AEMC

National Electricity Amendment (Efficient reactive current access standards for inverter-based resources) Rule 2023 No. 1

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 of the Northern Territory; 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.

Anna Collyer
Chairperson
Australian Energy Market Commission

National Electricity Amendment (Efficient reactive current access standards for inverter-based resources) Rule 2023 No. 1

1 Title of Rule

This Rule is the *National Electricity Amendment (Efficient reactive current access standards for inverter-based resources) Rule 2023 No. 1*.

2 Commencement

Schedule 1 of this Rule commences operation on 27 April 2023.

Schedule 2 of this Rule commences operation on 3 June 2024, immediately after the commencement of Schedules 1 to 6 of the *National Electricity Amendment (Integrating energy storage systems into the NEM) Rule 2021 No. 13*.

Schedule 3 of this Rule commences operation on 27 April 2023.

3 Amendment to the National Electricity Rules

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

4 Amendment to the National Electricity Rules

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

5 Savings and Transitional Amendment to the National Electricity Rules

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

Schedule 1   Amendment to the National Electricity Rules

(Clause 3)

[1] S5.2.5.5   Generating system response to disturbances following contingency events

In clause S5.2.5.5(e)(1), omit "maximum continuous current" and substitute "*maximum continuous current*".

[2] S5.2.5.5   Generating system response to disturbances following contingency events

In clause S5.2.5.5(f)(1), omit all references to "maximum continuous current" and substitute "*maximum continuous current*".

[3] S5.2.5.5   Generating system response to disturbances following contingency events

In clause S5.2.5.5(i)(2), omit "maximum continuous current" and substitute "*maximum continuous current*".

[4] S5.2.5.5   Generating system response to disturbances following contingency events

Omit clause S5.2.5.5(n)(1)(i) and substitute:

> (i)   capacitive reactive current in addition to its pre-disturbance level of a percentage greater than 0% of the *maximum continuous current* of the *generating system* including all operating *asynchronous generating units* (in the absence of a disturbance) for each 1% reduction of *voltage* at the *connection point* below the relevant point at which a reactive current response must commence, as identified in or agreed under paragraph (o)(1); and

[5] S5.2.5.5   Generating system response to disturbances following contingency events

Omit clause S5.2.5.5(n)(1)(ii) and substitute:

> (ii)   inductive reactive current in addition to its pre-disturbance level of a percentage greater than 0% of the *maximum*

continuous current of the *generating system* including all operating *asynchronous generating units* (in the absence of a disturbance) for each 1% increase of *voltage* at the *connection point* above the relevant point at which a reactive current response must commence, as identified in or agreed under paragraph (o)(1),

[6]   S5.2.5.5   Generating system response to disturbances following contingency events

Omit clause S5.2.5.5(n)(2) and substitute:

>   (2)   return to at least 95% of:
>
>   (i)   the pre-fault *active power* output; or
>
>   (ii)   during a frequency disturbance, a level of *active power* output consistent with the *generating system's performance standard* under clause S5.2.5.11,
>
>   after clearance of the fault and recovery of positive sequence *voltage* at the *connection point* to remain between 90% and 110% of *normal voltage*, within a period agreed by the *Connection Applicant*, *AEMO* and the *Network Service Provider*, which period may differ according to the type of fault.

[7]   S5.2.5.5   Generating system response to disturbances following contingency events

Omit clause S5.2.5.5(o) and substitute:

>   (o)   For the purpose of paragraph (n):
>
>   (1)   the *generating system* must commence a response when the *voltage*:
>
>   (i)   falls to a threshold of 80% of *normal voltage* or other percentage threshold agreed with *AEMO* and the *Network Service Provider*; or
>
>   (ii)   increases to a threshold of 120% of *normal voltage* or other percentage threshold agreed with *AEMO* and the *Network Service Provider*,
>
>   and in each case may commence a response before the threshold is reached;
>
>   (2)   **[Deleted]**;

(2A) the response initiating conditions must be agreed with *AEMO* and the *Network Service Provider*;

(3) the reactive current *rise time* must be no longer than 80 milliseconds or a longer time agreed to by the *Network Service Provider* and *AEMO*;

(4) the reactive current response must be adequately controlled;

(5) the reactive current response must commence within a period after the response initiating condition of:

    (i) 40 milliseconds; or

    (ii) a longer time agreed to by the *Network Service Provider* and *AEMO*; and

(6) the time when the reactive current response commences may be measured at either:

    (i) the *connection point*; or

    (ii) if agreed by the *Network Service Provider* and *AEMO*, the *generating unit* terminals or a point between the *generating unit* terminals and the *connection point*.

[8] S5.2.5.5   Generating system response to disturbances following contingency events

After clause S5.2.5.5(o), insert a new clause S5.2.5.5(o1) as follows:

(o1) For the purposes of paragraphs (n) and (o), the *performance standards* must record:

(1) the range applicable for subparagraph (n)(1);

(2) the period agreed for subparagraph (n)(2), where applicable for each type of fault;

(3) for subparagraph (o)(1), the percentage thresholds;

(4) for subparagraph (o)(2A), the response initiating condition;

(5) for subparagraph (o)(3), the reactive current *rise time*;

(6) for subparagraph (o)(5), the required response time; and

(7) for subparagraph (o)(6), where the time of commencement is to be measured.

[9] S5.2.5.5   Generating system response to disturbances following contingency events

After clause S5.2.5.5(p), insert the new heading "**Provision of minimum access standard**".

[10] S5.2.5.5   Generating system response to disturbances following contingency events

After clause S5.2.5.5(p), after the heading "**Provision of minimum access standard**", insert the following new clauses:

(p1) For the purposes of providing *minimum access standards* under clauses 5.3.3(b1)(4) and S5.4B(b)(2) in respect of reactive current response, and for the purposes of clause 5.3.4A(b), a *Network Service Provider* may provide the times in paragraphs (o)(3) and (o)(5)(i) or other longer times it may be prepared to agree.

(p2) For the purposes of clause 5.3.4A, and subject to clauses 5.3.4A(b1) and 5.3.4A(b2), when proposing a *negotiated access standard* in respect of reactive current response, the *Connection Applicant* may propose the times in paragraphs (o)(3) and (o)(5)(i) or other longer times it is seeking to agree.

(p3) A *negotiated access standard* with a lower standard or longer time agreed to by the *Network Service Provider* and *AEMO* in accordance with paragraph (o) is taken to satisfy the requirements of clause 5.3.4A(b)(1) for a *negotiated access standard* to be no less onerous than the corresponding *minimum access standard* provided by the *Network Service Provider* under clauses 5.3.3(b1)(4) or S5.4B(b)(2).

[11] S5.2.5.5   Generating system response to disturbances following contingency events

In clause S5.2.5.5(u)(1), omit "maximum continuous current" and substitute "*maximum continuous current*".

[12] S5.2.5.5   Generating system response to disturbances following contingency events

After clause S5.2.5.5(u)(1), insert a new clause S5.2.5.5(u)(1A) as follows:

(1A) the reactive current contribution must not contribute excessively to *voltage* rise on unfaulted phases during unbalanced faults;

[13] S5.2.5.5   Generating system response to disturbances following contingency events

Omit clause S5.2.5.5(u)(4) and substitute:

> (4)   the *performance standards* must record:
>
> > (i)   all conditions (which may include temperature) considered relevant by *AEMO* and the *Network Service Provider* under which the reactive current response is required; and
> >
> > (ii)   the maximum reactive current contribution to each phase.

[14] S5.2.5.5   Generating system response to disturbances following contingency events

In clause S5.2.5.5(v), omit "maximum continuous current" and substitute "*maximum continuous current*".

[15] S5.2.5.5   Generating system response to disturbances following contingency events

In clause S5.2.5.5(w), omit "maximum continuous current" and substitute "*maximum continuous current*".

[16] Chapter 10   Glossary

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

maximum continuous current

> In respect of a *generating system*:
>
> (a) where assessed at the *connection point*, the current at the *connection point* corresponding to the largest amount of *apparent* power required by the *generating system's performance standard* under S5.2.5.1, at the *normal voltage*; and
>
> (b) where assessed at any other point, the current at that point assessed in the manner agreed by the *Network Service Provider* for the *transmission system* or *distribution system* to which the *generating system* is *connected* and recorded in the *connection agreement*.

Schedule 2   Amendment to the National Electricity Rules

(Clause 4)

[1] S5.2.5.5   Response to disturbances following contingency events

In clause S5.2.5.5(n)(2)(ii), after "*generating system's*" insert "or *integrated resource system's*".

[2] S5.2.5.5   Response to disturbances following contingency events

Omit clause S5.2.5.5(o)(2) and substitute "**[Deleted]**".

[3] S5.2.5.5   Response to disturbances following contingency events

Omit clause S5.2.5.5(o)(3) and substitute:

> (3)   the reactive current *rise time* must be no longer than 80 milliseconds or a longer time agreed to by the *Network Service Provider* and *AEMO*;

[4] S5.2.5.5   Response to disturbances following contingency events

In clause S5.2.5.5(o)(6), omit all references to "*generating unit* terminals" and substitute "*production unit* terminals".

[5] S5.2.5.5   Response to disturbances following contingency events

In clause S5.2.5.5(v), omit "maximum continuous current" and substitute "*maximum continuous current*".

[6] S5.2.5.5   Response to disturbances following contingency events

In clause S5.2.5.5(w), omit "maximum continuous current" and substitute "*maximum continuous current*".

[7] Chapter 10   Amended definitions

In Chapter 10, in the definition of "**maximum continuous current**", after each occurrence of "*generating system*" insert "or *integrated resource system*".

[8] Chapter 10   Amended definitions

In Chapter 10, in the definition of "**maximum continuous current**", after "*generating system's*" insert "or *integrated resource system's*".

Schedule 3   Savings and Transitional Amendment to the National Electricity Rules

<div align="right">(Clause 5)</div>

[1]   New Part ZZZZZI Efficient reactive current access standards for inverter-based resources

In Chapter 11, after Part ZZZZZI, insert a new Part:

Part ZZZZZI   Efficient reactive current access standards for inverter-based resources

11.159   Rules consequential on the making of the National Electricity Amendment (Efficient reactive current access standards for inverter-based resources) 2023

11.159.1 Definitions

(a)   In this rule 11.159:

Amending Rule means the *National Electricity Amendment (Efficient reactive current access standards for inverter-based resources) Rule 2023*.

effective date means the date of commencement of Schedule 1 of the Amending Rule.

existing application to connect has the meaning given in clause 11.159.4(a)(1).

existing connection agreement means a *connection agreement* entered into before the effective date.

existing connection enquiry has the meaning given in clause 11.159.3(a)(1).

IESS rule means the *National Electricity Amendment (Integrating energy storage systems into the NEM) Rule 2021 No. 13*.

initial implementation period means the period of three months starting on the effective date.

new clause S5.2.5.5 means clause S5.2.5.5 of new Chapter 5.

new Chapter 5 means Chapter 5 as in force on and from the effective date.

new Chapter 10 means Chapter 10 as in force on and from the effective date.

old Chapter 5 means Chapter 5 as in force immediately prior to the effective date.

(b)   Italicised terms used in this rule 11.159 have the same meaning as in new Chapter 10.

11.159.2   Interaction with the IESS rule

(a)   On and from the effective date, a reference in rule 11.145.13 to Schedule 5.2 of the new rules means Schedule 5.2 of the new rules (as defined in rule 11.145.1) as amended by the Amending Rule.

11.159.3   Application of the Amending Rule to existing connection enquiries

(a)   This clause applies where, before the effective date, a *Connection Applicant* has, in respect of *plant* that the *Connection Applicant* proposes to *connect*:

   (1)   made a *connection* enquiry in accordance with clauses 5.3.2 or 5.3A.5 (**existing connection enquiry**); and

   (2)   not made an *application to connect* to a *Network Service Provider*.

(b)   On and from the effective date:

   (1)   new clause S5.2.5.5 applies for the purposes of determining the *access standards* that apply to the *plant* that the *Connection Applicant* proposes to *connect*;

   (2)   the existing connection enquiry will be taken to be a *connection* enquiry under the new Chapter 5 with respect to the proposed *plant*; and

   (3)   the *Network Service Provider* must:

      (i)   within 10 *business days* after the effective date, use its reasonable endeavours to provide written notification to a *Connection Applicant* to which this clause applies that the existing connection enquiry will be treated as a *connection* enquiry under new Chapter 5; and

      (ii)   within 20 *business days* after providing the written notification in subparagraph (3)(i), in consultation with *AEMO* and where necessary, provide each *Connection Applicant* notified under subparagraph (3)(i) with:

         (A)   any further information required under clause 5.3.3 of new Chapter 5 relevant to the proposed *plant*; and

   (B) written notice of any further information or data to be provided by the *Connection Applicant* to the *Network Service Provider*,

  to enable the *Connection Applicant* to submit an *application to connect* in accordance with new Chapter 5 with respect to the proposed *plant*.

(c) Where the *Network Service Provider* has charged the *Connection Applicant* any fees or charges with respect to the existing connection enquiry, the *Network Service Provider* must not charge the *Connection Applicant* any additional fees or charges on or from the effective date with respect to such existing connection enquiry, except to the extent necessary to cover the reasonable costs of work required to notify the *Connection Applicant* and provide any relevant information under subparagraph (b)(3)(ii). For the avoidance of doubt, this clause does not preclude a *Network Service Provider* recovering an application fee from the *Connection Applicant* under clauses 5.3.4(b) or 5.3A.9.

11.159.4 Application of the Amending Rule to existing applications to connect

(a) This clause applies where, before the effective date, a *Connection Applicant* has, in respect of *plant* that the *Connection Applicant* proposes to *connect*:

(1) made an *application to connect* to a *Network Service Provider* (**existing application to connect**); and

(2) not received an offer to *connect* from the relevant *Network Service Provider* in respect of the existing application to connect.

(b) On and from the effective date:

(1) new clause S5.2.5.5 applies for the purposes of determining the *access standards* that apply to the *plant* that the *Connection Applicant* proposes to *connect*;

(2) the existing application to connect will be taken to be an *application to connect* under new Chapter 5 with respect to the proposed *plant*; and

(3) the *Network Service Provider* must:

  (i) within 10 *business days* after the effective date, use its reasonable endeavours to provide written notification to a *Connection Applicant* to which this clause applies that the existing application to connect will be treated as an *application to connect* under new Chapter 5; and

(ii) within 20 *business days* after providing the written notification in subparagraph (3)(i), in consultation with *AEMO* and where necessary, provide each *Connection Applicant* notified under subparagraph (3)(i) (with a copy to be provided to *AEMO*) with:

(A) any further information required under clause 5.3.3 or clause 5.3A.5 of new Chapter 5 relevant to the proposed *plant*, including for each technical requirement, written details of the *automatic access standards*, *minimum access standards* and *negotiated access standards* that are *AEMO advisory matters*; and

(B) written notice of any further information to be provided by the *Connection Applicant* (which may include information required to be provided under clauses 5.2.5(d) and (e), clauses 5.2.5A(d) and (e) and Schedule 5.5),

necessary for the *Network Service Provider* to prepare an offer to *connect* in accordance with new Chapter 5 with respect to the proposed *plant*.

(c) Where the *Network Service Provider* has charged the *Connection Applicant* any fees or charges with respect to the existing application to connect, the *Network Service Provider* must not charge the *Connection Applicant* any additional fees or charges on or from the effective date with respect to such existing application to connect, except to the extent necessary to cover the reasonable costs of work required for the *Network Service Provider* to prepare an offer to *connect* in accordance with new Chapter 5, including the requirements to notify the *Connection Applicant* and provide any relevant information under subparagraph (b)(3).

(d) A *Network Service Provider* to which this clause applies may extend the period referred to in clause 5.3.6(a) to reasonably allow for any additional time taken in excess of the period allowed in the *preliminary program* that is necessary to take account of the differences in *access standards* between old Chapter 5 and new Chapter 5.

11.159.5 Application of the Amending Rule to existing offers to connect

(a) This clause applies where, before the effective date, a *Connection Applicant*, other than a *Connection Applicant* to whom clause 11.159.4 applies, in respect of *plant* that the *Connection Applicant* proposes to connect:

(1) has received an offer to *connect* from the relevant *Network Service Provider* in respect of an *application to connect*; and

(2)   has not entered into a *connection agreement* with the relevant *Network Service Provider* in respect of that *application to connect*.

(b)   Subject to paragraph (c), on and from the effective date, old Chapter 5 applies for the purposes of determining the *access standards* that apply to any *plant* that the *Connection Applicant* proposes to *connect* under that offer to *connect*.

(c)   A *Network Service Provider*, *AEMO* and a *Connection Applicant* may agree to apply new clause S5.2.5.5 for the purposes of determining the *access standards* that apply to the *plant* that the *Connection Applicant* proposes to *connect* under that offer to *connect*.

11.159.6   Extension of time frames

(a)   For each clause listed in paragraph (b), where:

(1)   the clause specifies, or provides a means to determine, a maximum number of *business days* for a *Network Service Provider* or *AEMO* to perform an obligation in relation to a *connection* enquiry or an *application to connect* that (in either case) was submitted before or during the initial implementation period; and

(2)   the first of those *business days* falls in the initial implementation period,

the maximum number of *business days* by which the obligation must be performed is extended by 30 *business days* in respect of that *connection* enquiry or *application to connect*.

(b)   The clauses referred to in paragraph (a) are:

(1)   clause 5.3.3(b);

(2)   clause 5.3.3(b1);

(3)   clause 5.3.3(c);

(4)   clauses 5.3.4A(d) and (e);

(5)   clause 5.3.6(a)(1);

(6)   clause 5.3A.5(g);

(7)   clause 5.3A.7(a); and

(8)   clause 5.3A.8(c).

11.159.7   Application of the Amending Rule to existing connection agreements

(a)   None of the provisions in the Amending Rule are intended to have, nor should they be read or construed as having, the effect of:

(1)   altering the terms of an existing connection agreement;

(2)   altering the contractual rights or obligations of any of the parties under an existing connection agreement including the nature of, or standards of performance applicable to, any service provided under the agreement; or

(3)   relieving the parties under any such existing connection agreement of their contractual obligations under such an agreement.

(b)   If, after the effective date, a *Registered Participant* who has entered into an existing connection agreement is required, in accordance with the *Rules*, to amend any of the *performance standards* set out in that existing connection agreement, new clause S5.2.5.5 applies for the purposes of amending such *performance standards*.

[END OF RULE AS MADE]