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AEMC Directions Paper – frequency control rule changes

AGL Energy (**AGL**) welcomes the opportunity to comment on the Australian Energy Market Commission's (**AEMC**) Directions Paper on frequency control rule changes addressing Fast Frequency Response (**FFR**) and Primary Frequency Response (**PFR**).

AGL is one of Australia's largest integrated energy companies and the largest ASX listed owner, operator, and developer of renewable generation. AGL is also a significant retailer of energy and telecommunications, providing solutions to around 4.2 million across Australia.

The AEMC has comprehensively considered several options to give effect to the FFR and PFR rule change proposals, and our broad view is that some options may be overly complex. Where possible, we ask the AEMC to favour simpler, targeted reforms, to maximise benefits to the market.

We provide a summary of our views below, with further information on the more detailed aspects of the rule changes in the attached stakeholder submission template.

Fast frequency response

AGL agrees with the drivers for FFR put forward by Infigen, the rule proponent, that decreased inertia in the power system is giving rise to several challenges, including larger frequency deviations following contingency events.

We support amendments to existing contingency frequency control ancillary services (**FCAS**) arrangements through the addition of a 2-second raise and lower service, to sit alongside the six existing contingency services.

Primary frequency response

Our observations of the mandatory PFR roll-out, which began in late 2020, are that PFR settings have been effective in helping to stabilise power system frequency, and minimising recovery time following contingency events. That said, we do not consider that mandatory PFR, implemented at all scheduled and semi-scheduled plant, should continue beyond the sunset period of June 2023, nor is it necessary to have such excessive levels of PFR.

We support developing new FCAS arrangements (primary regulating services) for provision of PFR during normal operation. To support normal operation, the frequency response deadband would have to be narrow or moderate – that is, it must be less than the contingency band of +/-0.15Hz. We consider this approach will drive economically efficient PFR procurement that adequately meets system needs.

Finally, AEMO's technical advice on both FFR and PFR is still in development. We would appreciate the opportunity to review and comment on AEMO's advice in responding to the next consultation stage.

If you have any queries about this submission, please contact Liz Gharghori on (03) 8633 6723 or lgharghori@agl.com.au.

Yours sincerely,

Elizabeth Molyneux

General Manager Policy & Market Regulation

AEMC

Directions paper – Frequency control rule changes

STAKEHOLDER SUBMISSION TEMPLATE

The template below has been developed to enable stakeholders to provide their feedback on specific questions that the AEMC has identified in the directions paper for the frequency control rule changes.

The rule changes discussed in the frequency control directions paper are:

- AEMO – *Primary frequency response incentive arrangements* (ERC0263)
- Infigen Energy — *Fast frequency response market ancillary service* (ERC0296)

This template is designed to assist stakeholders provide valuable input on the questions the AEMC has identified in the directions paper. However, it is not meant to restrict any other issues that stakeholders would like to provide feedback on.

Given the breadth of issues discussed in the directions paper, it is not expected that all stakeholders respond to all the questions in this template. Rather, stakeholders are encouraged to answer any and all relevant questions.

SUBMITTER DETAILS

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CHAPTER 4 – FAST FREQUENCY RESPONSE MARKET ANCILLARY SERVICE

Question 1: Section 4.5.3 – PROBLEM DEFINITION AND REFORM OBJECTIVE — FFR RULE CHANGE	
What are stakeholders' views on the problem definition and reform objective for FRR as set out in section 4.5.3 of the directions paper?	AGL agrees that decreased inertia in the power system is giving rise to several challenges, including larger frequency deviations following contingency events. Market arrangements for FFR may be effective in combating these challenges in the immediate term, but we consider that market arrangements for inertia will be required in the longer-term noting the ESB's work in this area. We would suggest that once market arrangements for inertia are in place, FFR as a standalone service may no longer be required.
Question 2: Section 4.7.1 – FFR PROCUREMENT	
In relation to the discussion of potential procurement arrangements for FFR services in section 4.7.1 of the directions paper: • What are stakeholders' views on the pros and cons of establishing new FCAS market arrangements for FFR services versus revising the existing arrangements to incorporate FFR within the fast raise and fast lower services? • Do stakeholders agree that the existing arrangements for contingency FCAS provide an appropriate model for FFR market arrangements? • What are stakeholders' views on how each of the proposed procurement arrangements for FFR would interact with the arrangements for the existing contingency services? • Are there any aspects of the existing contingency FCAS arrangements that should be varied for procurement of FFR services?	To implement an FFR service, AGL supports a simple amendment to existing contingency FCAS arrangements through the addition of a 2-second raise and lower service, sitting alongside the six existing contingency services. This would require only minor changes to the technical specification for the 6 second 'fast' service to distinguish it from the new FFR service. Applying the existing framework removes the need to develop alternative procurement arrangements for FFR, thereby avoiding unnecessary administrative costs for AEMO and potential service providers.
Question 3: Section 4.7.2 – FFR PRICING ARRANGEMENTS	
In relation to the discussion of potential pricing arrangements for FFR services in section 4.7.2 of the directions paper: • What are stakeholders' views on the pros and cons of maintaining the	AGL supports maintaining existing FCAS pricing arrangements for FFR services, where participants are paid based on MWs enabled for the service at the market clearing price. Regarding performance-based multipliers, we do not consider these should be incorporated into the FFR pricing arrangements. The draft rule determination notes that AEMO can differentially

existing FCAS pricing arrangements for FFR services? • What are stakeholders' views on the potential pros and cons of incorporating performance-based multipliers into the pricing arrangements for FFR services? • Do stakeholders have any other comments or suggestions in relation to the pricing arrangements for FFR services?	value individual plant through the FCAS registration process by valuing more MWs of response from faster responding providers. We support retention of this arrangement for FFR services. Should we go down the path of performance-based multipliers, perhaps like the US 'mileage markets', it may be necessary to mandate some form of ongoing performance verification, where participants must show AEMO that they are providing services in accordance with the MASS. To achieve this, participants would require a reliable and comprehensive performance measurement tool. The existing FCAS verification tool is a starting point but would require additional refinement to be suitable for this purpose. Finally, a market that favors faster responses should also consider that in some instances, a response can be too fast, and therefore detrimental to the power system. It would be a perverse outcome to reward faster response in such circumstances.
Question 4: Section 4.7.3 – FFR COST ALLOCATION	
In relation to the discussion of arrangements for the allocation of costs associated with FFR services set out in section 4.7.3 of the directions paper: • What are stakeholders' views on the arrangements for the allocation of costs for FFR services? • Would it be appropriate for the cost of FFR services to be allocated in a similar way to the existing arrangements for the allocation of contingency FCAS costs?	Contingency FCAS costs are currently recovered from generators (raise services) and market customers (lower services). The rationale for this split is that the entire market benefits from a secure power system, and therefore all market participants should pay a share. We consider it appropriate that FFR services be considered in the same manner as existing contingency services. We appreciate the argument that the reduction in synchronous inertia is driving the need for FFR, and that costs should be allocated to causer on this basis. We think a better mechanism is to reward inertia provision, which the ESB is considering in the NEM2025 workstream.
Question 5: Section 4.8 – ISSUES FOR CONSIDERATION - FFR	
Are stakeholders aware of any additional issues that the Commission should take into account in developing market ancillary service arrangements for FFR?	In August 2020, AEMO declared an inertia shortfall in South Australia and ElectraNet, as the Inertia Service Provider, was tasked with managing the shortfall. We understand that tenders have been sought from potential FFR providers, to provide FFR when South Australia is islanded, with a response time of 1 second. While FFR and inertia are different services, in the above example, these services are being treated interchangeably. This raises two issues: 1. The intersection between region-specific FFR or inertia arrangements and NEM-wide arrangements may result in different technical specifications. It is unclear how the rule change would deal with this and which arrangements would take precedence. We would

	anticipate that AEMO's forthcoming advice will consider this issue and provide guidance on how to best to manage any crossover. 2. In Question 6, below, the AEMC has queried whether it is appropriate to value inertia provided through the FFR service. In the SA example, FFR is acting as a proxy for inertia, and there is an argument that this would be the case for the NEM should this rule be made. Our view is that it is likely appropriate to value inertia provided through the FFR service (see response below).
Question 6: Section 4.8.1 – VALUATION OF INERTIAL RESPONSE	
In relation to the potential arrangements for the valuation of inertial response described in section 4.8.1 of the directions paper: • What are stakeholders' views on the valuation of inertial response as part of the contingency services, including the proposed new FFR contingency services? • What are stakeholders' views on the current governance arrangements for contingency services; where the detailed service specification is determined by AEMO and documented in the MASS? (Is it appropriate for the NER to provide further guidance on how inertial response should be considered in the MASS?)	AGL supports changes to the NER to ensure that inertia is appropriately compensated and have previously suggested to the AEMC that a competitive tender process may be an appropriate way to achieve this. That said, the ESB is considering how best to value inertia as a standalone service and it is not the subject of this consultation. The AEMC queries whether inertial response, as a 'by-product' of providing FFR contingency service, should be valued (included) in the payment a participant receives for providing FFR. Pricing FFR in this way would require a calculation of the inertia 'benefit' a participant provides in each trading interval and determining a fixed or dynamic monetary value for this benefit. FFR would likely be priced as the participant's MWs enabled for the service at the market clearing price, with an inertia payment on top of this, in specified circumstances. Should the AEMC go down this route, the NER would have to be amended (cl. 3.11.2 Market ancillary services and perhaps even cl. 3.9.2A Determination of ancillary services prices) to explicitly state that inertial response will be valued and priced as part of the contingency FFR services. Detailed technical specifications, including measurement of inertial response, could then be documented in the MASS. Our leaning is that this would be appropriate, but we note that it would be complex and could therefore delay implementation of the FFR service, and would eventually have to link in with any future valuing of inertia through the ESB's work.
Question 7: Section 4.8.2 – PRICE RESPONSIVE DEMAND FOR CONTINGENCY SERVICES	
In relation to the discussion of arrangements for incorporating price responsiveness into the procurement of contingency services in the NEM set out in section 4.8.2: • What are stakeholders' views on the potential pros and cons	The draft rule determination states that the intention of the demand-curve approach to FCAS procurement would be that the benefit to consumers from increased power system resilience would exceed the costs for the additional FCAS above the minimum requirement.

associated with the implementation of a "demand curve" approach to procurement of FCAS? • What are stakeholders' views on the priority of such a change to the market frameworks? • If such an approach was to be implemented, what are stakeholders' views on the appropriate governance arrangements, including the potential oversight role for the AER?	Our inclination is that the proposed demand-curve approach to FCAS procurement is not helpful to the power system or to consumers. Given its complexity, we do not consider this issue should be pursued within the current rule change request, but offer the following for the AEMC's consideration: • We query whether there is a missed step, and that first it may be necessary to determine the value of increased power system resilience, perhaps in a similar manner to the AER's determination of the values of customer reliability. • We consider this can be managed through the existing framework. If increased resilience has economic value, is this not better reflected through power system constraints? • Finally, we wonder whether there would be a distortionary impact on the energy market should FCAS "reserves" be procured. Careful consideration should be given to potential intended consequences.
Question 8: Section 4.8.3 – INTERACTION BETWEEN MANDATORY PFR & FFR ARRANGEMENTS	
What are stakeholders' views in relation to the potential interactions between new FFR arrangements and the Mandatory PFR arrangement?	Our views on mandatory PFR are set out in the section below, but in summary we do not consider a mandatory PFR requirement should apply from 2023 onwards. Instead, efficient levels of PFR should be procured from providers who would be required to maintain headroom for the service. Non-mandatory PFR should continue to be provided at a narrow deadband, within the +/-0.15Hz contingency band that would trigger FFR, thereby giving would-be service providers the option of maintaining headroom for PFR or FFR. Similar acronyms aside, PFR and FFR are different services, each serving a different purpose within the power system. With technical settings and procurement kept separate, any potentially negative interactions would be minimised.
Question 9: Section 4.8.4 – IMPLEMENTATION AND STAGING FOR FFR	
In relation to the discussion of the implementation arrangements for FFR services as set out in section 4.8.4: • What are stakeholders' views in relation to the process for the implementation of FFR arrangements in the NEM? • What are stakeholders' views on the potential need for interim or transitional arrangements as part of the transition to spot market	AGL agrees with the process for implementation of FFR as described in the draft rule determination, noting that along with changes on AEMO's side, participants would also have to make changes (e.g. bidding software, plant settings) to be ready to provide the FFR services. It may be the case that transitional arrangements are necessary to implement market arrangements for FFR. For example, AEMO will need to develop its understanding of network conditions and any specific locational requirements or constraints. On the participant-side, the registered FFR capacity values may need to be reconsidered once a participant's real-world FFR performance is assessed following a contingency event.

arrangements for FFR?	Overall, AGL considers that FFR arrangements be established as soon as possible, to meet system needs.

CHAPTER 5 – PRIMARY FREQUENCY RESPONSE INCENTIVE ARRANGEMENTS

Question 10: Section 5.1.3 – THE ROLE OF MANDATORY PFR	
In relation to the discussion of the role for a mandatory obligation as part of the enduring PFR arrangements in the NEM, set out in section 5.1.3: • Do stakeholders agree that a mandatory PFR arrangement provides a valuable safety net to help protect the power system from significant non-credible contingency events? • Do stakeholders agree that the narrow, moderate and wide settings for a mandatory PFR response band adequately represent the broad policy options for the frequency response band for Mandatory PFR?	With the experience of the mandatory PFR roll-out to draw on, our view is that the PFR settings are working to stabilise system frequency. We have observed that recovery time following contingency events has reduced and that the power system is overall more resilient to frequency deviations. The improvements we have seen occurred with mandatory PFR implemented at around 30 per cent of scheduled/semi-scheduled generators. On this basis we do not consider that NEM-wide mandatory PFR is required. The same excellent power system results could be achieved by procuring the necessary amount of PFR through market arrangements. Regarding the policy options for the frequency response band, the narrow, moderate, and wide settings do seem to represent the available options.
Question 11: Section 5.4 – PROBLEM DEFINITION AND REFORM OBJECTIVE — PFR INCENTIVE ARRANGEMENTS RULE CHANGE	
What are stakeholders' views on the problem definition and reform objectives for enduring PFR arrangements set out in section 5.4?	AGL does not agree with all aspects of the problem definition. We agree that enduring PFR would assist in controlling power system frequency during normal operation, but do not consider that provision must be mandated. Provision of PFR should be appropriately valued and procured at efficient levels, to ensure scarcity signals and therefore investment drivers are maintained, particularly as large thermal units (traditional PFR providers) exit. We agree with the summary of actions proposed by the AEMC.
Question 12: Section 5.4.1 – ECONOMIC ANALYSIS OF MANDATORY PFR	
In relation to the discussion of the costs and benefits of Mandatory PFR arrangements set out in section 5.4.1: • What are stakeholders' views of the indicative curves for costs and benefits of Mandatory PFR with respect to the frequency response band settings, set	AGL agrees that getting the frequency respond band setting right is critical to establishing effective enduring PFR arrangements. Our views on enduring PFR arrangements, including potential deadbands, are given in response to Question 17.

out in figure 5.4? • Do stakeholders agree that the frequency response band setting is a key variable for the determination of enduring PFR arrangements that meet the power system needs and are economically efficient over the long term? • What are stakeholders' views on the effectiveness of the exemption framework under the Mandatory PFR arrangement? • What are stakeholders' views on the role that the allowance for variable droop settings plays in relation to the cost impacts of Mandatory PFR? • Based on the initial roll out of the Mandatory PFR arrangement to generators over 200MW, what are stakeholders' views on how the cost impacts of Mandatory PFR are impacted by the proportion of the fleet that is responsive to frequency variations? • What other considerations are there in relation to developing effective and efficient arrangements for PFR in the NEM?	Narrow band PFR implementation costs vary widely between plant. Generators that had been required to provide PFR under previous iterations of the NER have likely faced lower costs in implementing mandatory PFR compared to generators constructed when no such requirement existed. We have found the variation framework under the Mandatory PFR arrangement to be effective, with AEMO granting variations from the PFR requirements where the costs of strict compliance would have been onerous and caused significant delays in implementation.
Question 13: Section 5.5 – ADVICE FOR ENDURING PFR ARRANGEMENTS	
What are stakeholders' views of the Commission's proposed approach to obtaining advice to inform its determination of enduring arrangements for PFR in the NEM?	We support the AEMC's proposal to seek independent advice alongside AEMO's advice. As the proponent of the mandatory PFR rule, AEMO is likely to seek continuation of narrow band mandatory PFR. AEMO must maintain the power system in a satisfactory operating state and will likely take a risk averse approach. It is not AEMO's primary role to balance risk with considerations of economic efficiency, and the costs ultimately borne by end users. This is where an independent expert can add value.
Question 14: Section 5.6.1 – PROCUREMENT ARRANGEMENTS FOR NARROW BAND PFR SERVICES	
In relation to the discussion of potential procurement arrangements for narrow band PFR services in section 5.6.1: • What are stakeholders' views on three options identified for further consideration?	As stated in response to question 10, mandatory PFR implementation has had a positive effect on the power system with around 30 per cent of scheduled/semi-scheduled generators implementing narrow band settings. We anticipate similar power system benefits could be achieved through option two, new market ancillary service arrangements for primary regulation services, or option three, new incentive-based arrangements for voluntary provision.

a. Existing market ancillary service arrangements b. New market ancillary service arrangements c. New incentive-based arrangements for voluntary provision • Are there any other options that would be preferable?	Option two would require changes to the MASS to differentiate between the proposed new primary regulation services, existing regulation services, and existing contingency services, recognising the different roles played by each service. Option two maximises economic efficiency, as the level of primary regulating service required would shift dynamically through the dispatch engine and be priced based on competitive bidding. Voluntary PFR provision under option three is more complicated, as it is unclear how the level of PFR procured will be optimised against power system needs, and therefore how it will be priced.
Question 15: Section 5.6.2 – PROCUREMENT ARRANGEMENTS FOR NARROW BAND PFR SERVICES	
What are stakeholders' views on the arrangements for the pricing of PFR as described in section 5.6.2?	Generally speaking, narrow band PFR places a high degree of stress on the generating unit providing it, with greater wear and tear experienced, particularly with there is a limited number of service providers. Any pricing arrangements must be commensurate with this burden. Pricing through the dispatch of market ancillary services would be appropriate for procurement option two and is likely the simplest option overall, given existing FCAS arrangements. It allows participants to determine what price they are willing to accept for providing the service, considering the costs they incur to provide it. We would support this pricing approach should the AEMC introduce new market ancillary service arrangements for PFR. AGL is keen to see the work IES is undertaking on double-sided causer pays. While potentially complicated to calculate, there is a fairness is allocating costs to participants that cause frequency deviations, while rewarding those that help to minimise or counter deviations. Accordingly, we would also welcome further investigation of frequency response deviation pricing, which is based on a similar penalise and reward principle. We do not support further consideration of regulated pricing for PFR. Setting a single, regulated price, does not account for the different costs of providing PFR from various technology types and network/regional locations. Further, regulated pricing does not support competitive, market-based procurement, which is our preferred pathway for enduring PFR.
Question 16: Section 5.6.3 – ALLOCATION OF COSTS FOR NARROW BAND PFR	
What are stakeholder's views on the allocation of costs for narrow band PFR services as described in section 5.6.3? Do stakeholders agree that the any additional costs for narrow band PFR be allocated through the existing causer pays procedure for the allocation of regulation costs (or a revised version as described in section 5.9?	AGL agrees with the AEMC that it may be most appropriate to allocate narrow band PFR costs within the existing regulation service cost allocation, based on a causer pays principle. This is a simple and fair allocation. Per section 5.9 of the draft rule determination, we would also support the residual factor of regulating services cost recovery to be shared by market customers and non-metered market generation.

Question 17: Section 5.7 – PATHWAYS FOR ENDURING PFR ARRANGEMENTS	
In relation to the pathways for enduring PFR arrangements set out in section 5.7: • What are stakeholders' views on the enduring PFR pathways? • Do stakeholders agree with the Commission's preliminary preference for pathway two? (the widening of the PFCB and the introduction of market arrangements for narrow band PFR)	1. Maintain the existing Mandatory PFR arrangement with improved PFR pricing. We do not support retaining existing mandatory PFR arrangements, as fleetwide PFR provision is far in excess of NEM requirements and therefore inefficient. 2. Revise the Mandatory PFR arrangement by widening the PFCB and develop new FCAS arrangements for the provision of PFR during normal operation (primary regulating services) AGL supports developing new FCAS arrangements (primary regulating services) for provision of PFR during normal operation. To support normal operation, the frequency response deadband would have to be narrow or moderate – that is, it must be less than the contingency band of +/-0.15Hz. We consider new FCAS arrangements to be preferable to voluntary incentive-based provision. As stated in response to question 14 on voluntary PFR provision, it is unclear how the level of PFR procured will be optimised against power system needs, and therefore how it will be priced. Retaining a mandatory PFR requirement at a wide deadband of +/-0.5Hz may provide some benefit in assisting the power system recovery from non-credible contingency events, and we are not opposed to this suggestion. 3. Remove the Mandatory PFR arrangement and replace it with alternative arrangements for PFR. To the extent this is similar to pathway 2, AGL supports replacing existing mandatory with a new market ancillary service to support the power system during normal operation.
Question 18: Section 5.8 – FUTURE REVIEW OF THE FOS	
What are stakeholders' views of the Commission's proposed approach towards a future review of the FOS as part of the development of enduring PFR arrangements?	AGL supports a review of the FOS both as part of the development of enduring PFR arrangements and the potential introduction of an FFR contingency service. The current FCAS categories have been in place for some time, but with the potential introduction of a new regulation and contingency service, it makes sense to review the underlying system standard on which the frequency control services are based. This would help to ensure the correct reforms are being progressed and that the frequency operating standard remains fit for purpose in a transitioning power system.
Question 19: Section 5.9 – REFORMS TO THE NER RELATING TO COST ALLOCATION FOR REGULATION SERVICES – CAUSER PAYS	

In relation to the proposed reforms to the NER relating to the allocation of regulation costs, set out in section 5.9: • What are stakeholders' views on the proposal to allocate regulation costs on the basis of performance against system frequency as opposed to Frequency indicator (FI)? • What are stakeholders' views on the proposal to align the sample and application periods for determination of causer pays factors and shorten the application period to 5 minutes, in line with the NEM dispatch interval? • What are stakeholders' views on the removal or shortening of the ten-day notice period for causer pays contribution factors? • What are stakeholders' views on AEMO's proposal to pre-calculate seven sets of contribution factors including local contribution factors? • What are stakeholders' views of AEMO proposal to include non-metered generation in the residual component for allocation of regulation costs?	• Should double-sided causer pays be introduced, whether for PFR or existing regulation FCAS, AGL is open to further investigation of applying system frequency instead of the FI calculated by AEMO's AGC system. A generator's frequency response is largely based on the local frequency, and thus the local system frequency may be the more appropriate value to use in determining double-sided causer pays. • In the absence of double-sided causer pays, we consider that FI likely remains the more appropriate reference point for allocating regulation costs. FI directly correlates to the amount of regulation FCAS procured at any given time and is therefore based on a generator's performance compared with system need. • AGL supports alignment and shortening of the sample application period to 5 minutes and removal or shortening of the 10-day notice period for causer pays contribution factors. We consider these changes are likely to provide real-time signals to market participant, which should in turn lead to improved outcomes. • AGL agrees with the AEMC that it is not appropriate for a market participant's plant in one NEM region to be allocated costs for a local requirement for regulation services in another region, and we support amendments to the NER to include local contribution factors. • AGL supports AEMO's proposal to include non-metered generation in the residual component for allocation of regulation costs, alongside market customers. This more fairly apportions costs amongst participants.