



Draft National Electricity Amendment (Managing the rate of change of power system frequency) Rule 2017

under the National Electricity Law to the extent applied by:

- (a) the National Electricity (South Australia) Act 1996 of South Australia;
- (b) the Electricity (National Scheme) Act 1997 of the Australian Capital Territory;
- (c) the Electricity - National Scheme (Queensland) Act 1997 of Queensland;
- (d) the Electricity - National Scheme (Tasmania) Act 1999 of Tasmania;
- (e) the National Electricity (New South Wales) Act 1997 of New South Wales;
- (f) the National Electricity (Victoria) Act 2005 of Victoria;
- (g) the National Electricity (Northern Territory)(National Uniform Legislation) Act 2015; and
- (h) the Australian Energy Market Act 2004 of the Commonwealth.

The Australian Energy Market Commission makes the following Rule under the National Electricity Law.

John Pierce
Chairman
Australian Energy Market Commission

Draft National Electricity Amendment (Managing the rate of change of power system frequency) Rule 2017

1 Title of Rule

This Rule is the *Draft National Electricity Amendment (Managing the rate of change of power system frequency) Rule 2017*.

2 Commencement

Schedule [x](the savings and transitional schedule) commences operation on [date rule is made].

Schedules 1 to [x] commence operation on [1 July 2018].

3 Amendment of the National Electricity Rules

The National Electricity Rules are amended as set out in Schedule 1.

4 Amendment of the National Electricity Rules

The National Electricity Rules are amended as set out in Schedule 2.

5 Amendment of the National Electricity Rules

The National Electricity Rules are amended as set out in Schedule 3.

6 Amendment of the National Electricity Rules

The National Electricity Rules are amended as set out in Schedule 4.

7 Savings and Transitional Amendments to the National Electricity Rules

The National Electricity Rules are amended as set out in Schedule 5.

Schedule 1 Amendment to the National Electricity Rules

(Clause 3)

[1] Clause 3.9.7 Pricing for constrained -on scheduled generating units

After clause 3.9.7(b), insert:

- (c) In the event that an *inertia network service* under an *inertia services agreement* is *enabled* such that an *inertia generating unit* is *constrained on* in any *dispatch interval* to provide *inertia*, that *inertia generating unit* must comply with *dispatch instructions* from *AEMO* in accordance with its availability as specified in its *dispatch offer* but may not be taken into account in the determination of the *dispatch price* in that *dispatch interval* except to the extent that the *inertia generating unit* is *dispatched* at a level above its minimum *loading level*.

Note

The AEMC proposes to recommend that this clause be classified as a civil penalty provision under the National Electricity (South Australia) Regulations.

- (d) A *Scheduled Generator* that is *constrained on* in accordance with paragraph (c) is not entitled to receive from *AEMO* any compensation due to its *dispatch price* being less than its *dispatch offer price*.

[2] Clause 3.13.3 Standing data

In clause 3.13.3(q)(4) omit the second occurrence of "and".

[3] Clause 3.13.3 Standing data

In clause 3.13.3(q)(5)(ii) omit "." and substitute "; and".

[4] Clause 3.13.3 Standing data

After clause 3.13.3(q)(5), insert:

- (6) projections of *inertia shortfalls* in *inertia sub-networks*.

Schedule 2 Amendment to the National Electricity Rules

(Clause4)

[1] Clause 4.1.1 Purpose

In clause 4.1.1(a)(3)(iv) after "AEMO", insert "and for AEMO to *enable inertia network services*."

[2] Clause 4.2.5 Technical envelope

In clause 4.2.5(c)(7) after "requirements" insert "and *inertia network service availability*"

[3] Clause 4.2.6 General principles for maintaining power system security

After clause 4.2.6(e), insert:

- (f) Sufficient *inertia* should be available in each *inertia sub-network* to meet the applicable *inertia requirements*.

[4] Clause 4.3.1 Responsibility of AEMO for power system security

In clause 4.3.1(o) after "*ancillary services*", insert "or *inertia network services*"

[5] Clause 4.3.1 Responsibility of AEMO for power system security

After clause 4.3.1(pa), insert:

- (pb) to determine the boundaries of *inertia sub-networks* and the *inertia requirements* for each *inertia sub-network* and to *enable inertia network services*;

[6] Clause 4.3.4 Network Service Providers

After clause 4.3.4(i), insert:

- (j) Each *Transmission Network Service Provider* that is an *Inertia Service Provider* for an *inertia sub-network* must make *inertia network services* available to AEMO in the *inertia sub-network* in accordance with clause 5.20B.4(b).

Note

The AEMC proposes to recommend that this clause be classified as a civil penalty provision under the National Electricity (South Australia) Regulations.

- (k) Each *Transmission Network Service Provider* that is an *Inertia Service Provider* must give *AEMO* information about *inertia network services* made available by the *Inertia Service Provider* in accordance with clause 5.20B.6 and must update *AEMO* if there is a material change to the information provided to *AEMO* under that clause.

Note

The AEMC proposes to recommend that this clause be classified as a civil penalty provision under the National Electricity (South Australia) Regulations.

[7] New Clause 4.4.4 Instructions to enable inertia network services

After clause 4.4.3, insert:

4.4.4 Instructions to enable inertia network services

- (a) Where a *contingency event* that would result in the *islanding* of an *inertia sub-network* has been classified as a *credible contingency event* or defined as a *protected event* *AEMO* may at any time require a range and quantity of *inertia network services* to be *enabled* to maintain the *minimum threshold level of inertia* in an *inertia sub-network* at any time while the circumstances referred to in this paragraph continue.
- (b) Where an *inertia sub-network* is *islanded*:
- (1) *AEMO* may *enable* a range and quantity of *inertia network services* that will provide *inertia* to the *inertia sub-network* to the level determined under subparagraph (2) at any time while the *inertia sub-network* remains *islanded*; and
 - (2) the level of *inertia* referred to in subparagraph (1) is:
 - (i) the *secure operating level of inertia* for the *inertia sub-network*; or
 - (ii) if the *secure operating level of inertia* for the *inertia sub-network* has been adjusted for activities approved by *AEMO* under clause 5.20B.5(a), that adjusted level of *inertia*.
- (c) In selecting the *inertia network services* to be *enabled* under paragraph (a) or (b), *AEMO* must use reasonable endeavours to select services higher in the order of priority specified by the *Inertia Service Provider* in its schedule of *inertia network services* given to *AEMO* under clause 5.20B.6(a) before services lower in the order of priority.

- (d) For the purposes of paragraphs (a) and (b), *AEMO* may at any time give an instruction to a *Registered Participant* who has agreed with the *Transmission Network Service Provider* to provide *inertia network services* stating that *AEMO* requires *inertia network services* to be *enabled*. Where the *inertia network services* are provided by an *inertia generating unit*, the instruction must be given in accordance with the procedures for giving instructions to *generating units* under the *Rules*. Otherwise, the instruction must be given in accordance with the information about giving instructions applicable to the *inertia network service* approved by *AEMO* under clause 5.20B.6(e).
- (e) *AEMO* may at any time give an instruction stating that *AEMO* requires the provision of an *inertia network service* to cease. The instruction must be given in the manner provided for in paragraph (d).
- (f) An instruction to *enable* or cease providing *inertia network services* must include:
 - (1) specific reference to the *inertia network service* to which the instruction applies;
 - (2) the time the instruction is issued; and
 - (3) the time at which the service is to be *enabled* or cease, if that is different from the time the instruction is issued.
- (g) A *Registered Participant* providing an *inertia network service* must comply with an instruction given under paragraph (d) or (e) in accordance with the *Rules* and any information approved by *AEMO* under clause 5.20B.6(e), as applicable.

Note

The AEMC proposes to recommend that this clause be classified as a civil penalty provision under the National Electricity (South Australia) Regulations.

- (h) A *Registered Participant* providing an *inertia network service* must ensure that appropriate personnel or electronic facilities are available at all times to receive and immediately act upon instructions issued by *AEMO* to *enable* the *inertia network service* or cease providing it.

Note

The AEMC proposes to recommend that this clause be classified as a civil penalty provision under the National Electricity (South Australia) Regulations.

[8] New Clause 4.9.9C Inertia network service availability changes

After clause 4.9.9B, insert:

4.9.9C Inertia network service availability changes

An *Inertia Service Provider* must, without delay, notify *AEMO* of any event which has changed or is likely to change the availability of any *inertia network service* in the schedule of *inertia network services* provided by the *Inertia Service Provider* to *AEMO* under clause 5.20B.6(a), as soon as the *Inertia Service Provider* becomes aware of the event.

Note

The AEMC proposes to recommend this clause be classified as a civil penalty provision under the National Electricity (South Australia) Regulations.

[9] Clause 4.10.2 Transmission network operations

In clause 4.10.2(c) after "*network support agreement*", insert ", *inertia services agreement*".

[10] Clause 4.11.1 Remote control and monitoring devices

In clause 4.11.1(b) after "*ancillary services*", insert "or *inertia network services*".

Schedule 3 Amendment to the National Electricity Rules

(Clause 5)

[1] Clause 5.1A.1 Purpose and Application

After clause 5.1A.1(f)(5), insert:

- (6) rule 5.20B.

[2] Clause 5.10.1 Content of Part D

After clause 5.10.1(m), insert:

- (m1) Clause 5.20B sets out the process for identifying and providing the *inertia requirements of inertia sub-networks*.

[3] Clause 5.12.2 Transmission Annual Planning Report

Omit clause 5.12.2(c)(8) and substitute:

- (8) any information required to be included in an *Transmission Annual Planning Report* under:
 - (i) clause 5.16.3(c) in relation to a *network* investment which is determined to be required to address an urgent and unforeseen *network* issue; or
 - (ii) clause 5.20B.4(g) in relation to *network* investment and other activities to provide *inertia network services*;

[4] Clause 5.16.1 Principles

In clause 5.16.1(b) after "corrective action", insert "or the provision of *inertia network services* required under clause 5.20B.4."

[5] Clause 5.16.3 Investments subject to the regulatory investment test for transmission

In clause 5.16.3(a)(7) omit "or".

[6] Clause 5.16.3 Investments subject to the regulatory investment test for transmission

In clause 5.16.3(a)(8) after "(including replacement transmission network assets)", insert "; or'.

[7] Clause 5.16.3 Investments subject to the regulatory investment test for transmission

After clause 5.16.3(a)(8), insert:

- (9) the proposed expenditure is an *inertia support payment*.

[8] Clause 5.16.3 Investments subject to the regulatory investment test for transmission

In clause 5.16.3(d), omit “subparagraphs (a)(1)-(7)” and substitute “paragraph (a)”.

[9] Clause 5.20.2 Publication of NTNDP

In clause 5.20.2(c)(12) omit "." and substitute "; and"

[10] Clause 5.20.2 Publication of NTNDP

After clause 5.20.2(c)(12), insert:

- (13) describe the boundaries of the *inertia sub-networks* and related *inertia requirements* determined by *AEMO* under rule 5.20B and if in *AEMO*'s assessment there is an *inertia shortfall* or an *inertia shortfall* has been remedied, the other matters required under clause 5.20B.3(c) or (d) as applicable.

[11] New Rule 5.20B Inertia sub-networks and requirements

After rule 5.20A, insert:

5.20B Inertia sub-networks and requirements

5.20B.1 Boundaries of inertia sub-networks

- (a) For the purpose of determining the required levels of *inertia* in the *national grid*, the *connected transmission systems* forming part of the *national grid* are to be divided into *inertia sub-networks*.
- (b) *AEMO* must determine the boundaries of *inertia sub-networks* and may from time to time adjust the boundaries, including adjustments that result in new *inertia sub-networks*.
- (c) The boundaries of an *inertia sub-network* must be aligned with the boundaries of a *region* or wholly confined within a *region*.
- (d) Subject to paragraph (c), in determining and adjusting the boundaries of *inertia sub-networks*, *AEMO* must take into account the following matters:
- (1) *connections* between the proposed *inertia sub-network* and adjacent parts of the *national grid*;
- (2) the likelihood of the proposed *inertia sub-network* being *islanded*; and

- (3) the criticality and practicality of maintaining the proposed *inertia sub-network* in a *satisfactory operating state* if it is *islanded* and being able to return to a *secure operating state* while *islanded*.
- (e) In determining and adjusting the boundaries of *inertia sub-networks*, *AEMO* must comply with the *Rules consultation procedures*.
- (f) *AEMO* must *publish* the boundaries of the *inertia sub-networks* and any adjustments in the *NTNDP*.

5.20B.2 Inertia requirements

- (a) The *inertia requirements* to be determined for each *inertia sub-network* are:
 - (1) the *minimum threshold level of inertia*, being the minimum level of *inertia* required to operate the *inertia sub-network* in a *satisfactory operating state* when the *inertia sub-network* is *islanded*; and
 - (2) the *secure operating level of inertia*, being the minimum level of *inertia* required to operate the *inertia sub-network* in a *secure operating state* when the *inertia sub-network* is *islanded*.
- (b) *AEMO* must develop and publish and may amend an *inertia requirements procedure* setting out the process it will use to determine the *inertia requirements* for each *inertia sub-network*. In developing and amending the *inertia requirements procedure*, *AEMO* must comply with the *Rules consultation procedures*.
- (c) The *inertia requirements procedure* must provide for *AEMO* to take the following matters into account in determining the *secure operating level of inertia*:
 - (1) the capabilities and expected response times provided by *generating units* providing *market ancillary services* (other than the *regulating raise service* or *regulating lower service*) in the *inertia sub-network*;
 - (2) the maximum *load shedding* or *generation shedding* expected to occur on the occurrence of any *credible contingency event* affecting the *inertia sub-network* when the *inertia sub-network* is *islanded*; and
 - (3) additional *inertia* needed to account for the possibility of a reduction in *inertia* if the *contingency event* that occurs is the loss of a *synchronous generating unit*.

- (d) *AEMO* must from time to time determine the *inertia requirements* for *inertia sub-networks* applying the *inertia requirements procedure*. *AEMO* must make a determination under this paragraph:
 - (1) subject to subparagraph (2) and any other requirements under the *Rules*, for any *inertia sub-network*, no more than once in every 12 month period; and
 - (2) for each affected *inertia sub-network*, as soon as reasonably practical after becoming aware of a major unforeseen change to the *power system* likely to affect the *inertia requirements* for the *inertia sub-network* (such as retirement of a *synchronous generating unit*).
- (e) *AEMO* must *publish* the *inertia requirements* determined for each *inertia sub-network* in the *NTNDP* together with the results of its assessment under clause 5.20B.3.

5.20B.3 Inertia shortfalls

- (a) *AEMO* must immediately following its determination of the *inertia requirements* for an *inertia sub-network* under clause 5.20B.2(d) assess:
 - (1) the level of *inertia* typically provided in the *inertia sub-network* having regard to typical patterns of *dispatched generation in central dispatch*;
 - (2) whether in *AEMO*'s reasonable opinion, there is or is likely to be an *inertia shortfall* in the *inertia sub-network*; and
 - (3) where *AEMO* has previously assessed that there was or was likely to be an *inertia shortfall*, whether in *AEMO*'s reasonable opinion that *inertia shortfall* has been or will be remedied.
- (b) In making its assessment under subparagraph (a)(2) for an *inertia sub-network*, *AEMO* must take into account:
 - (1) when *AEMO* reasonably expects that the levels of *inertia* that are typically provided in the *inertia sub-network* will fall below the *secure operating level of inertia*;
 - (2) over what time period and to what extent the *inertia* that is typically provided in the *inertia sub-network* is or is likely to be below the *secure operating level of inertia*;
 - (3) the levels of *inertia* that are typically provided in adjacent *connected inertia sub-networks* and the likelihood of the *inertia sub-network* becoming *islanded*; and

- (4) any other matters that *AEMO* reasonably considers to be relevant in making its assessment.
- (c) If *AEMO* assesses that there is or is likely to be an *inertia shortfall* in any *inertia sub-network*, *AEMO* must:
 - (1) give notice of that assessment in its *NTNDP*;
 - (2) specify the identity of the *Inertia Service Provider* for the *inertia sub-network* as determined under clause 5.20B.4(a); and
 - (3) specify the date by which the *Inertia Service Provider* referred to in subparagraph (2) must ensure the availability of *inertia network services* in accordance with clause 5.20B.4(b), which must not be earlier than 12 months after the *NTNDP* is published.
- (d) If *AEMO* assesses that an *inertia shortfall* in an *inertia sub-network* has been or will be remedied, *AEMO* must:
 - (1) give notice of that assessment in its *NTNDP*; and
 - (2) specify the date from which the obligation of the relevant *Inertia Service Provider* under clause 5.20B.4(b) ceases, which must not be earlier than 12 months after the *NTNDP* is published.

5.20B.4 Inertia Service Provider to make available inertia services

- (a) The *Inertia Service Provider* for an *inertia sub-network* is:
 - (1) the *Transmission Network Service Provider* for the *inertia sub-network*; or
 - (2) if there is more than one *Transmission Network Service Provider* for the *inertia sub-network*, the *jurisdictional planning body* for the *participating jurisdiction* in which the *inertia sub-network* is located.
- (b) If *AEMO* gives notice in an *NTNDP* under clause 5.20B.3(c)(1) that *AEMO* has assessed that there is or is likely to be an *inertia shortfall* in an *inertia sub-network*, the *Inertia Service Provider* for the *inertia sub-network* must make *inertia network services* available in accordance with paragraph (c) that when *enabled* will provide *inertia* to:
 - (1) the *secure operating level of inertia*; or

- (2) the *secure operating level of inertia* as adjusted in accordance with any agreement with *AEMO* under clause 5.20B.5(a), but not less than the *minimum threshold level of inertia*.
- (c) For the purposes of paragraph (b), an *Inertia Service Provider* for an *inertia sub-network* must:
- (1) make the *inertia network services* available by the date specified by *AEMO* in the *NTNDP* under clause 5.20B.3(c)(3);
 - (2) make a range and level of *inertia network services* available such that it is reasonably likely that *inertia network services* that provide the required level of *inertia* when *enabled* are continuously available, taking into account planned *outages* and the risk of unplanned *outages*;
 - (3) ensure that the *inertia network services* that when *enabled* provide *inertia* up to the *minimum threshold level of inertia* are qualifying *inertia network services* as specified in paragraph (d);
 - (4) ensure that the *inertia network services* that when *enabled* provide *inertia* beyond the *minimum threshold level of inertia* up to the *secure operating level of inertia* or where applicable, the *secure operating level of inertia* as adjusted by agreement with *AEMO* under clause 5.20B.5(a), are qualifying *inertia network services* as specified in paragraph (e); and
 - (5) maintain the availability of those *inertia network services* until the date the *Inertia Service Provider's* obligation ceases, as specified by *AEMO* under clause 5.20B.3(d)(2).
- (d) The *inertia network services* that qualify to provide *inertia* up to the *minimum threshold level of inertia* are:
- (1) *inertia network services* made available by the *Inertia Service Provider* investing in its *network* through the installation, commissioning and operation of a *synchronous condenser*; and
 - (2) *inertia network services* made available to the *Inertia Service Provider* by a *Registered Participant* and provided by means of a *synchronous generating unit* or a *synchronous condenser* under an *inertia services agreement*.
- (e) The *inertia network services* that qualify to provide *inertia* beyond the *minimum threshold level of inertia* up to the *secure operating level of inertia* are:
- (1) the *inertia network services* mentioned in paragraph (d);

- (2) *inertia network services* made available by the *Inertia Service Provider* investing in its *network* other than those mentioned in paragraph (d); and
 - (3) *inertia network services* made available to the *Inertia Service Provider* by a *Registered Participant* under an *inertia services agreement* other than those mentioned in paragraph (d).
- (f) An *Inertia Service Provider* required to make *inertia network services* available under paragraph (b) must seek to identify and procure the least cost option or combination of options that will satisfy its obligation within the time specified in subparagraph (c)(1).
- (g) An *Inertia Service Provider* must provide information in its *Transmission Annual Planning Report* about the activities undertaken to satisfy its obligation to make *inertia network services* available under paragraph (b). If the *Inertia Service Provider* proposes *network* investment for that purpose, the *Inertia Service Provider* must provide the following information in its next *Transmission Annual Planning Report*:
- (1) the date when the proposed relevant *network* investment became or will become operational;
 - (2) the purpose of the proposed relevant *network* investment; and
 - (3) the total cost of the proposed relevant *network* investment.
- (h) An *Inertia Service Provider* required to make *inertia network services* available under paragraph (b) may include the cost of *inertia support payments* in the calculation of *network support payments* in accordance with Chapter 6A.

5.20B.5 Other activities

- (a) *AEMO* may at the request of an *Inertia Service Provider* approve activities under this clause and agree corresponding adjustments to the *secure operating level of inertia* for the purposes of clause 5.20B.4(b)(2) where the activities:
- (1) are to be undertaken by the *Inertia Service Provider* or provided as a service to the *Inertia Service Provider*;
 - (2) are not *inertia network services*; and
 - (3) *AEMO* is satisfied the activities will contribute to operation of the *inertia sub-network* in a *secure operating state* when the *inertia sub-network* is *islanded*.

Note

If approved by *AEMO* under paragraph (a), paragraph (a) may allow activities such as installing or contracting for the provision of *frequency control services*, installing emergency protection schemes or contracting with *Generators* in relation to the operation of their *generating units* in specified conditions.

- (b) For the purposes of clause 5.20B.4(b)(2), an adjustment for activities approved under paragraph (a) will apply to the level determined by *AEMO* and only where and to the extent that the approved activity is *enabled* and performing in accordance with the conditions of any approval determined by *AEMO*.
- (c) An *Inertia Service Provider* making a request under paragraph (a) must give *AEMO*:
 - (1) details of the proposed activity and the other information about the proposed activity consistent with the requirements of clause 5.20B.6(c);
 - (2) the proposed technical specification and performance standards and the information necessary for *AEMO* to give instructions to *enable* the activity consistent with the requirements of clause 5.20B.6(d);
 - (3) information about how the activity will contribute to operation of the *inertia sub-network* in a *secure operating state* when the *inertia sub-network* is *islanded*;
 - (4) the *Inertia Service Provider's* proposal for calculating adjustments to be made and the times they will apply; and
 - (5) any other information requested by *AEMO* in connection with the request.
- (d) *AEMO* may give or withhold its approval under this clause in its discretion and subject to any conditions determined by *AEMO*.
- (e) The technical specification, performance standards and information necessary for *AEMO* to give instructions referred to in paragraph (c)(2) and any change to them must be approved by *AEMO*.
- (f) An *Inertia Service Provider* must obtain *AEMO's* approval under paragraph (a) before any change to the technical specification, performance standards or procedures to give instructions that apply to an activity approved under paragraph (a) comes into effect.

Note

The AEMC proposes to recommend that this clause be classified as a civil penalty provision under the National Electricity (South Australia) Regulations.

5.20B.6 Inertia network services information and approvals

- (a) An *Inertia Service Provider* required to make *inertia network services* available under clause 5.20B.4(b) must prepare and give to *AEMO* and keep up to date, a schedule setting out:
 - (1) the *inertia network services* available in the *inertia sub-network* and the approved activities (if any) under clause 5.20B.5(a); and
 - (2) the *Inertia Service Provider's* proposed order of priority for the *inertia network services* and approved activities to be *enabled*.
- (b) Where the *Inertia Service Provider* procures *inertia network services* from a *Generator* provided by means of a *synchronous generating unit* under an *inertia services agreement*, the *Inertia Service Provider* must register the *generating unit* with *AEMO* as an *inertia generating unit* and specify that the *generating unit* may be periodically used to provide *inertia network services* and will not be eligible to set *spot prices* when *constrained on* to provide *inertia* in accordance with clause 3.9.7(c).
- (c) An *Inertia Service Provider* required to make *inertia network services* available under clause 5.20B.4(b) must give to *AEMO* and keep up to date the following details for each *inertia network service*:
 - (1) a description of the *inertia network service*, including:
 - (i) the nature of the *inertia network service*;
 - (ii) the *generating unit* or other *facilities* used to provide the *inertia network service*;
 - (iii) the purpose for which the *inertia network service* is being provided;
 - (iv) the location in the *transmission network* of the *facilities* used to provide the *inertia network service*; and
 - (v) the quantity of *inertia* to be provided when the *inertia network service* is *enabled*; and
 - (2) information about the availability of the *inertia network service*, including:
 - (i) the times when, and the period over which, the *inertia network service* will be available to provide *inertia*; and

- (ii) any possible restrictions on the availability of the *inertia network service*.
- (d) An *Inertia Service Provider* required to make *inertia network services* available under clause 5.20B.4(b) must prepare and submit to *AEMO* for approval under paragraph (e) the following details for each *inertia network service*:
 - (1) the technical specification and performance standards for the *inertia network service*; and
 - (2) the information necessary for *AEMO* to give instructions to *enable* or cease the provision of the *inertia network service* including:
 - (i) the period of any notice that has to be given to the provider of the *inertia network service* for it to be *enabled*;
 - (ii) the response time to any instruction for the *inertia network service* to be *enabled* or to cease being provided; and
 - (iii) communication protocols between it, *AEMO* and the *Registered Participants* that provide *inertia network services*.
- (e) The technical specification, performance standards and information necessary for *AEMO* to give instructions referred to in paragraph (d) and any change to them must be consistent with the *Rules* and approved by *AEMO*.
- (f) An *Inertia Service Provider* must ensure that *AEMO*'s approval is obtained under paragraph (e) before the *inertia network service* is first made available and in the case of a change, before the change comes into effect.

Note

The AEMC proposes to recommend that this clause be classified as a civil penalty provision under the National Electricity (South Australia) Regulations.

- (g) *AEMO* must within 20 *business days* following the receipt of a request for approval under paragraph (e) respond to the *Inertia Service Provider* stating whether it gives its approval. If *AEMO* does not notify its approval to the *Inertia Service Provider* within that time, *AEMO* is taken to have not approved.
- (h) If *AEMO* does not approve the matters in a request for approval under paragraph (e):

- (1) *AEMO* must tell the *Inertia Service Provider* its concerns and may advise the *Inertia Service Provider* of the changes *AEMO* requires to be made; and
- (2) the *Inertia Service Provider* must amend its request to address the concerns identified by *AEMO* and submit to *AEMO* a new request for approval.

Schedule 4 Amendment to the National Electricity Rules

(6)

[1] Chapter 10 New Definitions

In Chapter 10, insert the following new definitions in alphabetical order:

inertia

Contribution to the capability of the *power system* to resist changes in *frequency* in response to a *contingency event* by means of an inertial response from a *generating unit* or *network element* that is electro-magnetically coupled with the *power system* and *synchronised* to the *frequency* of the *power system*.

inertia generating unit

A *generating unit* registered with *AEMO* under clause 5.20B.6(a).

inertia network service

A service for the provision of *inertia* to a *transmission system*.

inertia requirements

The *minimum threshold level of inertia* and the *secure operating level of inertia* .

inertia requirements procedure

Procedure published by *AEMO* under clause 5.20B.2(b).

Inertia Service Provider

The *Inertia Service Provider* for an *inertia sub-network* as determined under clause 5.20B.4(a).

inertia services agreement

An agreement under which a person agrees to provide one or more *inertia network services* to an *Inertia Service Provider* or to undertake an activity approved by *AEMO* under clause 5.20B.5(a).

inertia shortfall

A shortfall in the level of *inertia* typically provided in an *inertia sub-network* (having regard to typical patterns of *dispatched generation* in *central dispatch*) compared to the *secure operating level of inertia* most recently determined by *AEMO* for the *inertia sub-network*.

inertia sub-network

A part of the *national grid* determined by *AEMO* in accordance with clause 5.20B.1.

inertia support payment

A payment by a *Transmission Network Service Provider* made under an *inertia services agreement* where:

- (a) the payment is made for *inertia network services* procured by the *Transmission Network Service Provider* in its capacity as an *Inertia Service Provider* to satisfy an obligation under clause 5.20B.4 or for undertaking an activity approved by *AEMO* under clause 5.20B.5(a); and
- (b) the *inertia network services* are provided, or the approved activity is undertaken, in accordance with:
 - (1) applicable technical specifications and performance standards approved by *AEMO*; and
 - (2) in the case of an activity approved by *AEMO* under clause 5.20B.5(a), any conditions of that approval.

islanded, islanding

In relation to an *inertia sub-network* or a combination of two or more *inertia sub-networks*, temporary loss of *connection* to adjacent *transmission systems*.

minimum threshold level of inertia

For an *inertia sub-network*, the minimum level of *inertia* determined by *AEMO* under clause 5.20B.2.

secure operating level of inertia

For an *inertia sub-network*, the minimum level of *inertia* determined by *AEMO* under clause 5.20B.2.

[2] Chapter 10 Substituted Definitions

In Chapter 10, substitute the following definitions:

constrained on

In respect of a *generating unit*, the state where, due to a *constraint* on a *network* or in order to provide *inertia network services* under an *inertia services agreement*, the output of that *generating unit* is limited above the level to which it would otherwise have been *dispatched* by *AEMO* on the basis of its *dispatch offer*.

dispatch

The act of initiating or enabling all or part of the response specified in a *dispatch bid*, *dispatch offer* or *market ancillary service offer* in respect of a *scheduled generating unit*, *semi-scheduled generating unit*, a *scheduled load*, a *scheduled network service*, an *ancillary service generating unit* or an *ancillary service load* in accordance with rule 3.8, or a *direction* or operation of capacity the subject of a *reserve contract* or an instruction under an *ancillary services agreement* or to *enable* an *inertia network service* as appropriate.

enabled, enable

A *market ancillary service* is enabled when *AEMO* has selected the relevant *generating unit* or *load* for the provision of the *market ancillary service* and has notified the relevant *Market Participant* accordingly

An *inertia network service* is enabled when *AEMO* has selected the relevant *inertia network service* and it is providing *inertia* to an *inertia sub-network*.

An activity approved by *AEMO* under clause 5.20B.5(a) is enabled when *AEMO* has selected the relevant activity and it is performing and available in accordance with any conditions of that approval.

network element

A single identifiable major component of a *transmission system* or *distribution system* involving:

- (a) an individual *transmission* or *distribution* circuit or a phase of that circuit; or
- (b) a major item of apparatus or equipment associated with the function or operation of a *transmission line*, *distribution line* or an associated *substation* or *switchyard* which may include *transformers*, circuit breakers, *synchronous condensers*, *reactive plant* and *monitoring equipment* and control equipment.

network support payment

An *inertia support payment* and a payment by a *Transmission Network Service Provider* to:

- (a) any *Generator* providing *network support services* in accordance with rule 5.3A.12; or
- (b) any other person providing a *network support service* that is an alternative to *network augmentation*.

Non-market ancillary service or NMAS

Any of the following services:

- (a) *network support and control ancillary services* and other services acquired by *Transmission Network Service Providers* under *connection agreements* or *network support agreements* to meet the service standards linked to the technical requirements of schedule 5.1 or in *applicable regulatory instruments* (but to avoid doubt, excluding *inertia network services*); and
- (b) *system restart ancillary services* and *network support and control ancillary services* acquired by *AEMO* under *ancillary services agreements*.

synchronous condensers

Apparatus or equipment similar in construction to a *generating unit* of the *synchronous generator* category, which operates at the equivalent speed of the *frequency* of the *power system*.

Schedule 5 Savings and Transitional Amendments to the National Electricity Rules

(Schedule 5)

[1] Chapter 11 Savings and Transitional Amendments to the National Electricity Rules

In Chapter 11, after Part ZZZ insert:

Part ZZZ[x] Inertia Arrangements

11.99 Rules consequential on the making of the National Electricity Amendment ([Title]) Rule 2017

11.99.1 Definitions

(a) In this rule 11.99:

Amending Rule means the National Electricity Amendment ([Title]) Rule 2017.

commencement date means the date of commencement of Schedule [x] of the Amending Rule.

new Chapter 10 means Chapter 10 as amended by the Amending Rule.

(b) Italicised terms used in this rule 11.99 have the same meaning as in new Chapter 10.

11.99.2 Inertia sub-networks

On the commencement date, *AEMO* is taken to have determined *inertia sub-networks* having the same boundaries as the boundaries of each *region* on that date.

11.99.3 Inertia requirements procedure

(a) For clause 5.20B.2(b), *AEMO* must develop and publish the *inertia requirements procedure* within 6 months of the commencement date.

(b) *AEMO* is not required to comply with the *Rules consultation procedures* for the purposes of paragraph (a).

(c) *AEMO* must within 2 years of the commencement date, review the *inertia requirements procedure* developed under paragraph (a) and in doing so must comply with the *Rules consultation procedures*.

11.99.4 Inertia requirements

- (a) *AEMO* must make a determination of the *inertia requirements* for all *inertia sub-networks* under clauses 5.20B.2(d) and make the assessments required under clause 5.20B.3(a) at the following times:
 - (1) within 7 months of the commencement date; and
 - (2) after the determination and assessment in subparagraph (1) is complete and before the publication of the *NTNDP* due to be published by 31 December 2018.
 - (b) If *AEMO* assesses that there is or is likely to be an *inertia shortfall* in any *inertia sub-network* in its assessment carried out in accordance with subparagraph (a)(1), in addition to including the information in the following *NTNDP*, *AEMO* must promptly:
 - (1) give notice of that assessment to the *Inertia Service Provider* for the *inertia sub-network*; and
 - (2) specify the date by which the *Inertia Service Provider* referred to in subparagraph (1) must ensure the availability of *inertia network services* in accordance with clause 5.20B.4(b), which must not be earlier than 1 July 2019.
 - (c) If *AEMO* gives notice to an *Inertia Service Provider* under subparagraph (b)(1) that there is or is likely to be an *inertia shortfall*, the *Inertia Service Provider* for the *inertia sub-network* must:
 - (1) make *inertia network services* available in accordance with clause 5.20B.4(b) and, subject to subparagraph (b)(2) otherwise comply with rule 5.20B as if the notice had been given in an *NTNDP*; and
 - (2) provide information in its *Transmission Annual Planning Report* due to be published by 30 June 2018 about the activities it proposes to undertake to satisfy its obligation to make *inertia network services* available, in accordance with clause 5.20B.4(g).
 - (d) *AEMO* must include the information required by clause 5.20B.4(c) and (if applicable) clause 5.20B.4(d) arising out of its determination and assessment carried out in accordance with subparagraph (a)(2) in the *NTNDP* due to be published by 31 December 2018.
-