



National Electricity Amendment (Emergency frequency control schemes) Rule 2017 No. 2

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

National Electricity Amendment (Emergency frequency control schemes) Rule 2017 No. 2

1 Title of Rule

This Rule is the *National Electricity Amendment (Emergency frequency control schemes) Rule 2017 No.2*.

2 Commencement

This Rule commences operation on 6 April 2017.

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 as amended as set out in Schedule 3.

6 Amendment of the National Electricity Rules

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

7 Amendment of the National Electricity Rules

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

8 Savings and Transitional Amendments to the National Electricity Rules

The National Electricity Rules are amended as set out in Schedule 6.

Schedule 1 Amendment to the National Electricity Rules

(Clause 3)

[1] Clause 3.9.3C Reliability standard

In clause 3.9.3C(b)(2)(i), after "*multiple contingency events*" insert ", *protected events*".

Schedule 2 Amendment to the National Electricity Rules

(Clause 4)

[1] Clause 4.1.1 Purpose

In clause 4.1.1(b), after "*load shedding procedures*" insert "and *EFCS settings schedules*".

[2] Clause 4.2.3 Credible and non-credible contingency events

Omit the clause heading and substitute:

4.2.3 Credible and non-credible contingency events and protected events

[3] Clause 4.2.3 Credible and non credible contingency events

In clause 4.2.3(f), omit [**Deleted**] and substitute:

- (f) A *protected event* means a *non-credible contingency event* that the *Reliability Panel* has declared to be a *protected event* under clause 8.8.4, where that declaration has come into effect and has not been revoked. *Protected events* are a category of *non-credible contingency event*.

[4] Clause 4.2.4 Secure operating state and power system security

In clause 4.2.4(a)(2), after "*credible contingency event*" insert "or *protected event*".

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

Omit clause 4.2.6(c), and substitute:

- (c) *Emergency frequency control schemes* should be available and in service to:
 - (1) restore the *power system* to a *satisfactory operating state* following *protected events*; and
 - (2) significantly reduce the risk of *cascading outages* and *major supply disruptions* following significant multiple *contingency events*.

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

Omit clause 4.3.1(k)(2) and substitute:

- (2) to arrest the impacts of a range of significant multiple *contingency events* (affecting up to 60% of the total *power system load*) or *protected events* to allow a prompt restoration or recovery of *power system security*, taking into account under-frequency initiated *load shedding* capability provided under *connection agreements*, by *emergency frequency control schemes* or otherwise;

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

After clause 4.3.1(p), insert:

- (pa) to coordinate the provision of *emergency frequency control schemes* by *Network Service Providers* and to determine the settings and intended sequence of response by those schemes;

[8] Clause 4.3.2 System security

Omit clause 4.3.2(f)(1)(ii) and substitute:

- (ii) the *loads* (if any) for which the approval of the *Jurisdictional System Security Coordinator* must be obtained by *AEMO* under clause 4.3.2(l); and

[9] Clause 4.3.2 System security

Omit clause 4.3.2(h) and substitute:

- (h) *AEMO* must develop, update and maintain:
 - (1) a set of procedures for each *participating jurisdiction* under which *loads* will be shed (by means other than an *emergency frequency control scheme* included in an *EFCS settings schedule*) and restored in accordance with the priorities set out in the schedules for that *participating jurisdiction* (which procedures for a *participating jurisdiction* shall be known as the *load shedding procedures* for that jurisdiction); and
 - (2) schedules for each *participating jurisdiction* specifying, for each *emergency frequency control scheme* affecting each *region* in that *participating jurisdiction*, settings for operation of the scheme including the matters specified in paragraphs (m) to (p) (which schedule for a *participating jurisdiction* shall be known as the *EFCS settings schedule* for that jurisdiction).

(ha) In developing and updating *EFCS settings schedules*, AEMO must consult with:

- (1) affected *Network Service Providers*;
- (2) the relevant *Jurisdictional System Security Coordinators*, in the case of information in the schedule relating to an *under frequency scheme*; and
- (3) affected *Generators* in the case of information in the schedule relating to an *over frequency scheme*.

[10] Clause 4.3.2 System security

In clauses 4.3.2(i) and (j), after "*load shedding procedures*" insert "and the *EFCS settings schedule*"

[11] Clause 4.3.2 System security

In clause 4.3.2(j)(1), after "*load shedding procedures*" insert "or *EFCS settings schedule*;"

[12] Clause 4.3.2 System security

In clause 4.3.2(j)(4) before "in the event of" insert "in the case of the *load shedding procedures*,".

[13] Clause 4.3.2 System security

In clause 4.3.2(l)(2), insert a space between "*relevant participating jurisdiction*" and "(which".

[14] Clause 4.3.2 System security

After clause 4.3.2(l)(2), insert:

- (3) AEMO must seek the approval of the relevant *Jurisdictional System Security Coordinator* for the order in which a *sensitive load* is to be shed and restored under an *EFCS settings schedule* (which approval must not be unreasonably withheld).
- (m) For each *under frequency scheme*, the applicable *EFCS settings schedule* must set out the manner in which *loads* are to be shed and restored.
- (n) For each *over frequency scheme*, the applicable *EFCS setting schedule* must set out the manner in which *generating units* will be interrupted or have output reduced.
- (o) AEMO must determine the matters referred to in paragraph (n) in a manner AEMO considers is best calculated to be consistent with the

power system security principles in clause 4.2.6. To that end, *AEMO* may determine a sequence and settings that will:

- (1) first, restore the *power system* to a *secure operating state*; and
 - (2) then, restore the *power system* to a *reliable operating state*.
- (p) Subject to paragraph (i), *EFCS settings schedules* are *confidential information*.

[15] Clause 4.3.4 Network Service Providers

After clause 4.3.4(b), insert:

- (b1) Each *Network Service Provider* must, in accordance with clause S5.1.10.1a of schedule 5.1, cooperate with *AEMO* in relation to, design, procure, commission, maintain, monitor, test, modify and report to *AEMO* in respect of, each *emergency frequency control scheme* which is applicable in respect of the *Network Service Provider's transmission or distribution system*.
- (b2) Where an *EFCS settings schedule* applies to an *emergency frequency control scheme*, a *Network Service Provider* must only apply, or allow the application of, settings for the *emergency frequency control scheme* that are consistent with the applicable *EFCS settings schedule*.

[16] Clause 4.3.4 Network Service Providers

After clause 4.3.4(g), insert:

- (g1) Each *Network Service Provider* must ensure that emergency controls are installed in accordance with clause S5.1.8 of schedule 5.1.

[17] Clause 4.5.1 Power system voltage control

In clause 4.5.1(b), after "*credible contingency event*" insert "*or protected event*".

[18] Clause 4.6.1 Power system fault levels

In clause 4.6.1(b), after "*credible contingency events*" insert "*and protected events*".

[19] Clause 4.8.5A Determination of the latest time for AEMO intervention

In clause 4.8.5A(g), omit "a" and substitute "an".

[20] Clause 4.8.5B Notifications of last time of AEMO intervention

In clause 4.8.5B, omit "a" and substitute "an".

[21] Clause 4.8.5B Notifications of last time of AEMO intervention

In clauses 4.8.5B(1)(ii) and 4.8.5B(2), omit "a" and substitute "an".

[22] Clause 4.10.1 Power system operating procedures

In clause 4.10.1(a)(3), omit "regional specific" and substitute "*regional specific*".

[23] Clause 4.10.1 Power system operating procedures

In clause 4.10.1(a)(3), after "*sensitive loads*" insert "and *emergency frequency control schemes*";".

[24] Clause 4.10.1 Power system operating procedures

In clause 4.10.1(a)(4), after "*load shedding procedures*" insert "and *EFCS settings schedules*"

[25] Clause 4.10.1 Power system operating procedures

In clause 4.10.1(c), after "*load shedding procedures*" insert "and *EFCS settings schedules*."

[26] Clause 4.14 Acceptance of performance standards

In rule 4.14(q), omit the second occurrence of "a" and substitute "an".

Schedule 3 Amendment to the National Electricity Rules

(Clause 5)

[1] Clause 5.9.3 Involuntary disconnection

After clause 5.9.3(c), insert:

- (d) *A Registered Participant's facilities or market loads may be disconnected from a network by automatic operation of an emergency frequency control scheme.*

[2] Clause 5.9.6 Obligation to reconnect

After clause 5.9.6(a)(3)(iv), insert

- (4) *AEMO is reasonably satisfied that there no longer exists the power system conditions due to which the Registered Participant's facilities or loads were disconnected by operation of an emergency frequency control scheme.*

[3] Clause 5.10.1 Content of Part B

In clause 5.10.1 renumber clauses (m) and (n) as (n) and (o) respectively.

[4] Clause 5.10.1 Content of Part B

In clause 5.10.1 insert a new clause 5.10.1(m):

- (m) *Clause 5.20A relates to power system frequency management planning.*

[5] Clause 5.10.2 Definitions

In clause 5.10.2, insert the following definition in alphabetical order:

In this Part B and schedules 5.8 and 5.9:

protected event EFCS investment means investment by a *Transmission Network Service Provider* or a *Distribution Network Service Provider* for the purposes of installing or modifying an *emergency frequency control scheme* applicable in respect of the *Network Service Provider's transmission or distribution system* in accordance with a *protected event EFCS standard*.

[6] Clause 5.12.1 Transmission annual planning review

Omit clause 5.12.1(b)(3) and substitute:

- (3) *take into account the most recent NTNDP and power system frequency risk review; and*

[7] Clause 5.12.2 Transmission Annual Planning Report

After clause 5.12.2(c)(6), insert:

- (6A) for proposed new or modified *emergency frequency control schemes*, the manner in which the project relates to the most recent *power system frequency risk review*;

[8] Clause 5.12.2 Transmission annual planning report

In clause 5.12.2(c)(7)(v), omit "and".

[9] Clause 5.12.2 Transmission Annual Planning Report

In clause 5.12.2(c)(8), after "*network issue*" insert ";"

[10] Clause 5.12.2 Transmission Annual Planning Report

After clause 5.12.2(c)(8), insert:

- (9) emergency controls in place under clause S5.1.8, including the *Network Service Provider's* assessment of the need for new or altered emergency controls under that clause; and
- (10) *facilities* in place under clause S5.1.10.

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

In clause 5.16.3(a)(6), omit "or".

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

In clause 5.16.3(a)(7), omit "." and substitute "; or".

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

After clause 5.16.3(a)(7), insert:

- (8) the proposed expenditure relates to protected event EFCS investment and is not intended to *augment the transmission network* (including replacement transmission network assets).

[14] Clause 5.17.3 Projects subject to the regulatory investment test for distribution

In clause 5.17.3(a)(6), omit "." and substitute "; or".

[15] Clause 5.17.3 Projects subject to the regulatory investment test for distribution

After clause 5.17.3(a)(6), insert:

- (7) the proposed expenditure relates to protected event EFCS investment and is not intended to *augment a network*.

[16] New Rule 5.20A Frequency management planning

After clause 5.20.6, insert:

5.20A Frequency management planning

5.20A.1 Power system frequency risk review

- (a) *AEMO* must, through a *power system frequency risk review* under this rule, review:
 - (1) *non-credible contingency events* the occurrence of which *AEMO* expects would be likely to involve uncontrolled increases or decreases in *frequency* (alone or in combination) leading to *cascading outages*, or *major supply disruptions*;
 - (2) current arrangements for management of the *non-credible contingency events* described in sub-paragraph (1); and
 - (3) options for future management of those events.
- (b) the options referred to in subparagraph (a)(3) may include:
 - (1) new or modified *emergency frequency control schemes*;
 - (2) declaration of the event as a *protected event*;
 - (3) *network augmentation*; and
 - (4) *non-network* alternatives to *augmentation*.
- (c) a *power system frequency risk review* must:
 - (1) identify *non-credible contingency events* referred to in paragraph (a) that *AEMO* considers should be priorities for assessment having regard to:
 - (i) the likely *power system security* outcomes if the event occurs;
 - (ii) the likelihood of the event occurring;
 - (iii) whether in *AEMO*'s opinion there are reasonably likely to be options for management of the event that are

technically feasible, and (on the basis of *AEMO's* preliminary assessment of the estimated costs and benefits of that option) are economically feasible; and

- (iv) other factors that *AEMO* considers relevant;
- (2) for events identified under subparagraph (1):
- (i) assess options for future management of the event that are technically and economically feasible;
 - (ii) assess the expected costs and time for implementation of each option and any other factors that *AEMO* considers should be taken into account in selecting a recommended option; and
 - (iii) identify the recommended option or range of options;
- (3) for current *protected events*:
- (i) assess the adequacy and costs of the arrangements for management of the event;
 - (ii) consider whether to recommend a request to the *Reliability Panel* to revoke the declaration of the event as a *protected event*; and
 - (iii) except where a recommendation is to be made under subparagraph (ii), identify any need for changes to the arrangements for management of the event and where applicable, identify the options for change and in relation to each option, the matters referred to in subparagraphs (2)(ii) and (iii); and
- (4) assess the performance of existing *emergency frequency control schemes* and identify any need to modify the scheme.

5.20A.2 Power system frequency risk review process

- (a) *AEMO* must undertake a *power system frequency risk review* at least every two years.
- (b) *AEMO* must put in place arrangements it considers appropriate to consult with and take into account the views of *Transmission Network Service Providers* in the conduct of a *power system frequency risk review*.
- (c) Where *AEMO* is considering a new or modified *emergency frequency control scheme*, *AEMO* must consult with *Distribution Network Service Providers* whose *distribution system* is likely to be directly affected by the scheme.

- (d) When undertaking a *power system frequency risk review*, AEMO may consult with any other parties it considers appropriate, including without limitation, *Jurisdictional System Security Coordinators*.

5.20A.3 Power system frequency risk review report

- (a) On completion of a *power system frequency risk review*, AEMO must publish a draft report setting out its findings and recommendations on the matters set out in clause 5.20A.1, and invite written submissions to be made within a period of at least 10 *business days* specified in the invitation. AEMO must publish its final report as soon as reasonably practicable following the receipt of submissions.
- (b) Where a *power system frequency risk review* identifies the need for a new or modified *emergency frequency control scheme* (alone or in combination with the declaration of a *protected event*) the report under this clause must:
 - (1) specify the areas of the *power system* to which the *emergency frequency control scheme* will apply and whether it is an *over frequency scheme*, *under frequency scheme*, or both; and
 - (2) include the anticipated time required to design, procure and commission the new or modified scheme.
- (c) Where, as the result of a *power system frequency risk review*, AEMO recommends seeking declaration or revocation of a *non-credible contingency event* as a *protected event*, the report under this clause must include the proposed timetable for submission of a request to the *Reliability Panel* under clause 5.20A.4 or clause 5.20A.5 (as applicable).

5.20A.4 Request for protected event declaration

- (a) AEMO must develop and submit to the *Reliability Panel* a request for declaration of a *non-credible contingency event* as a *protected event* in accordance with the recommendations of a *power system frequency risk review* and taking into account any guidelines issued by the *Reliability Panel* under clause 8.8.1(a)(2d) as to the timing and content of requests under this clause.
- (b) A request under this clause must include:
 - (1) information explaining the nature and likelihood of the *non-credible contingency event* and the consequences for the *power system* if the event were to occur including AEMO's estimate of *unserved energy*;

- (2) options for managing the *non-credible contingency event* as a *protected event*, AEMO's recommended option or range of options and the rationale for the recommendation;
- (3) for each recommended option under subparagraph (2), AEMO's estimate of the additional costs to operate the *power system* in accordance with the *power system* security principles in clause 4.2.6 if the event is declared to be a *protected event* including a description of the mechanisms that may be used;
- (4) where a recommended option for managing the *non-credible contingency event* includes a new or modified *emergency frequency control scheme*:
 - (i) the *target capabilities* proposed to be included in the *protected event EFCS standard* for the scheme, the rationale for the proposed *target capabilities* and the corresponding expected *power system security* outcomes including AEMO's estimate of *unserved energy* associated with operation of the scheme; and
 - (ii) AEMO's estimate of the costs to procure and commission the scheme and maintain its availability and performance, including upfront costs and ongoing maintenance costs;
- (5) AEMO's proposals for other matters that may be determined by the Reliability Panel under clause 8.8.4 in connection with the request; and
- (6) other information AEMO considers reasonably necessary to assist the *Reliability Panel* to consider the request.

5.20A.5 Request to revoke a protected event declaration

- (a) If AEMO recommends in a *power system frequency risk review* that a *non-credible contingency event* should no longer be managed as a *protected event*, AEMO must submit to the *Reliability Panel* a request to revoke the declaration of a *non-credible contingency event* as a *protected event* in accordance with the recommendations of the *power system frequency risk review*.
- (b) A request under this clause must include:
 - (1) information explaining the nature of the *non-credible contingency event* and the consequences for the *power system* if the event were to cease to be managed as a *protected event*; and

- (2) other information *AEMO* considers reasonably necessary to assist the *Reliability Panel* to consider the request.

[17] Clause S5.1a.3 System stability

In clause s5.1a.3(a), after "*credible contingency event*" insert "or *protected event*; and".

[18] Clause S5.1a.3 System stability

In clause S5.1a.3(c), after "*credible contingency event*" insert "or any *protected event*."

[19] Clause S5.1a.7 Voltage unbalance

In clause S5.1a.7, after "*credible contingency event*" insert "or *protected event*,".

[20] Table S5.1a.1

In Table S5.1a.1, column 3, after "credible contingency event" insert "or protected event".

[21] Clause S5.1.3 Frequency variations

Omit clause S5.1.3 and substitute:

A Network Service Provider must ensure that within the *extreme frequency excursion tolerance limits* all of its *power system* equipment will remain in service unless that equipment is required to be switched to give effect to manual *load shedding* in accordance with clause S5.1.10, or is required by *AEMO* to be switched for operational purposes or is required to be switched or *disconnected* for operation of an *emergency frequency control scheme*.

Sustained operation outside the *extreme frequency excursion tolerance limits* need not be taken into account by *Network Service Providers* in the design of *plant* which may be *disconnected* if this is necessary for the protection of that *plant*.

[22] Clause S5.1.4 Magnitude of power frequency voltage

In clause S5.1.4(b)(1) after "*credible contingency event*" insert "or *protected event*".

[23] Clause S5.1.4 Magnitude of power frequency voltage

In clause S5.1.4 omit the words "The agreement may include a different target range in the satisfactory operating state and after a credible contingency event (and how these target ranges may be required to vary with loading)." and substitute:

The agreement may include a different target range in the *satisfactory operating state* and after a *credible contingency event* or *protected event* (and how these target ranges may be required to vary with *loading*).

[24] Clause S5.1.8 Stability

In clause S5.1.8, after "*credible contingency event*" insert "or any *protected event*" wherever occurring.

[25] Clause S5.1.8 Stability

In clause S5.1.8 omit the second last paragraph and substitute:

In planning a *network* a *Network Service Provider* must consider *non-credible contingency events* such as *busbar* faults which result in tripping of several circuits, uncleared faults, double circuit faults and multiple contingencies which could potentially endanger the stability of the *power system*. In those cases where the consequences to any *network* or to any *Registered Participant* of such events are likely to be severe disruption a *Network Service Provider* and/or a *Registered Participant* must in consultation with *AEMO*, install, maintain and upgrade emergency controls within the *Network Service Provider's* or *Registered Participant's* system or in both, as necessary, to minimise disruption to any *transmission* or *distribution network* and to significantly reduce the probability of cascading failure.

[26] Clause 5.1.10 Load and network control facilities

Omit clause S5.1.10, including the heading, and substitute:

S5.1.10 Load, generation and network control facilities

S5.1.10.1 General

Each *Network Service Provider* in consultation with *AEMO* must ensure that:

- (a) sufficient *load* is under the control of underfrequency relays or other *facilities* where required to minimise or reduce the risk that in the event of the sudden, unplanned simultaneous occurrence of multiple *contingency events*, the *power system frequency* moves outside the *extreme frequency excursion tolerance limits*;
- (b) where determined to be necessary, sufficient *load* is under the control of undervoltage relays to minimize or reduce the risk of voltage collapse on the occurrence of multiple *contingency events*; and
- (c) there is sufficient *load* under manual control either locally or from remotely located *control centres* to allow the *load shedding*

procedures to be implemented on instruction from AEMO to enable AEMO to maintain power system security.

A Network Service Provider may require load shedding arrangements to be installed to cater for abnormal operating conditions including abnormal operating conditions in which emergency frequency control schemes are intended to operate.

Transmission Network Service Providers and connected Distribution Network Service Providers must cooperate to agree arrangements to implement load shedding. The arrangements may include the opening of circuits in either a transmission or distribution network.

The Transmission Network Service Provider must specify, in the connection agreement, control and monitoring requirements to be provided by a Distribution Network Service Provider for load shedding facilities including emergency frequency control schemes.

[27] New Clause S5.1.10.1a Emergency frequency control schemes

After clause S5.1.10.1, insert:

Clause S5.1.10.1a Emergency frequency control schemes

- (a) *A Network Service Provider must:*
- (1) *cooperate with AEMO in the conduct of power system frequency risk reviews and provide to AEMO all information and assistance reasonably requested by AEMO in connection with power system frequency risk reviews; and*
 - (2) *provide to AEMO all information and assistance reasonably requested by AEMO for the development and review of EFCS settings schedules.*
- (b) *Where a protected event EFCS standard has been determined for an emergency frequency control scheme applicable in respect of a Network Service Provider's transmission or distribution system, the Network Service Provider must:*
- (1) *design, procure, commission, maintain, monitor, test, modify and report to AEMO in respect of, the emergency frequency control scheme;*
 - (2) *perform its obligations under subparagraph (1) so as to achieve the availability and operation of the scheme in accordance with the protected event EFCS standard; and*
 - (3) *coordinate with AEMO in relation to the monitoring and testing of the scheme once it is in operation.*

- (c) A *Network Service Provider* must use reasonable endeavours to achieve commissioning of a new or upgraded *emergency frequency control scheme* within the time contemplated by the relevant *power system frequency risk review* or, where applicable, *AEMO's* request to the *Reliability Panel* for declaration of a *non-credible contingency event* as a *protected event* and the decision of the *Reliability Panel* with respect to that request.
- (d) For an *over frequency scheme*:
 - (1) a *Network Service Provider* must identify which elements of the scheme (if any) can be implemented by *facilities* provided by a *Generator* for the *Generator's generating unit* or by modification to the *facilities* of the *Generator* or by changes to the settings of *protection systems* or *control systems* for the *Generator's generating units*.
 - (2) Where those opportunities are identified, the *Network Service Provider* must notify the *Generator* concerned of the opportunity and must request the *Generator* to negotiate with the *Network Service Provider* to reach agreement on the modifications to be made and the other arrangements required by the *Network Service Provider* to comply with its obligations with respect to the scheme (including commissioning, testing, monitoring and future modification).
 - (3) If the *Generator* declines the request, or if the *Generator* agrees to the request but good faith negotiations do not result in agreement being reached in a reasonable time (having regard to the implementation timetable for the scheme), the *Network Service Provider* may make other arrangements to implement the relevant elements of the scheme.
 - (4) If the *Generator* accepts the request, the *Generator* and the *Network Service Provider* must each negotiate in good faith with respect to the matters referred to above.
- (e) Nothing in paragraph (d) is intended to prevent the exercise of rights under a connection agreement.
- (f) Nothing in paragraph (d) is intended to constitute or require an application to connect for the purposes of rule 5.3 or rule 5.3A. If clause 5.3.9 applies in respect of alterations for an *over frequency scheme* the subject of negotiations under paragraph (d), the *Network Service Provider* cannot charge a fee under clause 5.3.9(e) for assessment of a submission in respect of those alterations.

[28] Clause S5.1.10.2 Distribution Network Service Providers

Omit clauses S5.1.10.2(b) and (c) and substitute:

- (b) in accordance with the provisions of the relevant *connection agreement*, co-operate with the *Transmission Network Service Providers* in conducting periodic functional testing of the *facilities* and *emergency frequency control schemes*, which must not require *load* to be *disconnected*;
- (c) apply *frequency* settings to relays or other *facilities* as determined by *AEMO* in consultation with the *Network Service Provider*; and

[29] Clause S5.1.10.3 Transmission Network Service Providers

Omit clause S5.1.10.3(a), and substitute:

- (a) conduct periodic functional tests of the *load shedding facilities* and *emergency frequency control schemes*; and

[30] Clause S5.2.2 Application of Settings

In clause S5.2.2, omit the second paragraph and substitute:

If a *Generator* seeks approval from the *Network Service Provider* to apply or change a setting, then (except in the case of settings to be applied or changed by the *Generator* in connection with an *emergency frequency control scheme*) approval must not be withheld unless the *Network Service Provider* or, if the requirement is one that would involve *AEMO* under clause 5.3.4A(c) of the *Rules*, *AEMO*, reasonably determines that the changed setting would cause the *generating unit* to not comply with the relevant *performance standard* or cause an *inter-regional* or *intra-regional power transfer capability* to be reduced.

[31] Clause S5.2.5.8 Protection of generating systems from power system disturbances

Omit clause S5.2.5.8(e)(3) and substitute:

- (3) where the *generating system* is automatically *disconnected* under paragraph (a), clause S5.2.5.9 or by an *emergency frequency control scheme*;

[32] Clause S5.3.10 Load shedding facilities

In clause S5.3.10, omit the second paragraph and substitute:

Load shedding procedures may be applied by *AEMO*, or *EFCS settings schedules* may be determined, in accordance with the provisions of clause 4.3.2 of the *Rules* for the shedding of all *loads* including *sensitive loads*.

Schedule 4 Amendment to the National Electricity Rules

(Clause 6)

[1] Clause 8.8.1 Purpose of Reliability Panel

After clause 8.8.1(a)(2b), insert:

- (2c) on the advice of *AEMO*, determine which *non-credible contingency events* are to be *protected events* and any conditions applicable to the determination;
- (2d) if the *Reliability Panel* considers it necessary or desirable, determine guidelines for *power system frequency reviews* conducted by *AEMO* under clause 5.20A.1; requests for *protected event* declaration by *AEMO* under clause 5.20A.4; or the *Reliability Panel's* determination of *protected events* under clause 8.8.4;

[2] Clause 8.8.1 Purpose of Reliability Panel

In clause 8.8.1(a)(5), after "8.8.1(a)(1b), (2)" insert ", (2c)".

[3] Clause 8.8.1 Purpose of Reliability Panel

After clause 8.8.1(c), insert:

- (d) A request for declaration of a *protected event*, or revocation of a declaration, may only be made, and must be determined, in accordance with clause 8.8.4.

[4] Clause 8.8.3 Reliability Panel review process

In clause 8.8.3(aa), omit "system restart standard" and substitute "*system restart standard*".

[5] New Clause 8.8.4 Determination of protected events

After clause 8.8.3, insert:

8.8.4 Determination of protected events

- (a) A request for declaration of a *non-credible contingency event* as a *protected event* or for the revocation of such a declaration may only be submitted by *AEMO*. The request must be in accordance with clause 5.20A.4 or clause 5.20A.5 as applicable.
- (b) The *Reliability Panel* must comply with the *Rules consultation procedures* in relation to the determination of each request under paragraph (a).

- (c) In determining the request, the *Reliability Panel* must have regard to the information provided by *AEMO* in the request and may request further information or obtain such technical advice or assistance from time to time as it thinks appropriate including, without limitation, information, advice or assistance from *AEMO* and any *Registered Participant*.
- (d) In determining the request, the *Reliability Panel* may undertake its own assessment of the costs and benefits of managing the *non-credible* contingency event as a *protected event*, including:
 - (1) costs to operate the *power system* in a *secure operating state* if the event is declared;
 - (2) costs associated with any proposal for a new or modified *emergency frequency control scheme* or other *network investment* in connection with managing the event;
 - (3) the benefits of mitigating the consequences of the event occurring by managing it as a *protected event*.
- (e) In making a determination that declares a *non-credible contingency event* to be a *protected event* or revokes that declaration, the *Reliability Panel* must have regard to the *national electricity objective*.
- (f) When the *Reliability Panel* makes a determination under this clause, then subject to the provisions in the *Rules* applicable to *protected events*, the *Reliability Panel* may at the same time determine any other matters that the *Reliability Panel* considers necessary or appropriate in relation to the *protected event*, which may include:
 - (1) provision for the declaration of the *protected event* or the revocation of a declaration to come into effect at a future time, which may be a specified date or may be determined by reference to matters specified in the determination, such as the commissioning of a new or modified *emergency frequency control scheme* or the satisfaction of other conditions specified in the determination;
 - (2) matters relating to the availability and operation of an *emergency frequency control scheme*;
 - (3) matters relating to *AEMO's* operation of the *power system* for that *protected event*; and
 - (4) changes to the principles and guidelines published under clause 8.8.1(a)(2a) to apply in respect of the *protected event* for the purposes of clause 4.2.6(b).
- (g) When the *Reliability Panel* makes a determination under this clause that provides for the availability and operation of a new or modified

emergency frequency control scheme in connection with a *protected event*, the *Reliability Panel* must at the same time determine the *protected event EFCS standard* applicable to the scheme.

- (h) The final report of the *Reliability Panel* under the *Rules consultation procedures* must include:
 - (1) if the *Reliability Panel* has determined to make a declaration, the terms of the declaration, any conditions applicable to it and any other matters determined under paragraph (f) or (g);
 - (2) the rationale for the determination, including the costs and benefits that the *Reliability Panel* had regard to and the rationale for any *protected event EFCS standard* determined by the *Reliability Panel*; and
 - (3) where applicable, any other options considered and the corresponding expected *power system security* outcomes and costs and benefits.
- (i) The *Reliability Panel* must maintain and publish a list of all *protected events* (including events that will be *protected events* when the relevant declaration comes into effect) and each *protected event EFCS standard*.

Schedule 5 Amendment to the National Electricity Rules

(Clause 7)

[1] Chapter 10 New Definitions

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

EFCS settings schedule

The schedules developed by *AEMO* for each *participating jurisdiction* in accordance with clause 4.3.2(h)(2) specifying the settings for *emergency frequency control schemes* affecting *regions* in the *participating jurisdiction*.

emergency frequency control scheme

Facilities for initiating automatic *load shedding* or automatic *generation shedding* to prevent or arrest uncontrolled increases or decreases in *frequency* (alone or in combination) leading to *cascading outages* or *major supply disruptions*.

generation shedding

Disconnecting, or reducing the transfer of *active power* to the *power system* from, one or more *generating systems* or *generating units*.

over frequency scheme

An *emergency frequency control scheme* with capability to respond when *frequency* is above or climbing above the *normal operating frequency band*.

power system frequency risk review

A review described in clause 5.20A.1(c).

protected event

Has the meaning given in clause 4.2.3(f).

protected event EFCS standard

For an *emergency frequency control scheme* means the standard for the scheme determined by the *Reliability Panel* under clause 8.8.4 setting out:

- (a) a general description of the scheme including how it is proposed to operate and the new, existing or modified *facilities* likely to comprise the scheme; and
- (b) the *target capabilities* applicable to the scheme.

target capabilities

For an *emergency frequency control scheme* means the technical parameters required to define the intended (but not guaranteed) service provided by the scheme which may include:

- (a) *power system* conditions within which the scheme is capable of responding;
- (b) the nature of the scheme's response (*load shedding* or *generation shedding* for the purposes of managing *frequency*);
- (c) the speed of the response;
- (d) the amount of *load shedding* or *generation shedding* that may occur when the scheme responds; and
- (e) capability to dynamically sense *power system* conditions.

under frequency scheme

An *emergency frequency control scheme* with capability to respond when *power system frequency* is below or falling below the *normal operating frequency band*.

[2] Chapter 10 Substituted Definitions

In Chapter 10, substitute the following definitions:

load shedding

Reducing or *disconnecting load* from the *power system*.

load shedding procedures

The procedures developed by *AEMO* for each *participating jurisdiction* in accordance with clause 4.3.2(h)(1) for the implementation of the *load shedding* priority and *sensitive load* priority advised by that *Jurisdictional System Security Coordinator* under clauses 4.3.2(f)(1) and (2).

Schedule 6 Savings and Transitional Amendments to the National Electricity Rules

(Clause 8)

[1] Chapter 11 New Part ZZY

After rule 11.96 insert:

Part ZZY Emergency Frequency Control Schemes

11.97 Rules consequent on the making of the National Electricity Amendment (Emergency frequency control schemes) Rule 2017

11.97.1 Definitions

For the purposes of this rule 11.97:

Amending Rule means the National Electricity Amendment (Emergency frequency control schemes) Rule 2017.

Commencement Date means 6 April 2017.

Interim frequency operating standards for protected events means the *frequency operating standards for protected events* as set out in clause 11.97.2(b).

new clause 4.3.2(h)(1) means clause 4.3.2(h)(1) of the *Rules* as in force on and from the Commencement Date.

new clause 4.3.2(h)(2) means clause 4.3.2(h)(2) of the *Rules* as in force on and from the Commencement Date.

old clause 4.3.2(h) means clause 4.3.2(h) of the *Rules* as in force immediately before the Commencement Date.

11.97.2 Interim frequency operating standards for protected events

(a) On and from the Commencement Date, until the such time as the *Reliability Panel* determines the *NEM frequency operating standards for protected events* in the *power system security standards* under cl 8.8.1(a)(2), the *frequency operating standards for protected events* are taken to be the interim frequency operating standards for protected events in paragraph (b).

(b) The interim frequency operating standards for protected events are:

Tasmania

For a *protected event*, system *frequency* should not exceed the applicable *extreme frequency excursion tolerance limits* and should not exceed the applicable load change band for more than two minutes while there is no

contingency event or the applicable *normal operating frequency band* for more than 10 minutes while there is no *contingency event* as summarised in the table below:

CONDITION	CONTAINMENT	STABILISATION	RECOVERY
protected event	47.0 to 55.0 Hz	48.0 to 52.0 Hz within 2 minutes	49.0 to 51.0 Hz within 10 minutes

This standard applies for both an *interconnected* and an *islanded* system.

NEM Mainland

For a *protected event*, system *frequency* should not exceed the applicable *extreme frequency excursion tolerance limits* and should not exceed the applicable load change band for more than two minutes while there is no *contingency event* or the applicable *normal operating frequency band* for more than 10 minutes while there is no *contingency event* as summarised in the tables below:

NEM Mainland Frequency Operating Standards – interconnected system

CONDITION	CONTAINMENT	STABILISATION	RECOVERY
protected event	47.0 to 52.0 Hz	49.5 to 50.5Hz within 2 minutes	49.85 to 50.15 Hz within 10 minutes

NEM Mainland Frequency Operating Standards – for an islanded system

CONDITION	CONTAINMENT	STABILISATION	RECOVERY
protected event	47.0 to 52.0 Hz	49.0 to 51.0 Hz within 2 minutes	49.5 to 50.5 Hz within 10 minutes

NEM Mainland Frequency Operating Standards – during periods of supply scarcity

CONDITION	CONTAINMENT	STABILISATION	RECOVERY
protected event	47.0 to 52.0 Hz	49.0 to 51.0 Hz within 2 minutes	49.5 to 50.5 Hz within 10 minutes

11.97.3 First power system frequency risk review

Despite clause 5.20A.2(a), *AEMO* must complete the first *power system frequency risk review* within 12 months of the Commencement Date.

11.97.4 AEMO must review existing load shedding procedures

As soon as reasonably practicable after the Commencement Date, *AEMO* must review, and if necessary amend, the *load shedding procedures* developed under old clause 4.3.2(h) to take into account the Amending Rule.

11.97.5 Load shedding procedures

On and from the Commencement Date any *load shedding procedures* developed by *AEMO* under old clause 4.3.2(h) will be taken to be:

- (a) *load shedding procedures* for the purposes of new clause 4.3.2(h)(1) if they are procedures under which *load* will be shed by means other than an *emergency frequency control scheme*; or
- (b) *EFCS settings schedules* for the purposes of new clause 4.3.2(h)(2) if they specify, for an *emergency frequency control scheme*, settings for operation of the scheme.

[END OF RULE AS MADE]
