



## **Draft National Electricity Amendment (Generating System Model Guidelines) 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 (Generating System Model Guidelines) Rule 2017**

### **1 Title of Rule**

This Rule is the *Draft National Electricity Amendment (Generating System Model Guidelines) Rule 2017*.

### **2 Commencement**

Schedules 1, 2, 3 and 4 commence operation on the date that is one year after the rule is made.

Schedule 5 commences operation on the date the rule is made.

### **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 3.11.5      Tender process for network support and control ancillary services**

Omit clause 3.11.5(b)(5) and substitute:

- (5) a requirement for a tenderer to provide sufficient data, models and parameters for relevant *plant* in accordance with the requirements specified in the *Power System Model Guidelines*, the *Power System Design Data Sheet* and the *Power System Setting Data Sheet*, to facilitate a thorough assessment of the *network* impacts and *power station* impacts of the use of the relevant *network support and control ancillary service*;

### **[2] Clause 3.11.9      Acquisition of system restart ancillary services by AEMO**

Omit clause 3.11.9(g) and substitute:

- (g) A prospective *SRAS Provider* must provide to *AEMO* sufficient data, models and parameters of relevant *plant* in accordance with the requirements specified in the *Power System Model Guidelines*, the *Power System Design Data Sheet* and the *Power System Setting Data Sheet*, to facilitate a thorough assessment of the *network* impacts and *power station* impacts of the use of the relevant *system restart ancillary service*.

### **[3] Clause 3.13.3      Standing data**

After clause 3.13.3(k), insert:

- (k1) *AEMO* must set out in the *Power System Model Guidelines* the circumstances in which *AEMO* will consider the information under clause 3.13.3(k)(2) to be reasonably required by a *Registered Participant*.

## Schedule 2      Amendment to the National Electricity Rules

(Clause 4)

### [1] Clause 4.3.4      Network Service Providers

After clause 4.3.4(i), insert:

- (j) If in *AEMO*'s reasonable opinion, there is a risk that an alteration to a *network element* will adversely affect *network capability*, *power system security*, quality or reliability of *supply*, *inter-regional power transfer capability* or the use of a *network* by a *Network User*, *AEMO* may request, and following such request, the relevant *Network Service Provider* must provide to *AEMO*, the following kinds of information:
- (1) a set of functional block diagrams, including all functions between feedback signals and output;
  - (2) the parameters of each functional block, including all settings, gains, time constants, delays, deadbands and limits;
  - (3) the characteristics of non-linear elements;
  - (4) encrypted models in a form suitable for the software simulation products nominated by *AEMO* in the *Power System Model Guidelines*;
  - (5) where available, model source code associated with the model in subparagraph (4) in an unencrypted form suitable for at least one of the software simulation products nominated by *AEMO* in the *Power System Model Guidelines*, and in a form that would allow conversion for use with other software simulation products by *AEMO* as nominated in the *Power System Model Guidelines*; and
  - (6) any other information specified in the *Power System Model Guidelines*, *Power System Design Data Sheet* and *Power System Setting Data Sheet*,

with sufficient detail for *AEMO* to perform *power system* simulation studies in accordance with the requirements and circumstances specified in the *Power System Model Guidelines*.

## **Schedule 3            Amendment to the National Electricity Rules**

(Clause 5)

### **[1] Clause 5.2.5            Obligations of Generators**

In clause 5.2.5(b)(5), omit “and” at the end of the clause.

### **[2] Clause 5.2.5            Obligations of Generators**

In clause 5.2.5(b)(6), omit “.” at the end of the clause and substitute “; and”.

### **[3] Clause 5.2.5            Obligations of Generators**

After clause 5.2.5(b)(6), insert:

- (7) if requested by *AEMO*, provide to *AEMO* and the relevant *Network Service Provider*, information of the type described in clause 5.2.4 in accordance with the requirements and circumstances specified in the *Power System Model Guidelines*, the *Power System Design Data Sheet* and the *Power System Setting Data Sheet*.

### **[4] Clause 5.2.5            Obligations of Generators**

After clause 5.2.5(b), insert:

- (c) All information provided to *AEMO* or the relevant *Network Service Provider* under clause 5.2.5(b)(7) must be treated as *confidential information* by those recipients.

### **[5] Clause 5.3.9            Procedure to be followed by a Generator proposing to alter a generating system**

In clause 5.3.9(a), omit “.” at the end of the clause and substitute “or in the circumstances specified in the *Power System Model Guidelines* where, in *AEMO*’s reasonable opinion, there is a risk that the alteration will adversely affect *network capability, power system security, quality or reliability of supply, inter-regional power transfer capability* or the use of a *network* by another *Network User*.”

### **[6] Clause 5.3.9            Procedure to be followed by a Generator proposing to alter a generating system**

Omit clause 5.3.9(b)(2), and substitute:

- (2) in respect of the proposed alteration to the *generating system*, details of the *generating unit* design data and *generating unit* setting data in accordance with the *Power System Model Guidelines*, *Power System Design Data Sheet* and *Power System Setting Data Sheet*; and

**[7] Clause 5.7.6 Tests of generating units requiring changes to normal operation**

In clause 5.7.6(b)(2), omit “*Generating System Model Guidelines*” and substitute “*Power System Model Guidelines*”.

**[8] Clause 5.7.6 Tests of generating units requiring changes to normal operation**

In clause 5.7.6(h), omit “*Generating System Model Guidelines*” and substitute “*Power System Model Guidelines*”.

**[9] Schedule 5.2.4 Provision of information**

In clause S5.2.4(b)(5)(ii), omit “and”.

**[10] Schedule 5.2.4 Provision of information**

In clause S5.2.4(b)(5)(iii), omit “,” and substitute “; and”.

**[11] Schedule 5.2.4 Provision of information**

After clause S5.2.4(b)(5)(iii), insert:

- (iv) encrypted models in a form suitable for the software simulation products nominated by *AEMO* in the *Power System Model Guidelines*; and
- (v) any other information specified in the *Power System Model Guidelines*, *Power System Design Data Sheet* and *Power System Setting Data Sheet*,

**[12] schedule 5.2.4 Provision of information**

In clause S5.2.4(b)(5), omit “load flow and dynamic simulation studies” and substitute “*power system* simulation studies”.

**[13] Schedule 5.2.4 Provision of information**

Omit clause S5.2.4(b)(6), and substitute:

- (6) to *AEMO*, where available, the model source code associated with the *power system* simulation model in subparagraph (5) in an unencrypted form suitable for at least one of the software simulation products nominated by *AEMO* in the *Power System Model Guidelines*, and in a form that would allow conversion for use with other software products by *AEMO* as nominated in the *Power System Model Guidelines*;

**[14] Schedule 5.2.4 Provision of information**

In clause S5.2.4(c)(2), omit “*Generating System Model Guidelines*” and substitute “*Power System Model Guidelines*”.

### **[15] Schedule 5.2.4 Provision of information**

In clause S5.2.4(c)(2), omit “.” at the end of the clause and substitute “and (where applicable) specialised *power system* studies.”.

### **[16] Schedule 5.3.1 Information**

After clause S5.3.1(a) insert:

- (a1) Before a *Network User connects* any new or additional equipment to a *network* that is intended to consume or use in excess of 20,000 MWh per annum, the *Network User* must submit the following kinds of information to *AEMO* about the *control systems* of the equipment:
- (1) a set of functional block diagrams, including all functions between feedback signals and output;
  - (2) the parameters of each functional block, including all settings, gains, time constants, delays, deadbands and limits;
  - (3) the characteristics of non-linear elements;
  - (4) encrypted models in a form suitable for the software simulation products nominated by *AEMO* in the *Power System Model Guidelines*;
  - (5) where available, model source code associated with the model in subparagraph (4) in an unencrypted form suitable for at least one of the software simulation products nominated by *AEMO* in the *Power System Model Guidelines* and in a form that would allow conversion for use with other software simulation products by *AEMO* as nominated in the *Power System Model Guidelines*; and
  - (6) any other information specified in the *Power System Model Guidelines*, *Power System Design Data Sheet* and *Power System Setting Data Sheet*,

with sufficient detail for *AEMO* to perform power system simulation studies in accordance with the requirements and circumstances specified in the *Power System Model Guidelines*.

### **[17] Clause S5.5.2 Categories of data**

In clause S5.5.2, omit “*Generating System Model Guidelines*” and substitute “*Power System Model Guidelines*”.

**[18] Clause S5.5.2 Categories of data**

In clause S5.5.2, omit “*Generating System Design Data Sheet*” and substitute “*Power System Design Data Sheet*”.

**[19] Clause S5.5.2 Categories of data**

In clause S5.5.2, omit “*Generating System Setting Data Sheet*” and substitute “*Power System Setting Data Sheet*”.

**[20] Clause S5.5.4 Data requirements**

In clause S5.5.4, omit “*Generating System Model Guidelines*” and substitute “*Power System Model Guidelines*”.

**[21] Clause S5.5.4 Data requirements**

In clause S5.5.4, omit “*Generating System Design Data Sheet*” and substitute “*Power System Design Data Sheet*”.

**[22] Clause S5.5.4 Data requirements**

In clause S5.5.4, omit “*Generating System Setting Data Sheet*” and substitute “*Power System Setting Data Sheet*”.

**[23] Clause S5.5.5 Asynchronous generating unit data**

In clause S5.5.5, omit “*Generating System Model Guidelines*” and substitute “*Power System Model Guidelines*”.

**[24] Clause S5.5.5 Asynchronous generating unit data**

In clause S5.5.5, omit “*Generating System Design Data Sheet*” and substitute “*Power System Design Data Sheet*”.

**[25] Clause S5.5.5 Asynchronous generating unit data**

In clause S5.5.5, omit “*Generating System Design Data Sheet*” and substitute “*Power System Design Data Sheet*”.

**[26] Clause S5.5.6 Generating units equal to or smaller than 30MW data**

Omit clause S5.5.6 in its entirety, including the heading, and substitute:

**S5.5.6 Generating units smaller than 30MW data**

*A Generator that connects a generating unit smaller than 30 MW or generating units totalling less than 30 MW to a connection point to a distribution network must submit registered system planning data and registered data to AEMO and the relevant Network Service Provider in*

accordance with the requirements specified in the *Power System Model Guidelines*, *Power System Design Data Sheet* and *Power System Setting Data Sheet*.

Codes:

S = Standard Planning Data

D = Detailed Planning Data

R = Registered Data (R1 pre-connection, R2 post-connection)

## **[27] Clause S5.5.7      Generating System Design Data Sheet, Generating System Setting Data Sheet and Generating System Model Guidelines**

Omit clause S5.5.7 in its entirety, including the heading, and substitute:

### **S5.5.7      Power System Design Data Sheet, Power System Setting Data Sheet and Power System Model Guidelines**

- (a) *AEMO* must, subject to paragraphs (b) and (c), develop, *publish* and maintain, in accordance with the *Rules consultation procedures*:
- (1) a *Power System Design Data Sheet* describing, for relevant *plant technologies*, *plant* design parameters including *plant* configurations, impedances, time constants, non-linearities, ratings and capabilities to be provided under clauses 3.11.5(b)(5), 3.11.9(g), 4.3.4(j), 5.2.5(b)(7), 5.3.9(b)(2), S5.2.4, S5.3.1 and this schedule 5.5;
  - (2) a *Power System Setting Data Sheet* describing, for relevant *power systems* and *control system* technologies, the *power system protection system* and *control system* functions and their settings, including configurations, gains, time constants, delays, deadbands, non-linearities and limits to be provided under clauses 3.11.5(b)(5), 3.11.9(g), 4.3.4(j), 5.2.5(b)(7), 5.3.9(b)(2), S5.2.4, S5.3.1 and this schedule 5.5; and
  - (3) *Power System Model Guidelines* describing, for relevant *power system* technologies at the *transmission system* and *distribution system* level, *AEMO's* requirements when developing mathematical models for *plant*, including the impact of their *control systems* and *protection systems* on *power system security* to be provided under clauses 3.11.5(b)(5), 3.11.9(g), 4.3.4(j), 5.2.5(b)(7), 5.3.9(b)(2), S5.2.4, S5.3.1 and this schedule 5.5.
- (b) When developing, *publishing* and maintaining the *Power System Model Guidelines*, the *Power System Design Data Sheet* and the *Power System Setting Data Sheet* under paragraph (a), *AEMO* must

have regard to the purpose of the *Power System Model Guidelines*, the *Power System Design Data Sheet* and the *Power System Setting Data Sheet*, which is to:

- (1) allow *plant* to be mathematically modelled by *AEMO* with sufficient accuracy to permit:
    - (i) the *power system* operating limits for ensuring *power system security* to be quantified with the lowest practical safety margins;
    - (ii) proposed *access standards* and *performance standards* to be assessed;
    - (iii) settings of *control systems* and *protection systems* of *plant* and *networks* to be assessed and quantified for maximum practical performance of the *power system*; and
    - (iv) the efficient procurement of *system restart ancillary services* and *network support and control ancillary services*; and
  - (2) identify for each type of data its category in terms of clause S5.5.2.
- (b1) The *Power System Model Guidelines* must specify:
- (1) the information, including the types of models, that:
    - (i) *Generators* must provide under clause 5.2.5(b)(7), clause 5.3.9, clause S5.2.4 and clause S5.5.6;
    - (ii) *Network Service Providers* must provide under clause 4.3.4(j);
    - (iii) *Network Users* must provide under clause S5.3.1(a1);
    - (iv) prospective *NSCAS* tenderers must provide under clause 3.11.5(b)(5); and
    - (v) prospective *SRAS Providers* must provide under clause 3.11.9(g);
  - (2) the model accuracy requirements that are applicable to each type of model provided, as well as the types of *generating systems* and *plant* that the model accuracy requirements apply to;
  - (3) when parties must provide information;

- (4) the reasonable timeframes within which parties and *AEMO* must provide information to each other;
  - (5) a process to be followed in circumstances where a person is unable to provide information required to be provided under clauses 3.11.5(b)(5), 3.11.9(g), 4.3.4(j), 5.2.5(b)(7), 5.3.9(b)(2), S5.2.4, S5.3.1, S5.5.6, schedule 5.5 or as otherwise required by the *Power System Model Guidelines*;
  - (6) guidance on the factors that *AEMO* will take into account when determining the circumstances under which *AEMO* will request information to be provided, including the *power system* conditions that necessitate the usage of a certain type of model in order to achieve the desired level of accuracy;
  - (7) how information is to be provided to *AEMO*, including, for example:
    - (i) the format in which information must be provided;
    - (ii) whether *AEMO* will treat any of the information as *confidential information* under rule 8.6;
    - (iii) any material *AEMO* requires to assess the accuracy of information provided to it
- (c) In developing and amending the *Power System Model Guidelines*, the *Power System Design Data Sheet* and the *Power System Setting Data Sheet*, *AEMO* must:
- (1) have regard to the reasonable costs of efficient compliance by *Registered Participants* with those guidelines and data sheets compared to the likely benefits from the use of the information provided under the guidelines and data sheets;
  - (2) use reasonable endeavours to accept a range of software simulation products and versions; and
  - (3) have regard to any requirements to protect the intellectual property and confidential information of third parties, including where those third parties are not *Registered Participants*.
- (d) *AEMO* may amend the *Power System Model Guidelines*, the *Power System Design Data Sheet* or the *Power System Setting Data Sheet* from time to time.
- (e) Any person may submit a request (with written reasons) for *AEMO* to amend the *Power System Model Guidelines*, the *Power System Design Data Sheet* or the *Power System Setting Data Sheet* from time to time.

- (f) In developing and amending the *Power System Model Guidelines*, the *Power System Design Data Sheet* or the *Power System Setting Data Sheet*, AEMO must, subject to paragraph (g), consult with *Registered Participants* and such other persons who, in AEMO's reasonable opinion have, or have identified themselves as having, an interest in the *Power System Model Guidelines*, in accordance with the *Rules consultation procedures*.
- (g) AEMO is not required to comply with the *Rules consultation procedures* when making minor or administrative amendments to the *Power System Model Guidelines*, the *Power System Design Data Sheet* or the *Power System Setting Data Sheet*.
- (h) AEMO may at the conclusion of the *Rules consultation procedures* under paragraph (f) or otherwise under paragraph (g), amend the relevant data sheet or guidelines (if necessary).

**[28] Schedule 5.5.3 Network and plant technical data of equipment at or near connection point**

In the table in Schedule 5.5.3 under the heading "Circuits Connecting Embedded Generating Units to the Network", omit "*Generating System Model Guidelines*" and substitute "*Power System Model Guidelines*".

**[29] Schedule 5.5.3 Network and plant technical data of equipment at or near connection point**

In the table in Schedule 5.5.3 under the heading "Circuits Connecting Embedded Generating Units to the Network", omit "*Generating System Design Data Sheet*" and substitute "*Power System Design Data Sheet*".

**[30] Schedule 5.5.3 Network and plant technical data of equipment at or near connection point**

In the table in Schedule 5.5.3 under the heading "Circuits Connecting Embedded Generating Units to the Network", omit "*Generating System Setting Data Sheet*" and substitute "*Power System Setting Data Sheet*".

## **Schedule 4            Amendment to the National Electricity Rules**

(Clause 6)

### **[1] Chapter 10            Omitted Definitions**

In Chapter 10, omit the definitions of “*Generating System Design Data Sheet*”, “*Generating System Model Guidelines*” and “*Generating System Setting Data Sheet*”.

### **[2] Chapter 10            New Definitions**

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

#### ***Power System Design Data Sheet***

The data sheet *published* by AEMO under clause S5.5.7(a)(1).

#### ***Power System Model Guidelines***

The guidelines *published* by AEMO under clause S5.5.7(a)(3).

#### ***Power System Setting Data Sheet***

The data sheet *published* by AEMO under clause S5.5.7(a)(2).

**Schedule 5 Savings and Transitional Amendments to the National Electricity Rules**

(Clause 7)

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

In Chapter 11, after Part ZZZ, insert:

**Part ZZZ[x] Generating System Model Guidelines**

**11.99 Making of Power System Model Guidelines**

- (a) By [30 September 2018], AEMO must develop and *publish* the *Power System Model Guidelines*, the *Power System Design Data Sheet*, and the *Power System Setting Data Sheet* to take account of the Amending Rule.