the contingency FCAS markets. Examples of DERs include:

- small/medium scale generation assets such as solar photovoltaic (PV);
- energy storage that can store and deliver energy such as behind-the-meter batteries; and
- loads that are flexible and controllable in the times they operate.

These participants often aggregate a large number of individual assets (sometimes in geographically distinct locations) so that contingency FCAS response is dependent on the performance of these assets as a whole and sensitive to local distribution network conditions and capability more generally.

DERs provide additional options for frequency control in the NEM and allow residential and small business customers to participate in contingency FCAS markets. However, unlike other types of registered contingency FCAS, the participant will often need to monitor the performance of a large number of assets, each with their own settings and modes, to ensure offers for the aggregated unit reflect the combined capabilities of the individual assets at all times.

As DERs are often embedded within a customer's facility, detailed knowledge of asset performance and continuous awareness of contingency FCAS capability may be difficult. Participants should ensure that all parties (including asset owners and customers) understand the DER's capability and communicate changes in on-site conditions (or any other changes) that may affect the ability of their individual asset to contribute to the contingency FCAS response. It is good practice for participants to ensure there is a buffer between the amount of contingency FCAS they offer for the aggregated unit/s and the expected availability, to account for the uncertainty in the performance of a large number of disaggregated sites.

3.1.3 Automated bidding systems

Some participants have introduced automated bidding systems with some level of oversight from technical or operational staff. These automated systems submit or update contingency FCAS offers to AEMO based on plant conditions (e.g. how much charge is left in a battery) and actual and forecast market indicators (such as NEM supply/demand and price).

We note there are some benefits from automated bidding systems, as they can be more timely and are less prone to human error when synthesising plant information to generate and submit contingency FCAS offers. However, the risk of non-compliance due to system error is higher than for manual bidding systems. We expect technical and operational staff to

maintain adequate manual oversight to ensure that the generating unit or load can comply with the latest market offer at all times and that the rebidding reasons are appropriately specific. This may involve manual intervention where staff observe potential or actual non-alignment between contingency FCAS offers and capability.

Participants utilising automated bidding systems must ensure that all offers and rebids comply with overarching obligations around provision of high quality and accurate information to AEMO and the market. These include ensuring that:

- offers and rebids are not false or misleading;
- a brief, verifiable and specific reason for each rebid is provided to AEMO in line with the AER's Rebidding and Technical Parameters Guideline; and
- contemporaneous records are kept as required.

3.2 Plant changes

Participants should ensure they have in place sound change management processes for any significant or non-routine plant changes that may affect contingency FCAS performance. It is important to note that plant changes are broader than mechanical changes to physical plant and include software and firmware upgrades to control systems or applicable settings.

Participants' change management processes should relevantly include requirements for:

- specific consideration of potential impacts on contingency FCAS performance as part of the planning and initiation process;
- where potential impacts are identified, detailed consideration of all the steps in the relevant testing regime required for accurate measurement of contingency FCAS performance;
- remediation of any issues identified during testing prior to offering contingency FCAS (noting that participation in contingency FCAS markets is voluntary);
- training of relevant operational and trading staff on how the plant changes may impact on contingency FCAS performance; and
- seeking approval from AEMO and the relevant Network Service Provider where changes affect performance against the participant's registered Generator Performance Standards (GPS).

Testing of contingency FCAS may occur in a number of forms depending on the type of generation technology:

- For generators with mechanical governor response, simulated frequency injections cannot be used, so participants often rely on real-time data or monitor performance following return to service.
- Other types of plant have control systems that sense frequency and provide an input to the relevant control system. This allows simulated frequency injections to be performed to measure contingency FCAS performance.

Participants should ensure that any testing is suitable for the type of technology used. Further, we consider that participants should closely monitor the performance of the plant after a plant change or outage to identify any unexpected changes to plant capability.

We note that some participants may disable or amend frequency response functionality, or apply particular settings, when taking plant in and out of service for regular maintenance or testing. It is important that checking the status of these settings, before bidding the plant into contingency FCAS markets, is part of the return to service process or checklist.

3.3 Performance monitoring

Participants should not focus on testing after plant changes as the sole way of detecting any plant issues that may impact on their contingency FCAS delivery. Participants should also regularly assess the actual frequency response of plant that AEMO has enabled to provide contingency FCAS whenever the system frequency deviates from the normal operating frequency band, or otherwise specified in the MASS.

Regular performance monitoring is an essential part of a participant's compliance systems. We consider this level of monitoring is appropriate given that participants receive payments for being on standby to provide contingency FCAS but are relatively infrequently required to actually respond to frequency deviations.

We note that, in a recent judgment from the Federal Court of Australia,[10] the Court took into account, among other things:

- the failure of the respondent's compliance systems to detect and correct non-compliance in relation to contingency FCAS capability;[11] and
- the need to promote proactive compliance by providers given the difficulty of detection otherwise,[12]

in determining the size of the pecuniary penalty.

We remind participants that AEMO has created an "FCAS Verification Tool" (FCASVT) and associated user guide, which is available to assist participants.[13] The FCASVT is an Excel spreadsheet that is used by AEMO to verify whether contingency FCAS has been delivered in accordance with the MASS. AEMO also makes the FCASVT available to participants to assist in the calculation of the FCAS delivered by their plant/s. The FCASVT should be used as a screening tool for regularly assessing actual response to frequency disturbances

[10] Australian Energy Regulator v Hornsdale Power Reserve Pty Ltd [2022] FCA 738 (AER v HPR). The AER instituted these proceedings in the Federal Court of Australia alleging that the respondent breached the Electricity Rules in relation to its contingency FCAS capability.

[11] AER v HPR at paragraph 76.

[12] AER v HPR at paragraph 78.

[13] Available on AEMO's website.

against the requirements of the MASS. AEMO may be able to assist participants with inquiries about the FCASVT.[14]

The MASS provides that, if there is any inconsistency between the FCASVT and the MASS, the MASS will prevail to the extent of that inconsistency. To avoid doubt, the FCASVT is not part of the MASS.

Clause 3.11.2(i) of the Electricity Rules 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.

3.4 Contracting to third parties

Where a participant has contracted or engaged a third party (including an original equipment manufacturer) to undertake some or all of its contingency FCAS trading and/or plant operations, the primary responsibility for compliance remains with the participant. However, third parties could also be subject to civil penalties where they are knowingly concerned in, or a party to, a breach of a civil penalty provision (including the provisions specified in Section 2 of this bulletin).[15]

It is critical that the participant:

- clearly sets out the roles and responsibilities of all parties involved to achieve compliance with its obligations, including through appropriate controls and contractual relationships;
- ensures robust communication protocols and practices are in place to facilitate the provision of relevant information between all parties to enable each to meet their respective responsibilities; and
- has robust practices and procedures, which are clearly understood by all parties involved, to monitor compliance and ensure that the participant's relevant obligations are met. Among other things, this includes the participant ensuring that it understands the implications of all changes to plant that may impact on contingency FCAS capabilities, regardless of whether these changes are carried out by the participant, an original equipment manufacturer, or some other third party.

Participants should carry out due diligence when appointing contractors to ensure contractors have appropriate expertise to implement functions (including plant changes and maintenance) that may impact on contingency FCAS capabilities. This includes the

[14] The contact email address is support.hub@aemo.com.au. Participants should specify the relevant topic in the "What is your enquiry regarding" field e.g. "FCAS Verification Tool".

[15] Electricity Law, section 68.

participant ensuring that the appointed contractor has compliance systems in place where appropriate representatives of the contractor are required to contact the compliance officer of the participant to report any concerns about compliance with the Electricity Rules, in particular regarding failure to provide contingency FCAS in accordance with the requirements of the MASS.

While we acknowledge that in some cases a contractor or third party may be best placed to perform the necessary technical assessments, it is good practice for participants to independently monitor and/or verify performance against the MASS. As noted above, AEMO's FCASVT has been made available to participants to enable self-assessment of contingency FCAS performance; using the FCASVT does not require specialist power system modelling expertise.

3.5 Compliance with the MASS

The MASS sets out performance parameters and requirements which must be satisfied:

- in order for a service to qualify as the relevant market ancillary service; and
- when a participant provides the relevant kind of market ancillary service.

The MASS is a binding technical document with which contingency FCAS providers must comply when providing contingency FCAS or submitting contingency FCAS offers. All contingency FCAS providers should ensure they review, understand and observe the requirements of the MASS and be aware of any changes to the MASS.

We are aware that some generators primarily focus on ensuring compliance with GPS obligations on the assumption that this will ensure compliance with the contingency FCAS obligations in the Electricity Rules, or the requirements of the MASS. These GPS obligations relevantly include:

- S5.2.5.11, which sets out technical requirements for the frequency control and response of generation equipment connected to the power system; and
- rule 4.15, which (among other things) requires Registered Participants to comply with the GPS for their individual plant.[16]

In particular, we understand some participants perform testing of plant changes and monitor plant performance (including frequency response) with reference to GPS obligations only.

This compliance approach falls short of the AER's expectations. Generally, while there may be some overlap between the contingency FCAS obligations and the GPS requirements for frequency control, there are also substantial differences:

[16] The AER's Summer Readiness Compliance Bulletin provides further guidance on compliance with rule 4.15.

- The contingency FCAS obligations require participants to ensure their offers reflect the technical capability of their generating unit or load at all times, whatever the capability may be at the time the offer is made.
- While an individual participant's GPS may set out specific contingency FCAS or frequency response requirements for the generating unit with which the participant must comply, the MASS is the primary document defining the required technical parameters for delivery of each type of contingency FCAS.

It is important for participants to offer and provide contingency FCAS in accordance with the requirements of the MASS and any conditions and technical parameters agreed in their individual GPS.