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| Interim Primary Frequency Response Requirements |
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# INTRODUCTION

## Purpose and scope

These are the interim *primary frequency response requirements* made under clauses 11.112.2 and 4.4.2A(a) of the National Electricity Rules (**PFRR**).

The PFRR have effect only for the purposes set out in the National Electricity Rules (**NER**). The NER and the *National Electricity Law* prevail over the PFRR to the extent of any inconsistency.

## Definitions and interpretation

### Glossary

Terms defined in the *National Electricity Law* and the NER have the same meanings in these PFRR unless otherwise specified.

Terms defined in the NER are intended to be identified in these PFRR by italicising them, but failure to italicise a defined term does not affect its meaning.

The words, phrases and abbreviations in Table 1 have the meanings set out opposite them when used in these Procedures.

1. Defined Terms

| Term | Definition |
| --- | --- |
| Affected Generator | *Scheduled Generator* and *Semi-Scheduled Generator*. |
| Affected GS | The *generating system* of an Affected Generator. |
| Affected GS’ Deadband | The deadband at which the Affected GS will be operated in accordance with AEMO’s approval in accordance with section 6.3. |
| DCS | Distributed control systems. |
| Droop | As defined in clause S5.2.5.11(a) of the NER. |
| LNSP | An Affected Generator’s *Local Network Service Provider.* |
| Maximum Operating Level | As defined in clause S5.2.5.11(a) of the NER. |
| Minimum Operating Level | As defined in clause S5.2.5.11(a) of the NER. |
| OEM | Original equipment manufacturer. |
| PFCB | *Primary frequency control band* |
| PFR | *Primary frequency response* |
| PFRP | *Primary frequency response parameters* |
| PFRR | *Primary frequency response requirements* |
| PFR Settings | The *frequency response mode* settings (deadband, droop and response time) applicable to an Affected GS, as approved by AEMO in accordance with section 6.3. |
| Results | As defined in section 5.1(a). |
| RMS | Root mean square |

### Interpretation

The following principles of interpretation apply to these PFRR unless otherwise expressly indicated:

* + - 1. These PFRR are subject to the principles of interpretation set out in Schedule 2 of the *National Electricity Law*.
			2. References to *frequency* should be read as referring *frequency* as measured at an Affected GS’ *connection point*.
			3. Units of measurement are in accordance with the International System of Units.

# REQUIREMENT TO PROVIDE PFR

Unless exempted by AEMO, or the PFRP are varied, under section 7, Affected Generators must commence providing PFR every time they receive a *dispatch instruction* in the *spot market* of >0MW in respect of an Affected GS in accordance with its PFR Settings by the date required by AEMO under section 6.3 or 7.4.2, as applicable.

As required by clause 4.4.2A(c) of the NER, there is no requirement for Affected Generators to maintain stored energy in their Affected GSs for the purpose of providing PFR.

# PRIMARY FREQUENCY RESPONSE PARAMETERS

## General

The PFR Settings must be within the PFRP, which are set are set out in section 3.

## Maximum Allowable Deadband

Each Affected GS must provide PFR outside the Affected GS’ Deadband, which must be no wider than the PFCB.

## Droop

For all Affected GS, Droop must be set to less than or equal to 5%.

The change in *frequency* is to be measured from the upper or lower limit (as applicable) of the Affected GS’ Deadband, as shown in Equation 1.

Equation 1:

| $$Droop (\%)=100×\frac{∆F/50}{∆P/P\_{MAX}}$$ |
| --- |

Where:

$∆F$ is the frequency deviation beyond the limit of the Affected GS’ Deadband, in Hz.

$∆P$ is *active power* change, in MW.

$P\_{MAX}$ is the Maximum Operating Level in MW.

Droop may be asymmetrical for over- and under-*frequency* responses.

## Response Time

Unless limited by stability, inherent *plant* capability, mode of operation or other limitations as described in section 4.2, an Affected GS should be capable of achieving a 5% change in *active power* output, within no more than 10 seconds, resulting from a sufficiently large positive or negative step change in *frequency* greater than the Affected GS’ Deadband and less than or equal to 0.5 Hz.

The response time is measured from when the *frequency* crosses the limit of the Affected GS’ Deadband until *active power* reaches a 5 % change based on PMAX. The sustained change in *active power* resulting from the *frequency* step, may be greater than 5%, in order to demonstrate this capability.

For the avoidance of doubt, a more rapid change in output in response to a change in *frequency* is acceptable, and *plant* should not be deliberately slow or reduce its response to match this minimum requirement.

An Affected GS’ control settings must ensure an *adequately damped* response to a change in *frequency*.

The change in an Affected GS’ *active power* output following a *frequency* deviation outside the Affected GS’ Deadband must commence with no delay beyond that inherent in the *plant* and *plant* controls.

# Additional PERFORMANCE requirements

## No Withdrawal of Response

Where it is safely and stably capable of doing so and considering *plant* load controllers or distributed control systems (**DCS**) and governor response, an Affected GS should continue to deliver PFR until *frequency* returns to be within the Affected GS’ Deadband.

PFR should not be deliberately withdrawn or defeated by a *plant* load controller to return an Affected GS to a *market dispatch* target while *frequency* remains outside the Affected GS’ Deadband.

## Range of Response

The magnitude of an Affected GS’ *active power* change that results from *frequency* deviating from 50 Hz must not be unnecessarily limited, however, it may be necessary to limit the Affected GS’ response to:

* maintain operation between the Affected GS’ Maximum Operating Level and Minimum Operating Level;
* avoid rough running ranges associated with the Affected GS;
* maintain the Affected GS’ operation within environmental operating licence conditions;
* manage safety or stability of the Affected GS; or
* respond to primary energy availability, such as the availability of fuel or stored pressure for thermal *generation*, wind for wind *generation*, sunlight for solar *generation*, head level for hydro *generation* or number of coal mills in-service for coal *generation*.

An Affected GS should not use load limiters or similar controls to limit or restrict the Affected GS’ response to a level below what could otherwise be safely and stably delivered, if that limiter were not in place.

## Continuity of Response

PFR must remain continuously enabled at the PFR Settings, unless agreed with AEMO, independent of *ancillary services* *enablement*.

# INITIATION OF APPLICATION

## Existing Affected Generators

By the datespecified in Table 2,each Affected Generator must:

* 1. assess the ability of each of its Affected GS to meet the PFRP and submit to AEMO the results of that assessment in the form shown in Appendix A (**Results**);
	2. nominate using the form in Appendix A whether it wishes to alter the Affected GS’ Deadband to ±0.015Hz in one step, or to ±0.05Hz and then to ±0.015Hz on another date, to be co-ordinated by AEMO; and
	3. if the Affected Generator wishes to apply for exemption from, or variation to, the application of the PFRP to an Affected GS, submit an application in the relevant form under section 7.
1. Due dates for Affected Generator self-assessments

| **Nameplate Rating of Affected GS** | **Self-Assessment Due[[1]](#footnote-2)**  |
| --- | --- |
| >200 MW | 60 *business days* |
| Between 200 MW and 80 MW | 120 *business days*  |
| <80 MW | 180 *business days* |

If a group of Affected Generators with a common parent company wish to submit the Results of each Affected GS together, they may do so, provided each Affected Generator is clearly identified and confirmation of the relationship between the specified Affected Generators is provided with the Results.

## Connection Applicants

Prior to the commencement of commissioning, a *Connection Applicant* proposing to *connect* a *generating system* that will comprise *scheduled generating units* or *semi-scheduled generating units* (or any combination of the two) must either:

* 1. notify AEMO of the proposed PFR Settings for that *generating system*, which must bewithin the PFRP using the form in Appendix B; or
	2. seek an exemption from, or variation to, the application of the PFRP in accordance with section 7,

and submit to AEMO either the notice of the proposed PFR Settings, or application for exemption/variation, with its application for registration as a *Generator*.

# AEMO ASSESSMENT

## Insufficient Information

If AEMO considers that an Affected Generator has not provided enough information for AEMO to assess an Affected Generator’s ability to meet the PFRP, AEMO will forward a request to the Affected Generator specifying the further information required within 5 *business days* of receiving the Affected Generator’s Results.

The Affected Generator must provide the further information requested within 5 *business days* of receiving AEMO’s request.

## Extension of Time

In its absolute discretion, AEMO may grant the Affected Generator additional time to provide the Results, or further information requested under section 6.1, if AEMO is satisfied that an Affected Generator cannot reasonably provide the Results, or further information, within the required time.

## AEMO Response

AEMO will discuss each Affected Generator’s Results provided with the relevant Affected Generator and within 20 *business days* of receiving the relevant Results, or any further information requested under section 6.1, whichever is the later.

AEMO’s aim is to co-ordinate the commencement of the provision of PFR by blocks of Affected GS. Consequently, upon receipt of all Affected Generator Results, AEMO will be seeking to organise the commencement of the provision of PFR by Affected GSs in blocks of sufficient size so as to minimise the impact on each Affected GS as much as possible.

Hence, AEMO will be contacting as many Affected Generators as possible to co-ordinate the commencement dates of their provision of PFR but will be notifying each Affected Generator of the agreed PFR Settings and other information relevant to the commencement of the provision of PFR by each Affected GS owned by the Affected Generator separately.

AEMO will confirm with each Affected Generator the agreed PFR Settings and other relevant information for each Affected GS in the form set out in Appendix C.

### Affected Generators whose plant meets PFRP

Once AEMO has confirmed the applicable PFRP with an Affected Generator, AEMO will respond to the Affected Generator using the form in Appendix B to confirm the following with respect to each Affected GS:

* The Affected GS’ Deadband and whether it will be altered in one, or two steps, as contemplated by section 5.1.
* The Affected GS’ Droop.
* The date by which the Affected GS must commence providing PFR.

### Affected Generators who need to adjust plant to meet PFRP

AEMO will liaise on the following matters with each Affected Generator who needs to adjust its plant to ensure its Affected GS can meet the PFRP:

* Control settings;
* The scope of works to be effected to meet one or more PFRP;
* The date by which completion of works to ensure the Affected GS can meet the PFRP must be completed; and
* The date by which the Affected GS must be ready to commence providing PFR.

Once AEMO is satisfied that each of these matters is agreed, AEMO will confirm those with the Affected Generator and may set conditions on the completion of each action until the Affected GS is ready to provide PFR in accordance with these PFRR.

If an Affected Generator is not likely to be ready to provide PFR in accordance with these PFRR as confirmed by AEMO, the Affected Generator must notify AEMO promptly and, if appropriate, seek an extension, with reasons and supporting information, which AEMO will consider and respond within 20 *business days* of receipt of the application for extension.

# EXEMPTIONS AND VARIATIONS

## Principles

Clause 4.4.2B(a) of the NER specifies several principles that AEMO must have regard to when considering whether to approve an application for exemption from, or variation to, any of the PFRP. These are considered briefly in the remainder of section 7.1, particularly as to how Affected Generators might need to demonstrate why an application for exemption or variation should be granted.

### Capability

If an Affected Generator’s application for exemption is on the basis that an Affected GS is inherently incapable of operating in *frequency response mode,* the Affected Generator must demonstrate this incapability no matter what changes are made to the Affected GS by providing AEMO with copies of relevant original equipment manufacturer (**OEM**) specifications or test results.

### Costs vs Market Turnover

If an Affected Generator’s application for exemption or variation is on the basis that the costs likely to be incurred in modifying and operating an Affected GS to be capable of operating in *frequency response mode* relative to the *market* revenue derived during its expected operating hours are prohibitive, the Affected Generator must provide supporting documentation evidencing the expected costs of modifying and operating the Affected GS.

### Stability

If an Affected Generator’s application for exemption or variation is on the basis that an Affected GS will operate unstably when operating in *frequency response mode,* the Affected Generator must provide evidence of test results or other technical information, including evidence from the OEM, to demonstrate the unstable operation.

Whether this has the potential to impact *power system security* is a matter for AEMO.

### Ongoing Costs

If an Affected Generator’s application for exemption or variation is on the basis that the ongoing costs of operating an Affected GS in *frequency response mode* are expected to be excessive, the Affected Generator will need to provide evidence of the ongoing costs of operation, including supporting documentation.

### Physical Characteristics

If an Affected Generator’s application for exemption or variation is based on other physical characteristics that affect the Affected GS’ ability to operate in *frequency response mode*, the Affected Generator will need to consider the type of evidence that will substantiate the claim. For example:

* ***Dispatch inflexibilities*** – As this is a requirement that can vary from *trading interval* to *trading interval*, or be outside an Affected Generator’s control, the Affected Generator will need to provide evidence of the conditions under which *inflexibility* could affect an Affected GS’ ability to operate in *frequency response mode*.
* ***Energy constraints*** – As this is a requirement that can vary from *trading interval* to *trading interval*, or be outside an Affected Generator’s control, the Affected Generator will need to provide evidence of the conditions under which *energy constraints* could affect an Affected GS’ ability to operate in *frequency response mode*, which could include copies of fuel supply contracts, climactic conditions, or weather patterns.
* **Licensing or other conditions of operation** – If a regulatory licence to operate restricts the operation of an Affected GS to such an extent that it will not be able to operate in *frequency response mode* under certain conditions, the Affected Generator will need to provide AEMO with a copy of the relevant licence and other relevant information about its enforceability and evidence of when the conditions are likely to occur.
* **Connection Agreement** – If there are any restrictions in an Affected Generator’s *connection agreement* with its LNSP that impact the Affected Generator’s ability to provide PFR in accordance with these PFRR, the Affected Generator will need to provide AEMO with a copy of the relevant parts of the *connection agreement* and any other relevant information about its enforceability and evidence of when the restrictions are likely to apply.

## Application for Exemption

Where an Affected Generator seeks an exemption from the requirement to operate an Affected GS in accordance with these PFRR, it must submit an application for exemption to AEMO in the form in Appendix D detailing the Affected GS’ limitations with reasons and supporting evidence.

## Application for Variation

Where an Affected Generator seeks a variation from the requirement to operate an Affected GS in *frequency response mode* in accordance with one or more of the PFRP, it must submit an application for variation in the form in Appendix E to AEMO detailing the Affected GS’ limitations, with reasons and supporting evidence.

## Application Process

### Insufficient Information

If AEMO considers that an Affected Generator has not provided enough information for AEMO to assess an Affected Generator’s application for exemption or variation, a request specifying the further information required will be forwarded to the Affected Generator within 10 *business days* of receiving the Affected Generator’s application for exemption.

The Affected Generator must provide the further information requested within 10 *business days* of receiving AEMO’s request.

### AEMO Response to Application

AEMO will determine whether to grant an exemption or variation within 20 *business days* of receiving an Affected Generator’s application, or provision of any further information requested under section 7.4.2, whichever is the later in the form in Appendix F.

If AEMO rejects an application for exemption, AEMO may grant the Affected Generator a variation from one or more of the PFRP, instead.

AEMO may grant an exemption or variation with, or without, conditions, as appropriate.

## Standing Exemptions

### Steam Stage of Combined Cycle Gas Turbines

The steam turbine component of a combined cycle gas generator does not need to be frequency responsive.

# STABILITY TESTS

## General

Any change to a *control system* or primary plant will require at a minimum a step response stability test as specified in section 8.2, or where a step test might not be possible, an alternative test to demonstrate stability following changes to meet the PFRR.

Where material changes are only made to DCS, or to governor or *plant* load controller deadbands, modelling and testing beyond that described in section 8.2 will not be required by AEMO until expiry of the testing cycle detailed in an Affected GS’ compliance program under clause 4.15(b) of the NER.

Material changes beyond DCS, or governor or plant load controller deadbands will require the Affected Generator to test its Affected GS at the time when these changes are made, in accordance with the requirements of the GPS Compliance Assessment and R2 Model Validation Test Plan Templates[[2]](#footnote-3).

## Demonstration of Stability

Once an Affected GS meets the PFRP, its stability must be demonstrated. AEMO prefers that Affected Generators conduct the frequency step response stability test described in section 8.2.1 but if an Affected Generator cannot inject frequency to carry out that test, for example, where it uses a mechanical governor, it can submit the results of its Affected GS’ performance following a suitable *power system* disturbance in accordance with section 8.2.2.

### Step Response Stability Test

A test plan for a step response stability test must be submitted to AEMO a minimum of 10 *business days* prior to the proposed date for testing.

A positive frequency step signal equivalent to create 5%, or greater, change in *active power* must be injected into the frequency controller summing junction. The response is to be recorded allowing at least 10 seconds pre-triggered recording and at least 60 seconds recording time after the response has settled at its steady-state value.

The tester must assess whether the recorded response is *adequately damped*, and if so, repeat the test with a negative frequency step signal of the same size.

The test is to be undertaken from a loading that will allow a full positive and negative 5% *active power* change to be achieved.

The *active power, reactive power* and RMS *voltage* must be recorded during the test. Values are to be provided to AEMO at a sample rate of no less than one sample per cycle, unless agreed by AEMO. Where practicable, the injected frequency signal is to be recorded while synchronised with the other measurements.

### Actual Response to Power System Disturbance

Where an Affected Generator cannot carry out the test described in section 8.2.1 and the Affected GS is operating in accordance the PFRP, the Affected Generator may submit records of the Affected GS’ performance following one or more *power system* disturbances to demonstrate stability.

The records required include *frequency*, *active power, reactive power* and RMS *voltage*. Values are to be provided to AEMO at a sample rate of no less than one sample per cycle, unless agreed by AEMO that a different rate is acceptable.

# COMPLIANCE

## Ability to Operate in Frequency Response Mode and Sustain PFR

An Affected GS will not be in breach of the requirement in section 4.1 to not withdraw its response where the Affected GS could not sustain PFR for one or more of the following reasons:

* Primary energy availability, such as the availability of fuel or stored pressure for thermal *generation*, wind for wind *generation*, sunlight for solar *generation*, head level for hydro *generation* or number of coal mills in-service for coal *generation*.
* Physical limits related to plant capability or safety, such as operating temperature limits, rough running zones, or pressure limits.
* Environmental limits.

## Changes to PFR Settings

An Affected Generator must not adjust the PFR Settings of an Affected GS in a manner that would no longer meet one or more PFRP or the terms of any previously approved variation for an Affected GS, unless the Affected Generator has applied for a variation and obtained the approval of AEMO to do so. The Affected Generator must apply to AEMO using the form in Appendix E and follow the process for a variation, as detailed in section 7.4.

AEMO will respond to the application in the form in Appendix F within the time specified in section 7.4.2.

# Publication of Primary Frequency Response outcomes

AEMO will publish and maintain on its website a list of Affected GSs and an indication of whether each Affected GS is:

* 1. required to maintain its PFR Settings;
	2. exempt from the requirements of this PFRR; or
	3. subject to a variation of one or more PFRP, and if so, which parameters are varied.
1. PRIMARY FREQUENCY RESPONSE REQUIREMENTS results of self-assessment

**Section 1: Applicant**

|  |  |
| --- | --- |
| Applicant |  |
| ABN |  |

Where the Applicant represents a number of related parties who are Affected Generators, a document showing the relationships between the Applicant and those Affected Generators should also be provided.

**Section 2: Generating System & Local Network Service Provider (LNSP)[[3]](#footnote-4)**

|  |  |
| --- | --- |
| Name |  |
| DUID |  |
| Connection Point |  |
| Registered Capacity  |  |
| Technology |  |
| LNSP |  |

**Section 3: Results of Self-Assessment**

The following are the results of the Applicant’s self-assessment of the Generating System’s ability to meet each PFRP (attach supporting information, if required, or relevant[[4]](#footnote-5)):

|  |  |
| --- | --- |
| Deadband |  |
| Droop |  |
| Response Time |  |

**Section 4: Nomination of Changes to deadband**

For each Affected GS, nominated below are how the Applicant wishes to effect changes to the Affected GS’ deadband:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | DUID |  |  |  |  |  |
| One change to ±0.015Hz  |  |  |  |  |  |  |
| Two changes:1. ±0.05Hz by [insert date]; then
2. ±0.015Hz by [insert date]
 |  |  |  |  |  |  |

**Section 5: Adjustments required** – If required[[5]](#footnote-6), for each Affected GS, indicate the adjustments needed to be made to plant to ensure the Affected GS can meet each PRFP. Attach supporting information, if required, or relevant.

|  |
| --- |
| DUID |
| Deadband |  |
| Droop |  |
| Response Time | (provide evidence of inherent delays in plant response or any physical, environmental, temperature or other limits that could impact response time, include its range and continuity – see additional performance requirements referred to in section 4.) |

**Section 6: Applicant Contacts for Queries[[6]](#footnote-7)**

|  |  |
| --- | --- |
| Name |  |
| Title |  |
| Phone |  |
| Email |  |

**Section 6: Certification and Signature**

|  |  |  |
| --- | --- | --- |
| I, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (insert name)­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(insert title)DECLARE that I am authorised by the Applicant to submit this Self-Assessment on the Applicant’s behalf and CERTIFY that the contents of this Self-Assessment and any attachments are true and correct.

|  |  |
| --- | --- |
| Signature | ………./………./20……..Date |

 |

This form should be submitted to: PFR@aemo.com.au

Enquiries about this form should be submitted to: PFR@aemo.com.au

1. PRIMARY FREQUENCY RESPONSE REQUIREMENTS PROPOSED PFR SETTINGS

**Section 1: Connection Applicant**

|  |  |
| --- | --- |
| Applicant |  |
| ABN |  |

**Section 2: Proposed Generating System & Local Network Service Provider (LNSP)**

|  |  |
| --- | --- |
| Name |  |
| DUID |  |
| Connection Point |  |
| Proposed Capacity  |  |
| Technology |  |
| LNSP |  |

**Section 3: Proposed PFR Settings**

|  |  |
| --- | --- |
| Deadband |  |
| Droop |  |
| Response Time |  |

**Section 5: Connection Applicant Contacts for Queries**[[7]](#footnote-8)

|  |  |
| --- | --- |
| Name |  |
| Title |  |
| Phone |  |
| Email |  |

**Section 6: Certification and Signature**

|  |  |  |
| --- | --- | --- |
| I, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (insert name)­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(insert title)DECLARE that I am authorised by the Applicant to submit this Self-Assessment on the Applicant’s behalf and CERTIFY that the contents of this Self-Assessment and any attachments are true and correct.

|  |  |
| --- | --- |
| Signature | ………./………./20……..Date |

 |

This form should be submitted to: PFR@aemo.com.au

Enquiries about this form should be submitted to: PFR@aemo.com.au

1. PRIMARY FREQUENCY RESPONSE REQUIREMENTS AEMO response to affected generator

[on AEMO letterhead]

[Name and address of Affected Generator]

Dear [insert as appropriate],

**Interim Primary Frequency Response Requirements – Notice of PFR Settings**

Further to your recent self-assessment/application for variation/application to change PFR Settings [delete whichever is inapplicable], AEMO has assessed the information provided by you and confirms that the PFR Settings[[8]](#footnote-9) for each Affected GS you own/operate and the date from which provision of PFR must commence is as detailed in Attachment 1.

Please ensure you understand the performance requirements as they apply to each Affected GS, as specified in the PFRR and note your obligations to advise AEMO of any non-compliance.

Should you wish to vary any of these PFR Settings, please refer to the PFRR for the application process.

Any queries should be addressed to [insert particulars].

Yours sincerely,

[insert name and title]

Attachment 1 - PFR Settings

| Generating System DUID | Commencement Date | Deadband | Droop | Response Time | Conditions[[9]](#footnote-10) |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

1. PRIMARY FREQUENCY RESPONSE REQUIREMENTS APPLICATION FOR EXEMPTION

**Section 1: Applicant**

|  |  |
| --- | --- |
| Applicant |  |
| ABN |  |

**Section 2: Generating System & Local Network Service Provider (LNSP)**

|  |  |
| --- | --- |
| Name |  |
| DUID |  |
| Connection Point |  |
| LNSP |  |

The Applicant seeks exemption from the requirement to operating the Generating System in accordance with all PFRP on the following grounds:

**Section 3: Grounds for Exemption:**

|  |
| --- |
| Provide details of basis for exemption and attach any relevant evidence. See section 7.1 for details. |

**Section 4: Supporting Information**

Attach supporting information. See section 7.1 for details of the type of information to be provided.

**Section 5: Applicant Contacts for Queries[[10]](#footnote-11)**

|  |  |
| --- | --- |
| Name |  |
| Title |  |
| Phone |  |
| Email |  |

**Section 6: Certification and Signature**

|  |  |  |
| --- | --- | --- |
| I, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (insert name)­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(insert title)DECLARE that I am authorised by the Applicant to submit this Application on the Applicant’s behalf and CERTIFY that the contents of this Application and any attachments are true and correct.

|  |  |
| --- | --- |
| Signature | ………./………./20……Date |

 |

This form should be submitted to PFRR@aemo.com.au

Enquiries about this form should be submitted to PFRR@aemo.com.au

1. PRIMARY FREQUENCY RESPONSE REQUIREMENTS APPLICATION FOR variation

**Section 1: Applicant**

|  |  |
| --- | --- |
| Applicant |  |
| ABN |  |

**Section 2: Generating System & Local Network Service Provider (LNSP)**

|  |  |
| --- | --- |
| Name |  |
| DUID |  |
| Connection Point |  |
| LNSP |  |

The Applicant seeks a variation from some of the PFRP.

**Section 3: Variations Requested**

For each item, indicate the changes need to meet the relevant PFRP.

|  |  |
| --- | --- |
| Deadband |  |
| Droop |  |
| Speed of Response |  |
| Range of Response  |  |
| Continuity of Response |  |

**Section 4: Supporting Information**

Attach supporting information for each variation requested. See section 7.1 for details of the type of information to be provided.

**Section 5: Applicant Contacts for Queries[[11]](#footnote-12)**

|  |  |
| --- | --- |
| Name |  |
| Title |  |
| Phone |  |
| Email |  |

**Section 6: Certification and Signature**

|  |  |  |
| --- | --- | --- |
| I, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (insert name)­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(insert title)DECLARE that I am authorised by the Applicant to submit this Application on the Applicant’s behalf and CERTIFY that the contents of this Application and any attachments are true and correct.

|  |  |
| --- | --- |
| Signature | ………./………./20……Date |

 |

This form should be submitted to PFRR@aemo.com.au

Enquiries about this form should be submitted to PFRR@aemo.com.au

1. PRIMARY FREQUENCY RESPONSE REQUIREMENTS AEMO RESPONSE TO APPLICATION FOR EXEMPTION/VARIATION

[on AEMO letterhead]

[Name and address of Affected Generator]

Dear [insert as appropriate],

**Interim Primary Frequency Response Requirements – Exemption/Variation [delete whichever is inapplicable] of [insert name of Affected GS]**

Further to your recent application for exemption/variation [delete as applicable] of [insert name of Affected GS] from the requirements of the Interim Primary Frequency Response Requirements (**IPFRR**) [[12]](#footnote-13), AEMO has assessed the information provided by you and had decided to grant/not grant [delete as applicable] your application for exemption/variation [delete as applicable] on the following grounds/conditions [delete as applicable]:

* [insert grounds/conditions – adjust as necessary if no conditions]

[If granting variation to requirements, confirm PFR Settings as follows]

Therefore, the PFR Settings for [insert name of Affected GS] are as follows:

|  |  |
| --- | --- |
| Deadband |  |
| Droop | Under-Frequency Response |  |
| Over-Frequency Response |  |
| Response Time |  |

[Next two paragraphs not needed for exemptions]

Please ensure you understand the performance requirements as they apply to each Affected GS, as specified in the PFRR and note your obligations to advise AEMO of any non-compliance.

Should you wish to vary any of these PFR Settings, please refer to the PFRR for the application process.

Any queries should be addressed to [insert particulars].

Yours sincerely,

[insert name and title]

1. Measured from the commencement date of this document. [↑](#footnote-ref-2)
2. GPS Compliance Assessment And R2 Model Validation Test Plan Template For Conventional Synchronous Machines. AEMO, May 2016. Available at: <https://www.aemo.com.au/-/media/Files/Electricity/NEM/Network_Connections/Transmission-and-Distribution/Generating-System-Test-Plan-Template-for-Conventional-Synchronous-Machines.pdf> and GPS Compliance Assessment And R2 Model Validation Test Plan Template For Power Electronic Interfaced Nonsynchronous Generation Technologies. AEMO, September 2016. Available at: https://www.aemo.com.au/-/media/Files/Electricity/NEM/Network\_Connections/Transmission-and-Distribution/Generating-System-Test-Template-for-Non-Synchronous-Generation.pdf [↑](#footnote-ref-3)
3. Cut and paste for each Affected GS. [↑](#footnote-ref-4)
4. For example, control block diagrams and simulated, or physical, test reports, past commissioning test results relevant to PFR, any OEM governor block diagrams along with tuned data, any document describing how the GS is operated to provide FCAS. [↑](#footnote-ref-5)
5. Copy and paste table for each Affected GS. [↑](#footnote-ref-6)
6. Copy and paste table to insert more names if more than one contact. [↑](#footnote-ref-7)
7. Copy and paste table to insert more names if more than one contact. [↑](#footnote-ref-8)
8. Capitalised terms are defined in the Interim Primary Frequency Response Requirements (IPFRR). [↑](#footnote-ref-9)
9. You may insert attachments if lengthy. [↑](#footnote-ref-10)
10. Copy and paste table to insert more names if more than one contact. [↑](#footnote-ref-11)
11. Copy and paste table to insert more names if more than one contact. [↑](#footnote-ref-12)
12. Capitalised terms are defined in the IPFRR. [↑](#footnote-ref-13)