

Electricity Industry Participation Code 2010

Part 8 Common quality

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[Revoked]

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8.1 Contents of this Part

This Part relates to **common quality**. In particular, this Part concerns the performance obligations of the **system operator**, the performance obligations of **asset owners**, arrangements concerning **ancillary services**, and **technical codes**.

Compare: Electricity Governance Rules 2003 rule 1 section I part C

Clause 8.1: amended, on 7 August 2014, by clause 5 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Clause 8.1: amended, on 21 December 2021, by clause 6 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

8.1A [Revoked]

Clause 8.1A: inserted, on 19 January 2017, by clause 4 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2016.

Clause 8.1A: revoked, on 21 December 2021, by clause 7 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

Subpart 1—Performance obligations of the system operator

8.2 Contents of this subpart

This subpart provides for—

- (a) general performance obligations of the **system operator**
- (b) a **policy statement** relating to the **principal performance obligations** of the **system operator**; and

- (c) the review of the **policy statement**.

Compare: Electricity Governance Rules 2003 rule 1 section II part C

8.3 Recovery of costs from causers of harmonic and voltage non-compliance

- (1) If the **system operator** is able to establish who is causing any departure from the standards referred to in clause 7.2(D), the **system operator** must endeavour to recover its reasonable identification and testing costs from that person. If the causer is a **participant**, the **participant** must pay those costs to the **system operator**.
- (2) If the **system operator** is unable to recover its reasonable identification and testing costs, or the causer is not able to be identified, then those costs will form part of the **system operator's identification costs**.

Compare: Electricity Governance Rules 2003 rule 2.3.2 section II part C

Clause 8.3 Heading: amended, on 19 May 2016, by clause 16(1) of the Electricity Industry Participation Code Amendment (System Operator and Alignment with Statutory Objective) 2016.

Clause 8.3(1): amended, on 19 May 2016, by clause 16(2) of the Electricity Industry Participation Code Amendment (System Operator and Alignment with Statutory Objective) 2016.

8.4 System operator may rely on information provided

For the purposes of this Code, the **system operator** may—

- (a) rely on the **assets** and information about the **assets** made available to the **system operator** by **asset owners**; and
- (b) assume that **asset owners** are complying with the **asset owner performance obligations** and the **technical codes**, or complying with a valid **dispensation** or **equivalence arrangement**
- (c) *[Revoked]*

Compare: Electricity Governance Rules 2003 rule 4 section II part C

Clause 8.4: replaced, on 19 January 2017, by clause 5 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2016.

Clause 8.4(b): amended, on 21 December 2021, by clause 8(1) of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

Clause 8.4(c): revoked, on 21 December 2021, by clause 8(2) of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

8.5 Restoration

- (1) If an event disrupts the **system operator's** ability to comply with the **principal performance obligations**, the **system operator** must re-establish normal operation of the power system as soon as possible, given—
- (a) the capability of **generation**, and **ancillary services**; and
- (b) the configuration and capacity of the **grid**; and
- (c) the information made available by **asset owners**.
- (2) When re-establishing normal operation of the power system under subclause (1), the **system operator** must have regard to the following priorities:
- (a) first, the safety of natural persons:
- (b) second, the avoidance of damage to **assets**:
- (c) third, the restoration of **offtake**:
- (d) fourth, conformance with the **principal performance obligations**:
- (e) fifth, full conformance with the **dispatch objective**.

Compare: Electricity Governance Rules 2003 rule 5 section II part C

Clause 8.5(1): amended, on 19 May 2016, by clause 17 of the Electricity Industry Participation Code Amendment (System Operator and Alignment with Statutory Objective) 2016.

Clause 8.5(1)(a): amended, on 7 August 2014, by clause 6 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Clause 8.5(1)(a): amended, on 21 December 2021, by clause 9 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

8.6 System operator may contract for higher levels of common quality

Subject to clause 17.29, nothing in this Code prevents the **system operator** from entering into contracts or arrangements in which levels of quality more stringent than those specified in the **principal performance obligations** are agreed, if the **system operator** can identify the incremental costs of those more stringent levels, and can ensure that those incremental costs are paid to the **system operator** by the persons wishing to enter into that contract or arrangement with the **system operator**.

Compare: Electricity Governance Rules 2003 rule 6 section II part C

8.7 System operator must not contract contrary to this arrangement

Subject to clauses 8.6 and 17.29, the **system operator** must not enter into a contract with another person that is inconsistent with the **system operator's** obligations under this Code and the **technical codes**.

Compare: Electricity Governance Rules 2003 rule 7 section II part C

Policy statement

8.8 System operator to comply with policy statement

Subject to clause 8.14, the **system operator** must comply with the **policy statement**.

Compare: Electricity Governance Rules 2003 rule 8 section II part C

Clause 8.8: amended, on 19 May 2016, by clause 18 of the Electricity Industry Participation Code Amendment (System Operator and Alignment with Statutory Objective) 2016.

8.9 *[Revoked]*

Clause 8.9: revoked, on 10 January 2013, by clause 6 of the Electricity Industry Participation (Policy Statement and Procurement Plan Review Process) Code Amendment 2012.

8.10 Incorporation of policy statement by reference

(1) The **policy statement** is incorporated by reference in this Code.

(2) Clauses 7.13 to 7.22 apply to any amendment or replacement of the **policy statement**.

Compare: Electricity Governance Rules 2003 rule 9 section II part C

Clause 8.10(1): amended, on 10 January 2013, by clause 7 of the Electricity Industry Participation (Policy Statement and Procurement Plan Review Process) Code Amendment 2012.

Clause 8.10(1): amended, on 1 August 2023, by clause 10(1) of the Electricity Industry Participation Code Amendment (System Operation Documents) 2023.

Clause 8.10(2): amended, on 1 August 2023, by clause 10(2) of the Electricity Industry Participation Code Amendment (System Operation Documents) 2023.

Clause 8.10(2): amended, on 1 March 2024, by clause 26 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2024.

8.10A *[Revoked]*

Clause 8.10A: inserted, on 10 January 2013, by clause 8 of the Electricity Industry Participation (Policy Statement and Procurement Plan Review Process) Code Amendment 2012.

Clause 8.10A(1): amended, on 5 October 2017, by clause 82 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 8.10A: revoked, on 1 August 2023, by clause 11 of the Electricity Industry Participation Code Amendment (System Operation Documents) 2023.

8.10B *[Revoked]*

Clause 8.10B: inserted, on 10 January 2013, by clause 8 of the Electricity Industry Participation (Policy Statement and Procurement Plan Review Process) Code Amendment 2012.

Clause 8.10B: revoked, on 1 August 2023, by clause 12 of the Electricity Industry Participation Code Amendment (System Operation Documents) 2023.

8.10C *[Revoked]*

Clause 8.10C: inserted, on 10 January 2013, by clause 8 of the Electricity Industry Participation (Policy Statement and Procurement Plan Review Process) Code Amendment 2012.

Clause 8.10C(3): amended, on 5 October 2017, by clause 83 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 8.10C: revoked, on 1 August 2023, by clause 13 of the Electricity Industry Participation Code Amendment (System Operation Documents) 2023.

8.11 Content of policy statement

(1) *[Revoked]*

(2) *[Revoked]*

(3) **A policy statement must include—**

- (a) the policies and means that the **system operator** considers appropriate for the **system operator** to observe in complying with its **principal performance obligations**; and
- (b) the policies and means by which scheduling and **dispatch** are adjusted to meet the **dispatch objective**, and must include the provision of a **dispatch** process statement. The **dispatch** process statement must contain the details of the processes that enable the **system operator** to meet the **dispatch objective**, including the methodologies to be used by the **system operator** for planning to meet the **dispatch objective** during the period leading up to real time and meeting the **dispatch objective** in real time; and
- (c) a policy setting out how the **system operator** will manage any conflict of interest that arises in the performance of its obligations under this Code; and
- (d) a statement of the reasons for adopting the policies and means set out in the **policy statement** (which statement must be regarded as an explanatory note only and does not form part of the policies itself); and
- (e) a statement of how future policies and means might be formulated and implemented.

Compare: Electricity Governance Rules 2003 rule 10 section II part C

Clause 8.11 Heading: substituted, on 10 January 2013, by clause 9(a) of the Electricity Industry Participation (Policy Statement and Procurement Plan Review Process) Code Amendment 2012.

Clause 8.11 Heading: amended, on 1 August 2023, by clause 14(1) of the Electricity Industry Participation Code Amendment (System Operation Documents) 2023.

Clause 8.11(1): revoked, on 10 January 2013, by clause 9(b) of the Electricity Industry Participation (Policy Statement and Procurement Plan Review Process) Code Amendment 2012.

Clause 8.11(2): revoked, on 10 January 2013, by clause 9(c) of the Electricity Industry Participation (Policy Statement and Procurement Plan Review Process) Code Amendment 2012.

Clause 8.11(3): amended, on 10 January 2013, by clause 9(d) of the Electricity Industry Participation (Policy Statement and Procurement Plan Review Process) Code Amendment 2012.

Clause 8.11(3): amended, on 19 May 2016, by clause 19(1) of the Electricity Industry Participation Code Amendment (System Operator and Alignment with Statutory Objective) 2016.

Clause 8.11(3)(c): amended, on 19 May 2016, by clause 19(2) of the Electricity Industry Participation Code Amendment (System Operator and Alignment with Statutory Objective) 2016.

Clause 8.11(3): amended, on 1 August 2023, by clause 14(2) of the Electricity Industry Participation Code Amendment (System Operation Documents) 2023.

8.11A *[Revoked]*

Clause 8.11A: inserted, on 10 January 2013, by clause 10 of the Electricity Industry Participation (Policy Statement and Procurement Plan Review Process) Code Amendment 2012.

Clause 8.11A(3)(b): amended, on 5 October 2017, by clause 84 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 8.11A: revoked, on 1 August 2023, by clause 15 of the Electricity Industry Participation Code Amendment (System Operation Documents) 2023.

8.12 *[Revoked]*

Compare: Electricity Governance Rules 2003 rule 11 section II part C

Clause 8.12: substituted, on 10 January 2013, by clause 11 of the Electricity Industry Participation (Policy Statement and Procurement Plan Review Process) Code Amendment 2012.

Clause 8.12(1), (2), (4) and (6): amended, on 5 October 2017, by clause 85(1) and (2) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 8.12: revoked, on 1 August 2023, by clause 16 of the Electricity Industry Participation Code Amendment (System Operation Documents) 2023.

8.12A *[Revoked]*

Clause 8.12A: inserted, on 10 January 2013, by clause 12 of the Electricity Industry Participation (Policy Statement and Procurement Plan Review Process) Code Amendment 2012.

Clause 8.12A(4)(a) and (6): amended, on 5 October 2017, by clause 86 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 8.12A: revoked, on 1 August 2023, by clause 17 of the Electricity Industry Participation Code Amendment (System Operation Documents) 2023.

8.12B *[Revoked]*

Clause 8.12B: inserted, on 10 January 2013, by clause 12 of the Electricity Industry Participation (Policy Statement and Procurement Plan Review Process) Code Amendment 2012.

Clause 8.12B(b): amended, on 5 October 2017, by clause 87 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 8.12B: revoked, on 1 August 2023, by clause 18 of the Electricity Industry Participation Code Amendment (System Operation Documents) 2023.

8.13 *[Revoked]*

Compare: Electricity Governance Rules 2003 rule 12 section II part C

Clause 8.13: revoked, on 10 January 2013, by clause 13 of the Electricity Industry Participation (Policy Statement and Procurement Plan Review Process) Code Amendment 2012.

8.14 Departure from policy statement

- (1) The **system operator** may depart from the policies set out in a **policy statement** when a **system security situation** arises and such departure is required for the **system operator** to comply with clause 7.1A(1).
- (2) If the **system operator** departs from a **policy statement** under subclause (1), the **system operator** must provide a report to the **Authority** setting out the circumstances of the **system security situation** and the actions taken to deal with it.
- (3) The **Authority** must **publish** the report within a reasonable time after receiving it.

Compare: Electricity Governance Rules 2003 rule 13 section II part C

Clause 8.14(1): amended, on 19 May 2016, by clause 20(1) of the Electricity Industry Participation Code Amendment (System Operator and Alignment with Statutory Objective) 2016.

Clause 8.14(2): amended, on 19 May 2016, by clause 20(2) of the Electricity Industry Participation Code Amendment (System Operator and Alignment with Statutory Objective) 2016.

Clause 8.14(3): substituted, on 10 January 2013, by clause 14 of the Electricity Industry Participation (Policy Statement and Procurement Plan Review Process) Code Amendment 2012.

Clause 8.14(3): amended, on 5 October 2017, by clause 88 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

System security forecast

8.15 System operator to prepare and review system security forecast

- (1) Every 2 years, the **system operator** must prepare, **publish**, and provide to the **Authority** a **system security forecast**.
- (1A) The **system security forecast** must—
 - (a) identify risks to the **system operator's** ability to meet the **principal performance obligations** over the ensuing period of not less than 36 months, and indicate how those risks can be managed; and
 - (b) take into account the capabilities of the **grid** and connected **assets** based on information known to, and able to be disclosed by, the **system operator**.
- (2) The date by which the **system operator** must **publish** the **system security forecast** and provide it to the **Authority** in each year in which the **system operator** is required to do so, is the date established for that purpose under rule 15 of section II of part C of the **rules**.
- (3) The **system operator** must review the most recent **system security forecast** prepared in accordance with subclause (1) at 6 monthly intervals until a new forecast or update is prepared. If, in the reasonable opinion of the **system operator**, a change has been made to the power system that would materially affect the most recent forecast or update, the **system operator** must amend the **system security forecast**, **publish** it and provide it to the **Authority**.

Compare: Electricity Governance Rules 2003 rule 15 section II part C

Clause 8.15(1): substituted, on 21 September 2012, by clause 8 of the Electricity Industry Participation (Minor Amendments) Code Amendment 2012.

Clause 8.15(1A): inserted, on 21 September 2012, by clause 8 of the Electricity Industry Participation (Minor Amendments) Code Amendment 2012.

Clause 8.15(1A)(b): amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

Clause 8.15(1A)(b): amended, on 5 October 2017, by clause 89 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Subpart 2—Asset owner performance obligations and technical standards

8.16 Contents of this subpart

This subpart provides for—

- (a) the establishment of performance obligations and technical standards for **asset owners** to assist the **system operator** in complying with the **principal performance obligations**; and
- (b) **asset owners** to obtain an assessment of their **assets** from the **system operator**; and
- (c) a process for the **system operator** to approve applications for **equivalence arrangements** and **dispensations** (if necessary).

Compare: Electricity Governance Rules 2003 rule 1 section III part C

Asset owner performance obligations and technical standards concerning frequency

8.17 Contribution by injections to overall frequency management

Each **generator** (while **synchronised**) and the **HVDC owner** must at all times ensure that its **assets**, other than any **generating units** within an **excluded generating station**, make the maximum possible **injection** contribution to maintain frequency within the **normal band** (and to restore frequency to the **normal band**). Any such contribution must be assessed against the **technical codes**.

Compare: Electricity Governance Rules 2003 rule 2.1 section III part C

8.18 Contributions by purchasers to overall frequency management

Each **purchaser** must limit the magnitude of any instantaneous change in the **offtake** of **electricity** and net rate of change in **offtake** to the levels the **system operator** reasonably requires. In setting those requirements, the **system operator** must have regard to the impact of the **offtake** on the **system operator's** ability to comply with the **principal performance obligations** concerning frequency (as set out in clause 7.2A to 7.2C) and the **dispatch objective**.

Compare: Electricity Governance Rules 2003 rule 2.2 section III part C

Clause 8.18: amended, on 19 May 2016, by clause 21 of the Electricity Industry Participation Code Amendment (System Operator and Alignment with Statutory Objective) 2016.

8.19 Contributions to frequency support in under-frequency events

- (1) Subject to subclause (3), each **generator** must at all times ensure that, while **electrically connected**, its **assets**, other than any **excluded generating stations**, contribute to supporting frequency by remaining **synchronised**, ensuring that each of its **generating units** can and does, at a minimum, sustain pre-event output—
 - (a) at all times when the frequency is above 47.5 Hertz; and
 - (b) for at least 120 seconds when the frequency is 47.5 Hertz; and
 - (c) for at least 20 seconds when the frequency is 47.3 Hertz; and
 - (d) for at least 5 seconds when the frequency is 47.1 Hertz; and
 - (e) for at least 0.1 seconds when the frequency is 47.0 Hertz; and
 - (f) at any frequencies between those specified in paragraphs (b) to (e) for times derived by linear interpolation.
- (2) If the **inherent characteristics** and design of a **generator's generating unit** are such that it is reasonably able to operate beyond the above requirements, the **generator** must declare such capabilities in accordance with clause 2(5) of **Technical Code A** of Schedule 8.3.
- (3) Each South Island **generator** must ensure that each of its **assets**, other than **excluded generating units**, remains **synchronised**, and can and do, at a minimum, sustain pre-event output—
 - (a) at all times when the frequency is above 47 Hertz; and
 - (b) for 30 seconds if the frequency falls below 47 Hertz but not below 45 Hertz.
- (4) The **HVDC owner** must at all times ensure that, while **electrically connected**, its **assets** contribute to supporting frequency during an **under-frequency event** in either **island**

by—

- (a) remaining **electrically connected** to those **assets** making up the **grid** in the North Island and South Island while the frequency in both **islands** remains above 48 Hertz; and
 - (b) remaining **electrically connected** to those **assets** making up the **grid** in the North Island and South Island while the frequency in both **islands** remains below 48 Hertz and above 47 Hertz for 90 seconds; and
 - (c) remaining **electrically connected** to those **assets** making up the **grid** in the North Island and South Island while the frequency in both **islands** remains above 45 Hertz for 35 seconds, unless the frequency in either **island** is less than 46.5 Hertz and the frequency is falling at a rate of 7 Hertz per second or greater; and
 - (d) subject to the level of transfer and the **HVDC link configuration** at the beginning of the **under-frequency event**, if the **HVDC link** itself is not the cause of the **under-frequency event**, modifying the instantaneous transfer on the **HVDC link** by up to 250 MW with the objective of limiting the difference between the North Island and South Island frequencies to no greater than 0.2 Hertz.
- (5) Each North Island **connected asset owner** and each South Island **grid owner** must ensure that it has established and maintained **automatic under-frequency load shedding** in block sizes and with relay settings in accordance with the **technical codes**.

Compare: Electricity Governance Rules 2003 rule 2.3 section III part C

Clause 8.19(5): substituted, on 7 August 2014, by clause 7 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Clause 8.19(1) and (4): amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

Clause 8.19(1) and (4): amended, on 5 October 2017, by clause 90 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 8.19(5): amended, on 21 December 2021, by clause 10 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

Clause 8.19(4)(d): amended, on 1 March 2024, by clause 27 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2024.

8.20 Contributions by grid owners to frequency support

Each **grid owner** must ensure that its **assets** are capable of being operated, and operate, within the frequency targets set out in clause 7.2A.

Compare: Electricity Governance Rules 2003 rule 2.4 section III part C

Clause 8.20: amended, on 19 May 2016, by clause 22 of the Electricity Industry Participation Code Amendment (System Operator and Alignment with Statutory Objective) 2016.

8.21 Excluded generating stations

- (1) For the purposes of clauses 8.17, 8.19, 8.25D, and the provisions in **Technical Code A** of Schedule 8.3 relating to the obligations of **asset owners** in respect of frequency, an **excluded generating station** means a **generating station** that exports less than 30 MW to a **local network** or the **grid**, unless the **Authority** has issued a direction under clause 8.38 that the **generating station** must comply with clauses 8.17, 8.19, 8.25A, and 8.25B and the relevant provisions in **Technical Code A** of Schedule 8.3.
- (2) Whether likely to be an **excluded generation station** or not, a **generator** who is planning to connect to the **grid** or a **local network** a **generating unit** with rated net maximum capacity equal to or greater than 1 MW must provide the **system operator** with written advice of its intention to connect together with other information relating to

that **generating unit** in accordance with clause 8.25(4).

Compare: Electricity Governance Rules 2003 rules 2.5 and 2.6 section III part C

Clause 8.21(1): amended, on 24 November 2016, by clause 5(1) and (2) of the Electricity Industry Participation Code Amendment (Generation Fault Ride Through) 2016.

Clause 8.21(2): amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

Clause 8.21(2): amended, on 5 October 2017, by clause 91 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Asset owner performance obligations and technical standards concerning voltage

8.22 Voltage range AOPOs

- (1) Each **grid owner** must ensure that its **assets** at and in between—
- (a) the **high voltage terminals** of the **grid owner's** transformers at each **grid injection point** and **grid exit point**; or
 - (b) if no transformer exists, the relevant **grid injection point** or **grid exit point**—
- are capable of being operated within the following range of voltages:

Nominal grid voltage (kV)	Voltage limits			
	Minimum (kV)		Maximum (kV)	
220	198	-10.0%	242	10.0%
110	99	-10.0%	121	10.0%
66	62.7	-5.0%	69.3	5.0%
50	47.5	-5.0%	52.5	5.0%

- (2) Each **generator** with a **point of connection** to the **grid** must at all times ensure that its **assets** are capable of being operated, and do operate, when the **grid** is operated within the range of voltages set out in subclause (1).
- (3) Each **connected asset owner** must ensure that its **local network** is capable of being operated, and does operate, when the **grid** is operated over the range of voltages set out in subclause (1).

Compare: Electricity Governance Rules 2003 rule 3.1 section III part C

Clause 8.22(3): amended, on 1 February 2016, by clause 8 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

8.23 Voltage support AOPOs

Each **generator** with a **point of connection** to the **grid** must at all times ensure that its **assets**—

- (a) when the voltage at its **grid injection point** is within the applicable range of nominal voltage, are capable of exporting (over excited) when **synchronised** and made available for **dispatch** by the **system operator**, a minimum net **reactive power** which is 50% of the maximum continuous **MW** output power as measured at the following **generating unit** terminals:

Nominal grid voltage (kV)	Voltage range for which reactive power is required			
	Minimum (kV)		Maximum (kV)	
220	198	-10.0%	242	10.0%
110	99	-10.0%	121	10.0%
66	62.7	-5.0%	69.3	5.0%
50	47.5	-5.0%	52.5	5.0%
33	31.35	-5.0%	34.65	5.0%
22	21.45	-2.5%	22.55	2.5%
11	10.725	-2.5%	11.275	2.5%

- (b) when the voltage at its **grid injection point** is within the applicable range of nominal voltage, are capable of importing (under excited) when **synchronised** and made available for **dispatch** by the **system operator**, a minimum net **reactive power** which is 33% of the maximum continuous **MW** output power as measured at the **generating unit** terminals as set out below:

Nominal grid voltage (kV)	Voltage range for which reactive power is required			
	Minimum (kV)		Maximum (kV)	
220	209	-5.0%	242	10.0%
110	104.5	-5.0%	121	10.0%
66	62.7	-5.0%	69.3	5.0%
50	47.5	-5.0%	52.5	5.0%
33	31.35	-5.0%	34.65	5.0%
22	21.45	-2.5%	22.55	2.5%
11	10.725	-2.5%	11.275	2.5%

- (c) when **synchronised**, continuously operate in a manner that supports voltage and voltage stability on the **grid** in compliance with the **technical codes**.

Compare: Electricity Governance Rules 2003 rule 3.2 section III part C
Clause 8.23: amended, on 21 September 2012, by clause 9 of the Electricity Industry Participation (Minor Amendments) Code Amendment 2012.

8.24 Load shedding obligations to support voltage

- (1) If it is not possible for a **connected asset owner** to comply with subclause (2), the **grid owner** must, if possible, establish load shedding in block sizes and at voltage levels (and, if automatic systems are established, with relay settings) set out in the **technical codes** or otherwise as the **system operator** reasonably requires.
- (2) In order to prevent the collapse of the **network** voltage, each **connected asset owner** must ensure that, if possible, it has established load shedding in block sizes and at voltage levels (and, if automatic systems are established, with relay settings) in accordance with the **technical codes** or otherwise as the **system operator** reasonably requires.

Compare: Electricity Governance Rules 2003 rule 3.3 section III part C

Clause 8.24(1): amended, on 1 February 2016, by clause 9 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Clause 8.24(2): amended, on 1 May 2016, by clause 4 of the Electricity Industry Participation Code Amendment (Minor Code Amendments) 2016.

8.25 Other asset owner performance obligations and technical standards

- (1) Each **grid owner** must ensure that the design and configuration of its **assets** (including its connections to other persons) and associated protection arrangements are consistent with the **technical codes** and, in the reasonable opinion of the **system operator**, with maintaining the **system operator's** ability to comply with the **principal performance obligations**. In reaching this opinion, the **system operator** must have regard to the potential impact of the design or configuration of those **assets** or associated protection arrangements on its compliance with the **principal performance obligations** and achievement of the **dispatch objective**.
- (2) Each **grid owner** and each **connected asset owner** must use reasonable endeavours to ensure that a **generator** who meets the following criteria provides the **system operator** with written advice of the existence of its **generating unit** and the **generator's** name and address:
 - (a) the **generator** is directly connected to the **grid owner's grid** or directly or indirectly connected to the **local network** (as the case may be):
 - (b) the **generator** has a **generating unit** with a rated net maximum capacity equal to or greater than 1 **MW**.
- (3) Each **asset owner** and each **purchaser** must provide communication facilities that comply with the **technical codes** or otherwise, as the **system operator** reasonably requires, which must assist the **system operator** in planning to comply, and complying, with its **principal performance obligations** and achieving the **dispatch objective**.
- (4) Each **asset owner** and each **purchaser** must provide information that complies with the **technical codes** or otherwise as the **system operator** reasonably requests, to assist the **system operator** in planning to comply, and complying, with its **principal performance obligations** and achieving the **dispatch objective**.
- (5) If the **system operator** reasonably considers it necessary to assist the **system operator** in planning to comply, and complying, with the **principal performance obligations** and achieving the **dispatch objective**, the **system operator**—
 - (a) may require that an **embedded generator** provide information regarding the intended output of each **embedded generating station** greater than 10 **MW** in capacity, that must be either—
 - (i) submitted as an **offer** in accordance with subpart 1 of Part 13; or
 - (ii) provided in a form and manner agreed between the **system operator** and the **embedded generator**; and
 - (b) must advise the **embedded generator** of its requirement at least 20 **business days** in advance of the requirement coming into effect.
- (6) If the **system operator** reasonably considers it necessary to assist it in planning to comply, and complying, with the **principal performance obligations** and achieving the **dispatch objective**, the **system operator** may apply to the **Authority** to require an **embedded generator** to provide information regarding the intended output of a group of **embedded generating stations** that total greater than 10 **MW** in capacity and that

are connected to the same **grid exit point**. If the **Authority** approves the **system operator's** request, the information must be provided to the **system operator** by the relevant **embedded generator** in a form and manner determined by the **Authority**.

Compare: Electricity Governance Rules 2003 rule 4.1 to 4.6 section III part C

Clause 8.25(1), (2) and (6): amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

Clause 8.25(1), (2) and (6): amended, on 5 October 2017, by clause 92(1) and (2) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 8.25(2): amended, on 1 February 2016, by clause 10 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Clause 8.25(2): amended, on 20 December 2021, by clause 10 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2019.

Clause 8.25(5)(b): amended, on 5 October 2017, by clause 92(3) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 8.25(5)(b): amended, on 1 November 2018, by clause 11 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2018.

8.25A Fault ride through

- (1) Each **generator** must ensure that each of its **assets**, when **electrically connected** to a **network**, is capable of remaining stable and **electrically connected** when the **grid's** lowest **line-to-line** voltage is within the no-trip zone shaded and marked "No-trip zone" in Figure 8.1 (for an **asset** in the North Island) or Figure 8.2 (for an **asset** in the South Island) for the period of 6 seconds immediately following the commencement of a zero impedance three-phase short circuit fault, or an unbalanced short circuit fault, on any part of the **grid** at 110 kV or 220 kV in the **island** in which the **asset** is connected.
- (2) Each **generator** must ensure that each of its **assets**, when **electrically connected** to a **network**, is capable of remaining stable and **electrically connected** when the highest **line-to-line** voltage at Haywards 220 kV bus (for an **asset** in the North Island) or Benmore 220 kV bus (for an **asset** in the South Island) is within the no-trip zone shaded and marked "No-trip zone" in Figure 8.3 for the period of 1 second immediately following the commencement of a trip of the **HVDC link**.
- (3) Whether a **generator** is complying with subclause (2) must be determined using power system analysis that uses—
 - (a) study cases provided by the relevant **grid owner**; and
 - (b) relevant system assumptions provided by the **system operator**.
- (4) A **generator** is not required to comply with subclause (1) in respect of an **asset** in the event of a fault of a type described in subclause (1) if the **asset** becomes isolated from the **grid** as a result of the fault.
- (5) A **generating unit** need not comply with subclause (1) to the extent that it is complying with a **special protection scheme** approved by the **system operator**.
- (6) The absolute **grid** voltage (per unit) shown on the Y axis of Figure 8.1 and Figure 8.2 is the ratio of **grid** lowest **line-to-line** voltage on a **line** to the nominal operating voltage of the **line** (that is, 110 kV or 220 kV).

Figure 8.1: North Island no-trip zone during 110 kV or 220 kV faults

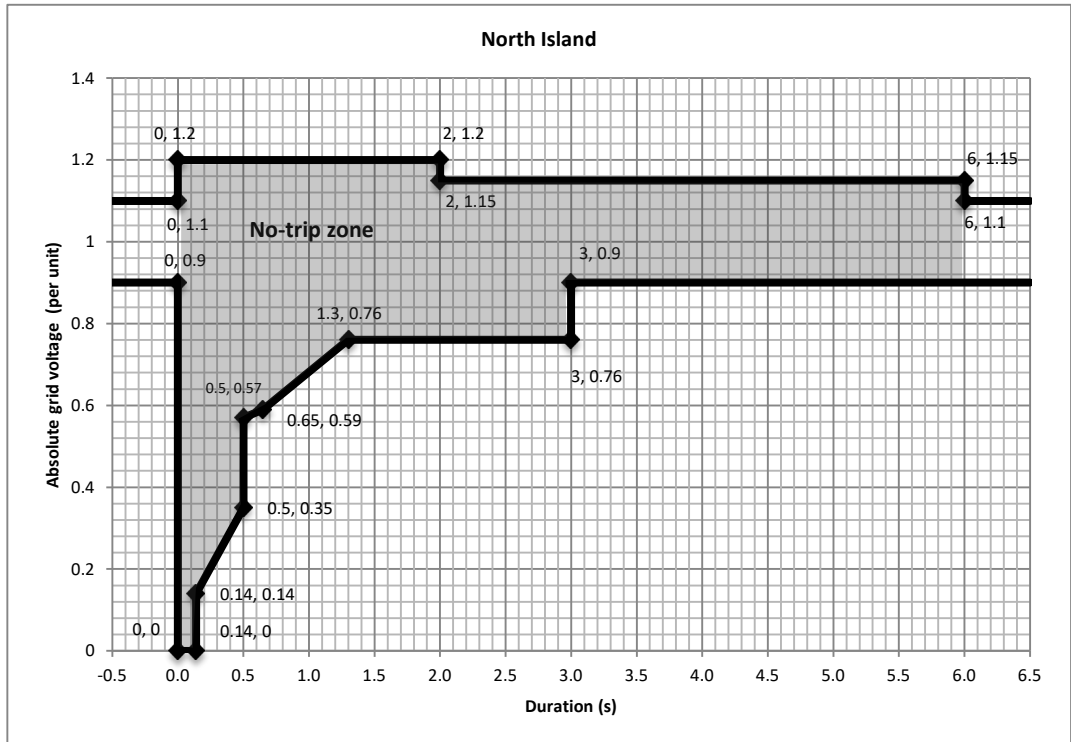


Figure 8.2: South Island no-trip zone during 110 kV or 220 kV faults

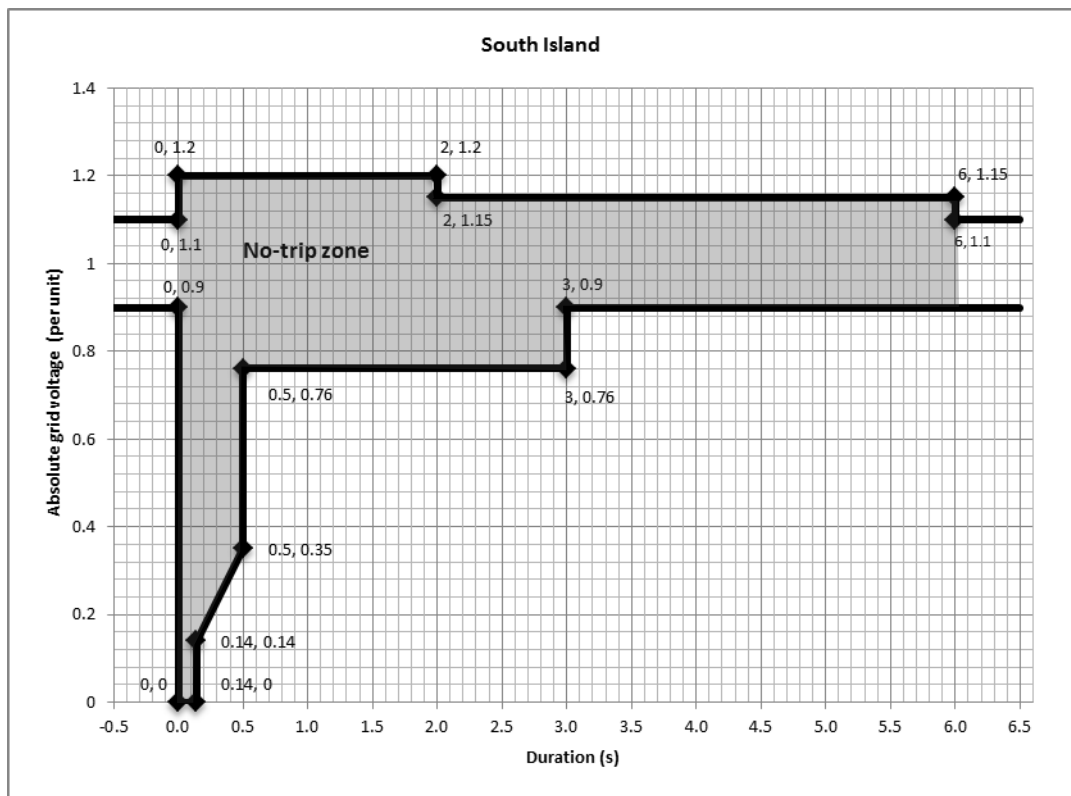
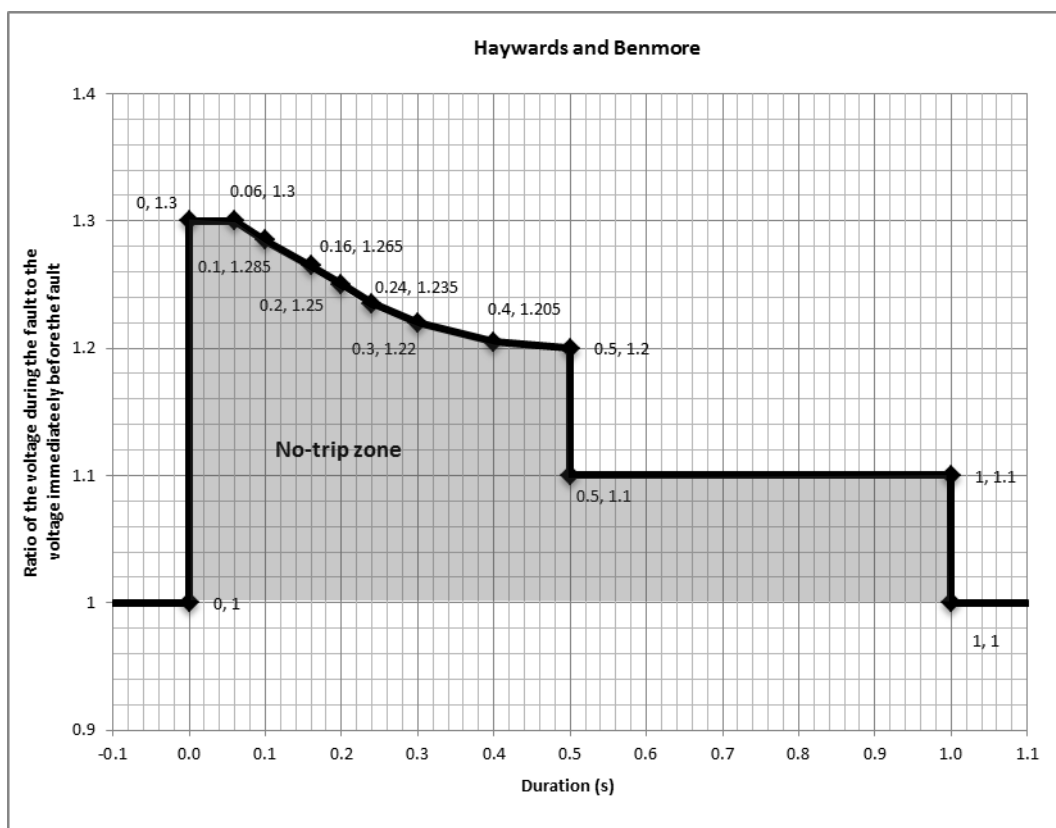


Figure 8.3: Haywards and Benmore no-trip zone during permanent loss of the HVDC link



Clause 8.25A Figure 8.1, Figure 8.2 and Figure 8.3: inserted, on 24 November 2016, by clause 6 of the Electricity Industry Participation Code Amendment (Generation Fault Ride Through) 2016.

Clause 8.25A(1): amended, on 5 October 2017, by clause 93(1) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 8.25A(2): amended, on 5 October 2017, by clause 93(2) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

8.25B Reactive current and active power output

- (1) Each **generator** must ensure that each of its **generating units** generates **reactive current** to oppose the change in its terminal voltage without exceeding the maximum transient **reactive current** specified in the **generator's asset capability statement** for the period of 6 seconds immediately following the commencement of a fault on the **grid** of a type described in clause 8.25A(1).
- (2) Each **generator** must ensure that each of its **generating units** provides **active power** output relative to pre-fault **active power** output at least in proportion to the **grid** voltage at the **grid injection point** for the period of 6 seconds immediately following the clearance of a fault on the **grid** of a type described in clause 8.25A(1).
- (3) Subclause (2) does not apply to a **wind generating station** if there has been a reduction in the intermittent wind power source during the 6 seconds following the commencement of the fault.

Clause 8.25B: inserted, on 24 November 2016, by clause 6 of the Electricity Industry Participation Code Amendment (Generation Fault Ride Through) 2016.

8.25C Use of additional equipment

A **generator** may comply with clause 8.25A in relation to a **generating station** by—

- (a) ensuring that the performance of **generating units** that comprise the **generating station** comply; or

- (b) installing additional equipment within the **generating station**; or
- (c) a combination of the methods described in paragraphs (a) and (b).

Clause 8.25C: inserted, on 24 November 2016, by clause 6 of the Electricity Industry Participation Code Amendment (Generation Fault Ride Through) 2016.

8.25D Application

Clauses 8.25A and 8.25B do not apply—

- (a) to a **wind generating station** when it operates at less than 5% of rated **MW**; or
- (b) to any **asset** at an **excluded generating station**.

Clause 8.25D: inserted, on 24 November 2016, by clause 6 of the Electricity Industry Participation Code Amendment (Generation Fault Ride Through) 2016.

8.26 Asset owners must co-operate

Each **asset owner** and each **purchaser** must co-operate with the **system operator** as may reasonably be required by the **system operator** in carrying out its functions.

Compare: Electricity Governance Rules 2003 rule 4.7 section III part C

Compliance

8.27 System operator to monitor compliance

- (1) To the extent possible, given the information made available by **asset owners**, the **system operator** must monitor, in the manner set out in the **policy statement**, the ongoing compliance of **asset owners** with the **asset owner performance obligations** and the **technical codes**. To avoid doubt, the **system operator** has no monitoring obligations under this subpart other than those set out in the **policy statement**.
- (2) The **system operator** has a discretion to not **dispatch** an **asset** or configuration of **assets**, if it is not satisfied that the **assets** or configuration of **assets** comply with the relevant **asset owner performance obligations** or provisions of the **technical codes**, or that the **asset owner** has and is complying with a valid **equivalence arrangement** or **dispensation** from the relevant **asset owner performance obligations** or provisions of the **technical codes**.
- (3) The **system operator** must immediately advise an **asset owner** if the **system operator** has reasonable grounds to believe that the **asset owner** is not complying with an **asset owner performance obligation**, **equivalence arrangement** or **dispensation**, and that the **asset owner**—
 - (a) does not have a valid **equivalence arrangement** or **dispensation** from the relevant **asset owner performance obligations** or provisions of the **technical codes**: or
 - (b) is not complying with a valid **equivalence arrangement** or **dispensation** from the relevant **asset owner performance obligations** or provisions of the **technical codes**.

Compare: Electricity Governance Rules 2003 rule 5 section III part C

Clause 8.27(2): amended, on 19 May 2016, by clause 23 of the Electricity Industry Participation Code Amendment (System Operator and Alignment with Statutory Objective) 2016.

8.28 Responsibility for compliance

- (1) Each **asset owner** must comply with the **asset owner performance obligations** and **technical codes** at all times and must satisfy the **system operator**, whenever requested by the **system operator** acting reasonably, that each of its **assets** or configuration of **assets** complies with the **asset owner performance obligations** and **technical codes** that apply to that **asset** or configuration of **assets**.
- (2) If the **system operator** advises an **asset owner** under clause 8.27(3), the **asset owner** must co-operate with the **system operator** and use reasonable endeavours to restore compliance as soon as practicable.
- (3) During a period of **commissioning** or testing of **assets**, the **asset owner performance obligations** and **technical codes** do not apply to the **asset owner** in respect of the **assets**, if—
 - (a) the obligations that do not apply to the **asset owner** are specified in the agreed **commissioning** plan or testing plan; and
 - (b) during the period of non-compliance the **asset owner** complies with a **commissioning** plan or testing plan (as appropriate) agreed with the **system operator**; and
 - (c) the period of non-compliance is no longer than the agreed **commissioning** plan or testing plan; and
 - (d) subject to subclause (4), if an **asset owner** during a period of non-compliance meets the requirements of paragraphs (a) to (c), neither the **asset owner** nor the **system operator** is liable under this Code in relation to the non-compliance, except that the **asset owner** is not relieved of liability in the case of a negligent act or omission by the **asset owner**.
- (4) During any period of non-compliance, the non-compliant **asset owner** must pay the readily identifiable and quantifiable costs associated with its non-compliance, including the costs of the **system operator** purchasing additional **ancillary services** required as a consequence of its non-compliance.

Compare: Electricity Governance Rules 2003 rule 6 section III part C

Clause 8.28(2): amended, on 1 November 2018, by clause 12 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2018

Clause 8.28(3): amended, on 5 October 2017, by clause 94 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Equivalence arrangements and dispensations

8.29 Right to apply for approval of equivalence arrangement or grant of dispensation

- (1) Subject to subclause (2), if an **asset owner** cannot comply with an **AOPO** or a **technical code** obligation in respect of a particular **asset** or configuration of **assets**, being an existing, new or proposed **asset**, the **asset owner** may apply for an **equivalence arrangement** to be approved or **dispensation** to be granted in accordance with Schedule 8.1.
- (2) The **system operator** may not grant a dispensation in relation to an obligation to provide **automatic under-frequency load shedding** under clause 8.19(5) or Schedule 8.3, Technical Code B, clause 7.

Compare: Electricity Governance Rules 2003 rule 7.1 section III part C
Clause 8.29(1): amended, on 7 August 2014, by clause 8(1) of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.
Clause 8.29(2): inserted, on 7 August 2014, by clause 8(2) of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.
Clause 8.29(2): amended, on 21 December 2021, by clause 11 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

8.30 Approval of equivalence arrangements

The **system operator** must approve an **equivalence arrangement** if it has received satisfactory evidence that the **asset owner** will put in place on the agreed date technical or commercial arrangements that will, in the reasonable opinion of the **system operator**, achieve compliance with the **AOPO** or **technical code** for which the **equivalence arrangement** is sought, even if the **assets** or configuration of **assets** do not strictly comply.

Compare: Electricity Governance Rules 2003 rule 7.2 section III part C

8.31 Grant of dispensations

- (1) Subject to subclause (1A), the **system operator** must grant a **dispensation** to an **asset owner** who has or will have **assets** or a configuration of **assets** that do not comply with either an **AOPO** or **technical code** if the **system operator** has a reasonable expectation that it can continue to operate the existing system and meet its **principal performance obligations** and if the **system operator** can readily quantify the costs on other persons of that **dispensation**, despite the non-compliance of the **assets**, but—
- if the approval of a **dispensation** could impose readily identifiable and quantifiable costs on other persons, a condition of the **dispensation** must be that the **asset owner** is liable to pay the **system operator** for those costs, including the costs of the **system operator** purchasing any other **ancillary services** required as a consequence of its **dispensation**; and
 - the **asset owner** must acknowledge that the granting of a **dispensation** does not guarantee that the **system operator** will **dispatch** that **asset** for which the **dispensation** was granted, as **dispatch** will only occur in accordance with the **dispatch objective**; and
 - if the **dispensation** is a **generating unit dispensation** from clause 8.19(1) or (3), the **generator** must be allocated the following costs in a relevant **trading period** with respect to paragraph (a) for each of **fast instantaneous reserves** or **sustained instantaneous reserves**:

$$\text{DispCost}_{\text{GENxt}} = 0.5 * Q_{\text{GENxt}} * P_{\text{IRt}}$$

where

DispCost_{GENxt} is the cost payable by a **generator** for **generating unit x** in any **trading period t** in which a class of **instantaneous reserves** is procured as a direct result of that **generating unit's dispensation** to ensure that the frequency does not fall below 47 Hertz or, in the South Island, below the **minimum South Island frequency**

- Q_{GENxt}** is the **MW** amount by which **generating unit x** is unable to sustain pre-event output in **trading period t** with reference to clause 8.19(1) or (3) (as the case may be) as determined from the capabilities specified in that **generating unit's dispensation** (different amounts may be specified with respect to each class of **instantaneous reserves**)
- P_{IRt}** is the **final reserve price** for **fast instantaneous reserves** or **sustained instantaneous reserves** (as the case may be) in **trading period t** in the relevant **island**.

- (1A) If the **system operator** grants a **dispensation** from clause 8.25A or clause 8.25B to an **asset owner** under subclause (1), and the granting of the **dispensation** could impose readily identifiable and quantifiable costs on any other person, the **system operator** must not impose a condition on the **asset owner** in accordance with subclause (1)(a) that has effect earlier than 24 November 2018.
- (2) The **system operator** may impose other reasonable conditions on the grant of a **dispensation** under subclause (1), including conditions as to duration of the **dispensation**.

Compare: Electricity Governance Rules 2003 rules 7.3 and 7.4 section III part C

Clause 8.31(1): amended, on 15 May 2014, by clause 7 of the Electricity Industry Participation (Minor Code Amendments) Code Amendment 2014.

Clause 8.31(1): amended, on 24 November 2016, by clause 7(1) of the Electricity Industry Participation Code Amendment (Generation Fault Ride Through) 2016.

Clause 8.31(1)(c): amended, on 19 May 2016, by clause 24 of the Electricity Industry Participation Code Amendment (System Operator and Alignment with Statutory Objective) 2016.

Clause 8.31(1A): inserted, on 24 November 2016, by clause 7(2) of the Electricity Industry Participation Code Amendment (Generation Fault Ride Through) 2016.

8.32 Liability of asset owner pending decision

Pending determination of an **asset owner's** application for a **dispensation** or an **equivalence arrangement**, if the **asset** does not comply with the **AOPOs** or the **technical codes**, the **asset owner** is liable for the non-compliance and is responsible for additional costs incurred by the **system operator** or **asset owners** as a result of the non-compliance, including the costs of the **system operator** purchasing other **ancillary services** as a consequence of the non-compliance.

Compare: Electricity Governance Rules 2003 rule 8 section III part C

Clause 8.32: amended, on 15 May 2014, by clause 8 of the Electricity Industry Participation (Minor Code Amendments) Code Amendment 2014.

8.33 Modification of equivalence arrangement or dispensation

An **asset owner** may apply to the **system operator** for a modification to an **equivalence arrangement** or **dispensation**, in which case clauses 8.34 to 8.36 and Schedule 8.1 apply.

Compare: Electricity Governance Rules 2003 rule 8.1 section III part C

8.34 Cancellation of equivalence arrangement or dispensation

- (1) An **asset owner** may at any time give written notice to the **system operator** for an

equivalence arrangement or a **dispensation** to be cancelled on the grounds that the **asset** or configuration of **assets** subject to the **equivalence arrangement** or **dispensation** complies with **APOOs** or **technical codes**.

- (2) A cancellation takes effect on the date specified in the notice as being the date the **system operator** accepted the cancellation.
- (3) The **system operator** must record the cancellation in the **system operator register** no later than 5 days after receiving the notice.

Compare: Electricity Governance Rules 2003 rule 8.2 section III part C

8.35 Revocation of equivalence arrangement and revocation or variation of dispensation

- (1) The **system operator** may revoke approval of an **equivalence arrangement** or revoke or vary the grant of a **dispensation** as the **system operator** reasonably considers appropriate if, at any time after the **system operator** has approved an **equivalence arrangement** or granted a **dispensation**, the **system operator** is satisfied that 1 or more of the following apply:
 - (a) the **dispensation** or **equivalence arrangement** was approved on information that was false or materially misleading;
 - (b) a prerequisite of the **dispensation** or **equivalence arrangement** has changed;
 - (c) a condition on which the **dispensation** or **equivalence arrangement** was approved has not been complied with;
 - (d) withdrawal is **provided** for under the terms of the **dispensation** granted;
 - (e) a change to this Code has occurred that affects the **dispensation** or **equivalence arrangement**;
 - (f) a decision has been reconsidered at the direction of the **Rulings Panel** under clause 8.36(4).
- (2) The **system operator** must not revoke or amend a **dispensation** or grant a further **dispensation** or revoke its approval of an **equivalence arrangement** under subclause (1), unless—
 - (a) the **asset owner** to whom the **dispensation** was granted, or for whom an **equivalence arrangement** was approved, and any other person who in the opinion of the **system operator** is likely to have an interest in the matter, is given reasonable notice of the **system operator**'s intentions and a reasonable opportunity to make submissions to the **system operator** on the issue; and
 - (b) the **system operator** has had regard to the submissions.

Compare: Electricity Governance Rules 2003 rule 8.3 section III part C

8.36 Appeal against decisions

- (1) A **participant** may appeal a decision of the **system operator** in relation to an application for **dispensation** or **equivalence arrangements** on the grounds set out in subclause (3).
- (2) An appeal must be made to the **Rulings Panel** by giving written notice to the **Authority** specifying the grounds of appeal. A notice must be given no later than 10 **business days** after publication of the relevant decision in the **system operator register** under clause 8 of Schedule 8.1.

- (3) For the purposes of subclause (2), an appeal may be made on the grounds that—
 - (a) the **system operator** made an error of fact or failed to take into account all relevant information or took into account irrelevant information and such error, failure or irrelevancy was material to the decision; or
 - (b) the conditions imposed on the **dispensation** or **equivalence arrangement** are unjustifiably onerous, unnecessary or impose extra costs if appropriate alternatives exist.
- (4) The **Rulings Panel**, in determining an appeal, must approve the decision of the **system operator** or direct the **system operator** to reconsider the decision in full or by reference to specified matters.
- (5) Pending the outcome of an appeal, the decision of the **system operator** in relation to the grant of a **dispensation** or approval of an **equivalence arrangement** remains valid and may be relied upon by the relevant **asset owner**.

Compare: Electricity Governance Rules 2003 rule 8.4 section III part C
Clause 8.36(1): amended, on 1 November 2018, by clause 13 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2018.

8.37 Other provisions relating to equivalence arrangements and dispensations

- (1) An **asset owner** who obtains approval for an **equivalence arrangement** must comply with its obligations under that arrangement.
- (1A) An **asset owner** who is granted a **dispensation** must comply with its obligations under that **dispensation**.
- (2) An **equivalence arrangement** and a **dispensation** are specific to an **asset owner**, and no approval of an **equivalence arrangement** or granting of a **dispensation** creates a precedent for the approval of other **equivalence arrangements** or **dispensations**.
- (3) The owner or operator of an **asset** or configuration of **assets** must advise the **system operator** if the owner or operator believes that it is in breach of a condition of its **dispensation** or **equivalence arrangement** or that the **asset** or configuration of **assets**, including any **equivalence arrangement**, does not, or is likely not to, comply with the **asset owner performance obligations** and **technical codes**.
- (4) If an **asset owner** fails to put in place, maintain and meet all requirements of an approved **equivalence arrangement** or **dispensation**, the **asset owner** is in breach of this Code.

Compare: Electricity Governance Rules 2003 rule 9 section III part C
Clause 8.37(1A): inserted, on 15 May 2014, by clause 9 of the Electricity Industry Participation (Minor Code Amendments) Code Amendment 2014.

8.38 Authority may require excluded generating stations to comply with certain clauses

- (1) Despite clauses 8.17, 8.19, and 8.25D, the **system operator** may, at any time, apply to the **Authority** for the **Authority** to issue a directive that an **excluded generating station asset** must comply with clauses 8.17, 8.19, 8.25A, and 8.25B, and the provisions of the **technical codes** (or parts thereof).
- (2) The **Authority** must issue the directive referred to in subclause (1) if the **Authority** is satisfied that there is a **benefit to the public** in obtaining compliance.
- (3) If a directive is issued under subclause (2), the owner of the **excluded generating station asset** must comply with the directive with effect from the date specified in the

directive.

Compare: Electricity Governance Rules 2003 rule 10 section III part C

Clause 8.38(1): amended, on 24 November 2016, by clause 8(1) and (2) of the Electricity Industry Participation Code Amendment (Generation Fault Ride Through) 2016.

Subpart 3—Arrangements concerning ancillary services

8.39 Contents of this subpart

This subpart provides for—

- (a) a **procurement plan** that the **system operator** must use reasonable endeavours to implement and comply with; and
- (b) the review of the **procurement plan**; and
- (c) **alternative ancillary service arrangements**; and
- (d) how **ancillary services** are to be priced and measured; and
- (e) identifying the **allocable costs** for **ancillary services** and the regime by which those costs are allocated to affected parties.

Compare: Electricity Governance Rules 2003 rule 1 section IV part C

Procurement plan

8.40 System operator to use reasonable endeavours to implement and comply with procurement plan

The **system operator** must use reasonable endeavours to both implement and comply with the **procurement plan**.

Compare: Electricity Governance Rules 2003 rule 2 section IV part C

8.41 *[Revoked]*

Clause 8.41: revoked, on 10 January 2013, by clause 15 of the Electricity Industry Participation (Policy Statement and Procurement Plan Review Process) Code Amendment 2012.

8.42 Incorporation of procurement plan by reference

- (1) The **procurement plan** is incorporated by reference in this Code.
- (2) Clauses 7.13 to 7.22 apply to any amendment or replacement of the **procurement plan**.

Compare: Electricity Governance Rules 2003 rule 3 section IV part C

Clause 8.42(1): amended, on 10 January 2013, by clause 16 of the Electricity Industry Participation (Policy Statement and Procurement Plan Review Process) Code Amendment 2012.

Clause 8.42(1): amended, on 1 August 2023, by clause 19(1) of the Electricity Industry Participation Code Amendment (System Operation Documents) 2023.

Clause 8.42(2): amended, on 1 August 2023, by clause 19(2) of the Electricity Industry Participation Code Amendment (System Operation Documents) 2023.

Clause 8.42(2): amended, on 1 March 2024, by clause 28 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2024.

8.42A *[Revoked]*

Clause 8.42A: inserted, on 10 January 2013, by clause 17 of the Electricity Industry Participation (Policy Statement and Procurement Plan Review Process) Code Amendment 2012.

Clause 8.42A(1): amended, on 5 October 2017, by clause 95 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 8.42A: revoked, on 1 August 2023, by clause 20 of the Electricity Industry Participation Code Amendment (System Operation Documents) 2023.

8.42B *[Revoked]*

Clause 8.42B: inserted, on 10 January 2013, by clause 17 of the Electricity Industry Participation (Policy Statement and Procurement Plan Review Process) Code Amendment 2012.

Clause 8.42B: revoked, on 1 August 2023, by clause 21 of the Electricity Industry Participation Code Amendment (System Operation Documents) 2023.

8.42C *[Revoked]*

Clause 8.42C: inserted, on 10 January 2013, by clause 17 of the Electricity Industry Participation (Policy Statement and Procurement Plan Review Process) Code Amendment 2012.

Clause 8.42C(3): amended, on 5 October 2017, by clause 96 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 8.42C: revoked, on 1 August 2023, by clause 22 of the Electricity Industry Participation Code Amendment (System Operation Documents) 2023.

8.43 Content of procurement plan

A **procurement plan** must, for each **ancillary service**—

- (a) specify the principles that the **system operator** must apply in making a **net purchase quantity assessment**, which must include—
 - (i) determining the requirements for complying with the **principal performance obligations**; and
 - (ii) determining the requirements for achieving the **dispatch objective**; and
 - (iii) assessing the contribution that compliance by **asset owners** with the **asset owner performance obligations** will make towards the **system operator's** compliance with the **principal performance obligations**; and
 - (iv) assessing the impact that **dispensations** and **alternative ancillary services arrangements** held by **asset owners** will have on the quantity of **ancillary services** required to enable the **system operator** to comply with the **principal performance obligations**; and
- (b) contain a methodology for conducting a **net purchase quantity assessment** for each relevant **ancillary service**; and
- (c) outline the process that the **system operator** must use to procure that **ancillary service**, taking into account that the **system operator** must use—
 - (i) market mechanisms to procure **ancillary services** wherever technology and transaction costs make this practicable and efficient; and
 - (ii) transparent processes that encourage all potential providers to compete to supply **ancillary services** required to meet **common quality** standards at the best economic cost; and
- (d) specify the **administrative costs** for that **ancillary service** as proposed in the **procurement plan**; and
- (e) outline the **system operator's** technical requirements and key contract terms to support the **procurement plan**; and
- (f) outline the rights and obligations of the **system operator** in relation to procurement of that **ancillary service** in circumstances not anticipated by the **procurement plan**, and if the assumptions made by the **system operator** in the **procurement plan** cannot be met; and
- (g) outline how the **system operator** will report on progress in implementing the **procurement plan**.

Compare: Electricity Governance Rules 2003 rule 4 section IV part C

Clause 8.43 Heading: amended, on 1 August 2023, by clause 23(1) of the Electricity Industry Participation Code Amendment (System Operation Documents) 2023.

Clause 8.43: substituted, on 10 January 2013, by clause 18 of the Electricity Industry Participation (Policy Statement and Procurement Plan Review Process) Code Amendment 2012.

Clause 8.43: amended, on 19 December 2014, by clause 9 of the Electricity Industry Participation Code Amendment (Minor Code Amendments) (No 3) 2014.

Clause 8.43: amended, on 1 August 2023, by clause 23(2) of the Electricity Industry Participation Code Amendment (System Operation Documents) 2023.

Clause 8.43(d): amended, on 1 August 2023, by clause 23(3) of the Electricity Industry Participation Code Amendment (System Operation Documents) 2023.

Clause 8.43(f): amended, on 1 August 2023, by clause 23(4) of the Electricity Industry Participation Code Amendment (System Operation Documents) 2023.

8.43A *[Revoked]*

Clause 8.43A: inserted, on 10 January 2013, by clause 19 of the Electricity Industry Participation (Policy Statement and Procurement Plan Review Process) Code Amendment 2012.

Clause 8.43A(3)(b): amended, on 5 October 2017, by clause 97 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 8.43A: revoked, on 1 August 2023, by clause 24 of the Electricity Industry Participation Code Amendment (System Operation Documents) 2023.

8.44 *[Revoked]*

Compare: Electricity Governance Rules 2003 rule 5 section IV part C

Clause 8.44: substituted, on 10 January 2013, by clause 20 of the Electricity Industry Participation (Policy Statement and Procurement Plan Review Process) Code Amendment 2012.

Clause 8.44(1), (4) and (6): amended, on 5 October 2017, by clause 98(1) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 8.44(2): amended, on 5 October 2017, by clause 98(2) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 8.44: revoked, on 1 August 2023, by clause 25 of the Electricity Industry Participation Code Amendment (System Operation Documents) 2023.

8.44A *[Revoked]*

Clause 8.44A: inserted, on 10 January 2013, by clause 21 of the Electricity Industry Participation (Policy Statement and Procurement Plan Review Process) Code Amendment 2012.

Clause 8.44A(4)(a) and (6): amended, on 5 October 2017, by clause 99 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 8.44A: revoked, on 1 August 2023, by clause 26 of the Electricity Industry Participation Code Amendment (System Operation Documents) 2023

8.44B *[Revoked]*

Clause 8.44B: inserted, on 10 January 2013, by clause 21 of the Electricity Industry Participation (Policy Statement and Procurement Plan Review Process) Code Amendment 2012.

Clause 8.44B(b): amended, on 5 October 2017, by clause 100 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 8.44B: revoked, on 1 August 2023, by clause 27 of the Electricity Industry Participation Code Amendment (System Operation Documents) 2023

8.45 Contracts with ancillary service agents

- (1) The **system operator** must use reasonable endeavours to implement the **procurement plan** for each **ancillary service** by entering into contracts with the **ancillary service agents** in the manner specified in the **procurement plan**.
- (2) The **system operator** is the principal in any contract it enters into with an **ancillary service agent**.
- (3) If the **system operator** has entered into a contract, the **system operator** must use reasonable endeavours to ensure that the **ancillary service agent** complies with its contractual obligations, but the **system operator** is not otherwise liable in respect of

any failure by an **ancillary service agent** to comply with such obligations.

Compare: Electricity Governance Rules 2003 rule 6 section IV part C

8.45A Methodology to assess net purchase quantity

The **system operator** must make the **net purchase quantity assessment** for each relevant **ancillary service** using the methodology in the **procurement plan** and **publish** the results of the assessment as soon as practicable.

Clause 8.45A: inserted, on 10 January 2013, by clause 22 of the Electricity Industry Participation (Policy Statement and Procurement Plan Review Process) Code Amendment 2012.

Clause 8.45A: amended, on 5 October 2017, by clause 101 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

8.46 [Revoked]

Compare: Electricity Governance Rules 2003 rule 7 section IV part C

Clause 8.46: revoked, on 10 January 2013, by clause 23 of the Electricity Industry Participation (Policy Statement and Procurement Plan Review Process) Code Amendment 2012.

8.47 Departure from procurement plan

- (1) The **system operator** may depart from the processes and arrangements set out in the **procurement plan** if the **system operator** reasonably considers it necessary to do so to comply with the **principal performance obligations**.
- (2) When the **system operator** makes a departure under subclause (1), the **system operator** must provide a report to the **Authority** setting out the circumstances of the departure and the actions taken to deal with it.
- (3) The **Authority** must **publish** the report within a reasonable time after receiving it.

Compare: Electricity Governance Rules 2003 rule 8 section IV part C

Clause 8.47(2): amended, on 10 January 2013, by clause 24(a) of the Electricity Industry Participation (Policy Statement and Procurement Plan Review Process) Code Amendment 2012.

Clause 8.47(3): inserted, on 10 January 2013, by clause 24(b) of the Electricity Industry Participation (Policy Statement and Procurement Plan Review Process) Code Amendment 2012.

Clause 8.47(3): amended, on 5 October 2017, by clause 102 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Alternative ancillary service arrangements

8.48 Alternative ancillary service arrangements

- (1) If an **asset owner** wishes to have an **alternative ancillary service arrangement** authorised by the **system operator**, that **asset owner** (or, if more than 1 **asset owner** wishes to have an authorisation, those **asset owners** jointly) may apply to the **system operator** to have that arrangement authorised as an **alternative ancillary service arrangement** using the process set out in Schedule 8.2.
- (2) The **system operator** must authorise the arrangement as an **alternative ancillary service arrangement** if—
 - (a) the proposed arrangement complies with the technical requirements for that **ancillary service** as set out in the current **procurement plan**; and
 - (b) the implementation of the proposed arrangement will make the **ancillary service** available for **dispatch** by the **system operator** in substantially the same manner as if the **ancillary service** had been procured in accordance with the **procurement plan**.

- (3) As a condition of authorising an **alternative ancillary service arrangement** under subclause (2), the **system operator** may do 1 or more of the following:
- (a) require the **asset owner** to enter into arrangements with the **system operator** to ensure that the **system operator** can continue to meet the **principal performance obligations**;
 - (b) specify the date on which the **alternative ancillary service arrangement** commences;
 - (c) impose any other condition it reasonably believes is necessary, including conditions necessary for the **system operator** to meet its **principal performance obligations** and conditions necessary for the orderly reconciliation and settlement of **ancillary services**.

Compare: Electricity Governance Rules 2003 rules 9.1 to 9.3 section IV part C

8.49 Suspension of alternative ancillary service arrangement

- (1) An **asset owner** may at any time give written reasonable notice to the **system operator** of suspension of the **alternative ancillary service arrangement** for a period specified in the notice.
- (2) The **system operator** may suspend an **alternative ancillary service arrangement** in a **system security situation**.

Compare: Electricity Governance Rules 2003 rule 9.4 section IV part C

8.50 Modification of alternative ancillary service arrangement

An **asset owner** may apply to the **system operator** for a modification to an **alternative ancillary service arrangement** in which case clauses 8.51 to 8.53 and Schedule 8.2 apply.

Compare: Electricity Governance Rules 2003 rule 9.5 section IV part C

8.51 Cancellation of alternative ancillary service arrangement

An **asset owner** may at any time give reasonable notice in writing to the **system operator** of cancellation of the **alternative ancillary service arrangement**, which comes into effect on the date specified in the notice.

Compare: Electricity Governance Rules 2003 rule 9.6 section IV part C

8.52 Revocation of alternative ancillary service arrangements

- (1) The **system operator** may revoke authorisation of the **alternative ancillary service arrangement** as the **system operator** reasonably considers appropriate, if at any time after the **system operator** has authorised an **alternative ancillary service arrangement**, the **system operator** is satisfied that 1 or more of the following factors apply:
 - (a) the **alternative ancillary service arrangement** was authorised on information that was false or materially misleading;
 - (b) a prerequisite of the **alternative ancillary service arrangement** has changed;
 - (c) a condition upon which the authorisation was granted has not been complied with;
 - (d) such revocation is provided for under the terms of the authorisation.
- (2) Subject to clause 8.49(2), the **system operator** must not revoke or amend an

alternative ancillary service arrangement unless—

- (a) the person to whom the authorisation was granted and any other person who, in the opinion of the **system operator**, is likely to have an interest in the matter, is given reasonable notice of the **system operator's** intentions and a reasonable opportunity to make submissions to the **system operator**; and
- (b) the **system operator** has had regard to those submissions.

Compare: Electricity Governance Rules 2003 rule 9.7 section IV part C

8.53 Appeal of system operator decisions

- (1) An applicant may appeal any decision of the **system operator** in relation to any **alternative ancillary service arrangement**.
- (2) A **participant** may appeal any decision of the **system operator** in relation to an **alternative ancillary service arrangement** on the grounds set out in subclause (4).
- (3) An appeal must be commenced with the **Rulings Panel** by giving written notice to the **Authority**, specifying the grounds of appeal. A notice must be given within 10 **business days** of **publication** of the decision in the **system operator register** under clause 4 of Schedule 8.2.
- (4) For the purpose of subclause (2), an appeal may be made on the grounds that—
 - (a) the **system operator** made an error of fact, or failed to take properly into account all relevant information or took into account irrelevant information, and such error, failure or irrelevancy was material to the decision; or
 - (b) the conditions imposed on the **alternative ancillary service arrangement** are onerous, unnecessary or impose extra costs if appropriate alternatives exist.
- (5) The **Rulings Panel**, in determining an appeal, must either approve the decision of the **system operator** or direct the **system operator** to reconsider the decision in full or by reference to specified matters.
- (6) Pending the outcome of an appeal, the decision of the **system operator** in relation to the authorisation of an **alternative ancillary service arrangement** remains valid and can be acted upon by the relevant **asset owner**.

Compare: Electricity Governance Rules 2003 rule 9.8 section IV part C

8.54 Other provisions relating to alternative ancillary service arrangements

- (1) The **system operator** must monitor the performance of **alternative ancillary service arrangements** in accordance with the **procurement plan** and the monitoring regimes specified in the respective **alternative ancillary service arrangements**. If the **system operator** considers, on reasonable grounds, that an **alternative ancillary service arrangement** is not being, or likely not to be, complied with, the **system operator** must immediately advise the **asset owner**.
- (2) An **asset owner** who obtains an authorisation of an **alternative ancillary service arrangement** must comply with its obligations under the arrangement. If the **system operator** advises an **asset owner** under subclause (1), the **asset owner** must co-operate with the **system operator** and must immediately use reasonable endeavours to restore compliance as soon as possible.
- (3) An **asset owner** who holds an **alternative ancillary service arrangement** is relieved of

an obligation to pay costs for **ancillary service** in the manner provided for in clauses 8.55 to 8.59 and 8.64 to 8.70 to the extent provided for in the **alternative ancillary service arrangement**.

- (4) The holder of an **alternative ancillary service arrangement** breaches this Code if **ancillary services** are not made available to the **system operator** in accordance with the **alternative ancillary service arrangement**, or if an **alternative ancillary service arrangement** fails. From the date a breach of an **alternative ancillary service arrangement** becomes known, the holder of the **alternative ancillary service arrangement** must meet its share of the ancillary costs as if the **alternative ancillary service arrangement** had not been authorised.

Compare: Electricity Governance Rules 2003 rule 10 section IV part C

Clause 8.54(2): amended, on 1 November 2018, by clause 14 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2018.

Subpart 4—Interruptible load

Heading: inserted, on 7 August 2014, by clause 9 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

8.54A Contents of this subpart

This subpart provides for the provision of information relating to **interruptible load**.

Clause 8.54A: inserted, on 7 August 2014, by clause 9 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

8.54AA System operator to maintain and publish register

- (1) The **system operator** must maintain and **publish** an up to date copy of the **system operator register**.
- (2) The up to date copy of the **system operator register published** under subclause (1) must be available to the public at all times up until a new up to date copy is **published**.

Clause 8.54AA: inserted, on 20 December 2021, by clause 11 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2019.

8.54B Ancillary service agents to provide information about interruptible load

- (1) Each **ancillary service agent** that contracts for **interruptible load** in a **network** must, within 10 **business days** of entering into the contract, give the following **participants** the information in subclause (2):
- (a) if the **interruptible load** is contracted on a **local network**, the **connected asset owner** that operates the **local network**;
 - (b) if the **interruptible load** is contracted on an **embedded network**, the **connected asset owner** that operates the **local network** to which the **embedded network** is **connected**;
 - (c) if the **interruptible load** is contracted on the **grid**, the **grid owner** that owns or operates the part of the **grid** on which the **interruptible load** is contracted.
- (2) The information required is—
- (a) a list of the **ICPs** to which the contract relates; and
 - (b) the maximum **MW** that can be interrupted under the contract; and
 - (c) the commencement and expiry dates of the contract.

- (3) If an **ancillary service agent** has given a **connected asset owner** or **grid owner** information under subclause (1), the **connected asset owner** or **grid owner** may require the **ancillary service agent** to provide further information about the **interruptible load** to which the contract relates.
- (4) An **ancillary service agent** must comply with a requirement under subclause (3).
Clause 8.54B: inserted, on 7 August 2014, by clause 9 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.
Clause 8.54B(1)(b): amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.
Clause 8.54B(1) and (3): amended, on 1 February 2016, by clause 11 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Subpart 5—*[Revoked]*

Heading: inserted, on 7 August 2014, by clause 9 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Heading: revoked, on 21 December 2021, by clause 12 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

8.54C *[Revoked]*

Clause 8.54C: inserted, on 7 August 2014, by clause 9 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Clause 8.54C: revoked, on 21 December 2021, by clause 12 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

8.54D *[Revoked]*

Clause 8.54D: inserted, on 7 August 2014, by clause 9 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Clause 8.54D: revoked, on 21 December 2021, by clause 12 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

8.54E *[Revoked]*

Clause 8.54E: inserted, on 7 August 2014, by clause 9 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Clause 8.54E(2): amended, on 19 December 2014, by clause 10 of the Electricity Industry Participation Code Amendment (Minor Code Amendments) (No 3) 2014.

Clause 8.54E: revoked, on 21 December 2021, by clause 12 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

8.54F *[Revoked]*

Clause 8.54F: inserted, on 7 August 2014, by clause 9 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Clause 8.54F(3): amended, on 5 October 2017, by clause 103 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 8.54F: revoked, on 21 December 2021, by clause 12 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

8.54G *[Revoked]*

Clause 8.54G: inserted, on 7 August 2014, by clause 9 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Clause 8.54G(3)(g): amended, on 5 October 2017, by clause 104(1) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 8.54G(3)(h): revoked, on 5 October 2017, by clause 104(2) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 8.54G(3A): inserted, on 5 October 2017, by clause 104(3) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

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Clause 8.54G: revoked, on 21 December 2021, by clause 12 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

8.54H *[Revoked]*

Clause 8.54H: inserted, on 7 August 2014, by clause 9 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Clause 8.54H: revoked, on 21 December 2021, by clause 12 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

8.54I *[Revoked]*

Clause 8.54I: inserted, on 7 August 2014, by clause 9 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Clause 8.54I: revoked, on 21 December 2021, by clause 12 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

8.54J *[Revoked]*

Clause 8.54J: inserted, on 7 August 2014, by clause 9 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Clause 8.54J(2): amended, on 19 December 2014, by clause 11 of the Electricity Industry Participation Code Amendment (Minor Code Amendments) (No 3) 2014.

Clause 8.54J(12): inserted, on 19 January 2017, by clause 6 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2016.

Clause 8.54J: revoked, on 21 December 2021, by clause 12 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

8.54K *[Revoked]*

Clause 8.54K: inserted, on 7 August 2014, by clause 9 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Clause 8.54K(1): amended, on 19 January 2017, by clause 7(1) of the Electricity Industry Participation Code Amendment (Extended Reserve) 2016.

Clause 8.54K(2): replaced, on 19 January 2017, by clause 7(2) of the Electricity Industry Participation Code Amendment (Extended Reserve) 2016.

Clause 8.54K: revoked, on 21 December 2021, by clause 12 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

8.54L *[Revoked]*

Clause 8.54L: inserted, on 7 August 2014, by clause 9 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Clause 8.54L: revoked, on 21 December 2021, by clause 12 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

8.54M *[Revoked]*

Clause 8.54M: inserted, on 7 August 2014, by clause 9 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Clause 8.54M: revoked, on 21 December 2021, by clause 12 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

8.54N *[Revoked]*

Clause 8.54N: inserted, on 7 August 2014, by clause 9 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Clause 8.54N: amended, on 19 January 2017, by clause 8 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2016.

Clause 8.54N: revoked, on 21 December 2021, by clause 12 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

8.54O *[Revoked]*

Clause 8.54O: inserted, on 7 August 2014, by clause 9 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Clause 8.54O(3)(c): amended, on 19 January 2017, by clause 9(1) of the Electricity Industry Participation Code Amendment (Extended Reserve) 2016.

Clause 8.54O(5): inserted, on 19 January 2017, by clause 9(2) of the Electricity Industry Participation Code Amendment (Extended Reserve) 2016.

Clause 8.54O: revoked, on 21 December 2021, by clause 12 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

8.54P *[Revoked]*

Clause 8.54P: inserted, on 7 August 2014, by clause 9 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Clause 8.54P: revoked, on 21 December 2021, by clause 12 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

8.54Q *[Revoked]*

Clause 8.54Q: inserted, on 7 August 2014, by clause 9 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Clause 8.54Q heading: amended, on 19 December 2014, by clause 12(1) of the Electricity Industry Participation Code Amendment (Minor Code Amendments) (No 3) 2014.

Clause 8.54Q heading: amended, on 19 January 2017, by clause 10(1) of the Electricity Industry Participation Code Amendment (Extended Reserve) 2016.

Clause 8.54Q heading: amended, on 5 October 2017, by clause 105(1) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 8.54Q(1) and (2)(b): amended, on 19 December 2014, by clause 12(2) of the Electricity Industry Participation Code Amendment (Minor Code Amendments) (No 3) 2014.

Clause 8.54Q(1) and (2)(b): amended, on 19 January 2017, by clause 10(2) of the Electricity Industry Participation Code Amendment (Extended Reserve) 2016.

Clause 8.54Q(1) and (2)(b): amended, on 5 October 2017, by clause 105(2) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 8.54Q: revoked, on 21 December 2021, by clause 12 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

8.54R *[Revoked]*

Clause 8.54R: inserted, on 7 August 2014, by clause 9 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Clause 8.54R heading: amended, on 19 December 2014, by clause 13 of the Electricity Industry Participation Code Amendment (Minor Code Amendments) (No 3) 2014.

Clause 8.54R: revoked, on 21 December 2021, by clause 12 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

8.54S *[Revoked]*

Clause 8.54S: inserted, on 7 August 2014, by clause 9 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Clause 8.54S Heading: amended, on 1 February 2016, by clause 12(1) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Clause 8.54S(1) & (2): amended, on 1 February 2016, by clause 12(2) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Clause 8.54S: revoked, on 21 December 2021, by clause 12 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

8.54T *[Revoked]*

Clause 8.54T: inserted, on 7 August 2014, by clause 9 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Clause 8.54T(4): amended, on 19 December 2014, by clause 14 of the Electricity Industry Participation Code Amendment (Minor Code Amendments) (No 3) 2014.

Clause 8.54T(4): amended, on 5 October 2017, by clause 106 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 8.54T: revoked, on 21 December 2021, by clause 12 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

8.54TA *[Revoked]*

Clause 8.54TA: inserted, on 19 January 2017, by clause 11 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2016.

Clause 8.54TA: revoked, on 21 December 2021, by clause 12 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

8.54TB *[Revoked]*

Clause 8.54TB: inserted, on 19 January 2017, by clause 11 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2016.

Clause 8.54TB: revoked, on 21 December 2021, by clause 12 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

8.54TC *[Revoked]*

Clause 8.54TC: inserted, on 19 January 2017, by clause 11 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2016.

Clause 8.54TC: revoked, on 21 December 2021, by clause 12 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

8.54TD *[Revoked]*

Clause 8.54TD: inserted, on 19 January 2017, by clause 11 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2016.

Clause 8.54TD: revoked, on 21 December 2021, by clause 12 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

8.54TE *[Revoked]*

Clause 8.54TE: inserted, on 5 October 2017, by clause 107 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 8.54TE: revoked, on 21 December 2021, by clause 12 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

8.54TF *[Revoked]*

Clause 8.54TF: inserted, on 5 October 2017, by clause 107 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 8.54TF: revoked, on 21 December 2021, by clause 12 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

Subpart 6—Allocating costs

Heading: inserted, on 24 March 2015, by clause 10 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

8.54U Contents of this subpart

This subpart provides for the allocation of costs relating to **ancillary services**.

Clause 8.54U: inserted, on 24 March 2015, by clause 10 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Clause 8.54U: amended, on 21 December 2021, by clause 13 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

Allocating costs for ancillary services

Cross heading: amended, on 24 March 2015, by clause 11 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Cross heading: amended, on 21 December 2021, by clause 14 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

8.55 Identifying costs associated with ancillary services

(1) The **allocable costs** for each **ancillary service** are—

- (a) the actual amounts that the **ancillary service agents** are entitled to receive for that **ancillary service** under contracts entered into by the **system operator** in implementing the **procurement plan**; plus
- (b) the actual **administrative costs** of the **system operator** (as approved by the **Authority**) incurred in administering the **procurement plan** in respect of that **ancillary service**; less
- (c) any readily identifiable and quantifiable costs to be paid by **asset owners** in respect of that **ancillary service** as a condition of any **dispensations** stipulated in accordance with clause 8.31(1)(a); less
- (d) any identifiable costs to be paid by any person in respect of that **ancillary service**, as a condition of any agreement reached by the **system operator**, in accordance with clause 8.6.

(2) *[Revoked]*

Compare: Electricity Governance Rules 2003 rule 11.1 section IV part C
Clause 8.55 heading: amended, on 24 March 2015, by clause 12(1) of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.
Clause 8.55 heading: amended, on 21 December 2021, by clause 15(1) of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.
Clause 8.55(2): inserted, on 24 March 2015, by clause 12(2) of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.
Clause 8.55(2): revoked, on 21 December 2021, by clause 15(2) of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

8.56 Black start costs allocated to grid owner

The **allocable cost** of **black start** must be paid by the **registered participants** who are **grid owners** to the **system operator** in accordance with the process described in clause 8.68. If there are multiple **grid owners**, those costs must be allocated between them in proportion to their respective ODV valuations.

Compare: Electricity Governance Rules 2003 rule 11.2 section IV part C

8.57 Over frequency reserve costs allocated to HVDC owner

The **allocable cost** of **over frequency reserve** must be paid by the **HVDC owner** to the **system operator** in accordance with the process described in clause 8.68.

Compare: Electricity Governance Rules 2003 rule 11.3 section IV part C

8.58 Frequency keeping costs are allocated to purchasers

The **allocable cost** of **frequency keeping** must be paid by **purchasers** to the **system operator** in accordance with the process in clause 8.68. Those costs must be calculated in accordance with the following formula:

$$\text{Share}_{\text{PUR}_x} = \frac{F_c * \max(0, \sum_t (\text{Offtake}_{\text{PUR}_{xt}} - E_{\text{PUR}_{xt}}^{\text{FK}}))}{\sum_x \max(0, \sum_t (\text{Offtake}_{\text{PUR}_{xt}} - E_{\text{PUR}_{xt}}^{\text{FK}}))}$$

where

$\text{Share}_{\text{PUR}_x}$ is **purchaser x's share of allocable cost** in relation to **frequency keeping**

F_c is the **allocable cost of frequency keeping services** in the **billing period**

$Offtake_{PURxt}$ is the total **reconciled quantity** in **kWh** for **purchaser x** across all **grid exit points** in **trading period t** in the **billing period**

E_{PURxt}^{FK} is the quantity of any **frequency keeping** provided under any **alternative ancillary service arrangement** for **frequency keeping** authorised by the **system operator** for **purchaser x** in **trading period t**.

Compare: Electricity Governance Rules 2003 rule 11.4 section IV part C

8.59 Availability costs allocated to generators and HVDC owner

The **availability costs** in a **billing period** must be allocated separately to persons in the North Island and South Island in accordance with the following formula:

$$Share_t = \frac{Ac_t * m_t}{M_t}$$

where

$Share_t$ is the **availability cost** allocated to a **generator** who owns **generating unit x** or to the **HVDC link** for **trading period t** for the North Island or South Island as appropriate

Ac_t is the **availability cost** for the North Island or South Island as appropriate incurred in respect of **trading period t**

m_t $\left\{ \begin{array}{l} \text{is } \max(0, INJ_{GENxt} - (h * INJ_D) - E_{GENxt}^{IR}) = m_{xt} \text{ for any } \mathbf{generating unit} \\ \text{is } \max(0, HVDC_{Riskt} - (h * INJ_D) - E_{HVDCt}^{IR}) = m_{ht} \text{ for the } \mathbf{HVDC link} \end{array} \right.$

M_t is $\sum_x m_{xt} + m_{ht}$

h is 0.5 **MWh/MW**

INJ_{GENxt} is the **electricity injected** (expressed in **MWh**) by **generating unit x** in **trading period t** into the North Island or South Island as appropriate

E_{GENxt}^{IR} is the quantity of any **instantaneous reserve** provided under any **alternative ancillary service arrangements** for **instantaneous reserve** authorised by the **system operator** for **generating unit x** in **trading period t**

$HVDC_{Riskt}$ is the **at risk HVDC transfer** (expressed in **MWh**) in **trading period t** into the North Island or South Island as appropriate

E_{HVDCt}^{IR} is the quantity of any **instantaneous reserve** provided under any **alternative ancillary service arrangement** for **instantaneous reserve** authorised by the **system operator** for **at risk HVDC transfer** in **trading period t**

INJ_D is 60 **MW**.

Compare: Electricity Governance Rules 2003 rule 11.5.1 section IV part C

8.60 System operator must investigate causer of under-frequency event

- (1) The **system operator** must promptly advise the **Authority**, every **generator**, **grid owner** and any other **participant** substantially affected by an **under-frequency event**, that an **under-frequency event** has occurred.
- (2) The **system operator** may, by notice in writing to a **participant**, require a **participant** to provide information required by the **system operator** for the purposes of this clause.
- (3) A notice given under subclause (2) must specify the information required by the **system operator** and the date by which the information must be provided (which must not be earlier than 20 **business days** after the notice is given).
- (4) A **participant** who has received a notice under subclause (2) must provide the information required by the **system operator** by the date specified by the **system operator** in the notice.
- (5) Within 40 **business days** of receiving the information, or such longer period as may be agreed by the **Authority**, the **system operator** must provide a report to the **Authority** that includes the following:
 - (a) whether, in the **system operator's** view, the **under-frequency event** was caused by a **generator** or **grid owner**, and if so, the identity of the **causer**;
 - (b) the reasons for the **system operator's** view;
 - (c) all of the information the **system operator** considered in reaching its view.

Compare: Electricity Governance Rules 2003 rule 11.5.1A section IV part C

Clause 8.60 Heading: amended, on 19 May 2016, by clause 25(1) of the Electricity Industry Participation Code Amendment (System Operator and Alignment with Statutory Objective) 2016.

Clause 8.60(1): amended, on 19 May 2016, by clause 25(2) of the Electricity Industry Participation Code Amendment (System Operator and Alignment with Statutory Objective) 2016.

Clause 8.60(1): amended, on 1 November 2018, by clause 15 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2018.

Clause 8.60(2): amended, on 19 May 2016, by clause 25(3)(a), (b) and (c) of the Electricity Industry Participation Code Amendment (System Operator and Alignment with Statutory Objective) 2016.

Clause 8.60(3): amended, on 19 May 2016, by clause 25(4)(a) and (b) of the Electricity Industry Participation Code Amendment (System Operator and Alignment with Statutory Objective) 2016.

Clause 8.60(5): inserted, on 19 May 2016, by clause 25(5) of the Electricity Industry Participation Code Amendment (System Operator and Alignment with Statutory Objective) 2016.

8.61 Authority to determine causer of under-frequency event

- (1) The **Authority** must determine whether an **under-frequency event** has been caused by a **generator** or **grid owner** and, if so, the identity of the **causer**.
- (2) The **Authority** must **publish** a draft determination that states whether the **under-frequency event** was caused by a **generator** or **grid owner** and, if so, the identity of the **causer**.
- (3) The **Authority** must give reasons for its findings in the draft determination.
- (4) The **Authority** must consult every **generator**, **grid owner** and other **participant** substantially affected by an **under-frequency event** in relation to the draft determination.
- (5) When the **Authority publishes** the draft determination under subclause (2), the **Authority** must give notice to **generators**, **grid owners**, and other **participants** substantially affected by the **under-frequency event** of the closing date for submissions on the draft determination.

- (6) The date referred to in subclause (5) must be no earlier than 10 **business days** after the date of **publication** of the draft determination.
- (7) The **Authority** must **publish** submissions received under subclause (4) unless there is good reason for withholding information in a submission.
- (8) For the purposes of subclause (7), good reason for withholding information exists if there is good reason for withholding the information under the Official Information Act 1982.
- (9) Following the consultation under subclause (4), the **Authority** must **publish** a final determination.

Compare: Electricity Governance Rules 2003 rule 11.5.1B section IV part C

Clause 8.61 Heading: amended, on 19 May 2016, by clause 26(1) of the Electricity Industry Participation Code Amendment (System Operator and Alignment with Statutory Objective) 2016.

Clause 8.61: amended, on 19 May 2016, by clause 26(2) of the Electricity Industry Participation Code Amendment (System Operator and Alignment with Statutory Objective) 2016.

Clause 8.61(1): amended, on 19 May 2016, by clause 26(3) of the Electricity Industry Participation Code Amendment (System Operator and Alignment with Statutory Objective) 2016.

Clause 8.61(5): amended, on 19 May 2016, by clause 26(4)(a) and (b) of the Electricity Industry Participation Code Amendment (System Operator and Alignment with Statutory Objective) 2016.

8.62 Disputes regarding Authority determinations

- (1) A **participant** who is substantially affected by a determination may dispute the determination by referring the matter to the **Rulings Panel**.
- (2) A dispute is commenced by giving written notice to the **Rulings Panel** specifying the grounds of the dispute.
- (3) A notice under subclause (2) must be given within 10 **business days** after the determination is **published**.
- (4) The **Authority's** determination is suspended if a dispute is referred to the **Rulings Panel** within that time.
- (5) If a dispute is not referred to the **Rulings Panel** within that time, the determination is final.
- (6) If a dispute is referred to the **Rulings Panel**, the **Authority** must provide the **Rulings Panel** with all information considered by the **Authority** in making the determination.

Compare: Electricity Governance Rules 2003 rule 11.5.1C section IV part C

Clause 8.62 Heading: amended, on 19 May 2016, by clause 27(1) of the Electricity Industry Participation Code Amendment (System Operator and Alignment with Statutory Objective) 2016.

Clause 8.62(1): amended, on 19 May 2016, by clause 27(2) of the Electricity Industry Participation Code Amendment (System Operator and Alignment with Statutory Objective) 2016.

Clause 8.62(3): amended, on 5 October 2017, by clause 108 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 8.62 (4): amended, on 19 May 2016, by clause 27(3) of the Electricity Industry Participation Code Amendment (System Operator and Alignment with Statutory Objective) 2016.

Clause 8.62(6): amended, on 19 May 2016, by clause 27(4) of the Electricity Industry Participation Code Amendment (System Operator and Alignment with Statutory Objective) 2016.

8.63 Decision of the Rulings Panel

- (1) The **Rulings Panel** may—
 - (a) confirm the determination; or
 - (b) amend the determination; or
 - (c) substitute its own determination; or
 - (d) refer the determination back to the **Authority** with directions as to the particular matters that require reconsideration or amendment.

- (2) The **Authority's** determination has effect as confirmed, amended, or substituted by the **Rulings Panel** from the date of the **Rulings Panel's** decision.
- (3) The **Rulings Panel** must give a copy of its decision to the **Authority** as soon as reasonably practicable.
- (4) The **Authority** must **publish** the **Rulings Panel's** decision as soon as reasonably practicable.
- (5) If the **Rulings Panel** refers the matter back to the **Authority**, the **Authority** must have regard to the **Rulings Panel's** directions under subclause (1)(d).

Compare: Electricity Governance Rules 2003 rule 11.5.1D section IV part C

Clause 8.63: amended, on 19 May 2016, by clause 28(1) of the Electricity Industry Participation Code Amendment (System Operator and Alignment with Statutory Objective) 2016.

Clause 8.63(3): amended, on 19 May 2016, by clause 28(2) of the Electricity Industry Participation Code Amendment (System Operator and Alignment with Statutory Objective) 2016.

8.64 Event costs allocated to event causers

The **event charge** payable by the **causer** of an **under-frequency event** (referred to as "Event e" below) must be calculated in accordance with the following formula:

$$EC = ECR * (\sum_y (INT_{ye} \text{ for all } y) - INJ_D)$$

where

EC is the **event charge** payable by the **causer**

ECR is \$1,250 per **MW**

INJ_D is 60 **MW**

INT_{ye} is the electric power (expressed in **MW**) lost at point y by reason of Event e (being the net reduction in the **injection of electricity** (expressed in **MW**) experienced at point y by reason of Event e) excluding any loss at point y by reason of secondary Event e

y is a **point of connection** or the **HVDC injection point** at which the **injection of electricity** was interrupted or reduced by reason of Event e.

Compare: Electricity Governance Rules 2003 rule 11.5.2 section IV part C

Clause 8.64: amended, on 21 September 2012, by clause 10 of the Electricity Industry Participation (Minor Amendments) Code Amendment 2012.

8.65 Rebates paid for under-frequency events

An **event charge** that has been paid for an **under-frequency event** (referred to as "Event e") under clause 8.64 must be rebated in accordance with the following formula to persons who are allocated **availability costs** in accordance with clause 8.59:

$$\text{Rebate}_{xe} = EC_e * Z_{xe}/Z_{tote}$$

where

Rebate_{xe} is the rebate of the **event charge** paid for Event e to person "x", who

has been allocated **availability costs** in accordance with clause 8.59

EC_e is the **event charge** paid for Event e

Z_{xe} is the sum of all **availability costs** paid by x during the **billing period** in which Event e occurred and the 2 preceding **billing periods**

Z_{tote} is the sum of all **availability costs** paid for all **trading periods** during the **billing period** in which Event e occurred and the two preceding **billing periods**.

Compare: Electricity Governance Rules 2003 rule 11.5.3 section IV part C

8.66 Payments and rebates

All costs calculated in accordance with clauses 8.59 and 8.64 are payable by the relevant **participants** to the **system operator**, and all **event charge** rebates calculated in accordance with clause 8.65 are payable by the **system operator** to the relevant **participants**, in accordance with clause 8.69.

Compare: Electricity Governance Rules 2003 rule 11.5.4 section IV part C

8.67 Voltage support costs allocated in 3 parts – nominated peak, monthly peak and residual charges

- (1) Each **connected asset owner** must pay the **allocable cost of voltage support** in each **zone** to the **system operator** in accordance with clause 8.68. The costs must be calculated in accordance with this clause.
- (2) Each **connected asset owner** must pay a nominated peak kvar charge calculated in accordance with the following formula:

$$\text{NomCharge}_{xz} = \text{PeakRate}_z * \sum_j Q_{xjz}$$

where

NomCharge_{xz} is the total nominated peak charges for **connected asset owner x** in **zone z**

Peak Rate_z is the fixed \$/kvar set annually in advance by **system operator** for **zone z**

Q_{xjz} is $\text{Nom Peak}_{\text{LINES}_{xjz}}$, which is the peak demand in kvar (in **zone z**) nominated to the **system operator** in advance of, and having effect from, 1 March each year by **connected asset owner x** at its **connected asset owner kvar reference node j**

\sum_j is the sum across all **connected asset owner kvar reference nodes j** of **connected asset owner x** in **zone z**

- (3) Each **connected asset owner** must pay a monthly peak penalty charge calculated in accordance with the following formula:

$$\text{PeakPenaltyCharge}_{\text{LINE}_{xz}} = \text{PenaltyRate}_z * \sum_j \text{PenaltyQuantity}_{\text{LINE}_{xjz}}$$

where

$\text{PeakPenaltyCharge}_{\text{LINE}_{xz}}$ is the total peak penalty charges for **connected asset owner x** across all **connected asset owner kvar reference nodes j** for **connected asset owner x** in **zone z**

PenaltyRate_z is the fixed \$/kvar penalty charge for “kvar above nominated kvar” set annually in advance by the **system operator** in **zone z**

\sum_j is the sum across all **connected asset owner kvar reference nodes j** of **connected asset owner x** in **zone z**

$\text{PenaltyQuantity}_{\text{LINE}_{xjz}}$ is the “kvar above nominated kvar” quantity for **connected asset owner x** at its **connected asset owner kvar reference node j** in **zone z**

- (4) For the purpose of calculating the “kvar above nominated kvar” quantity, the kvar taken by the **connected asset owner**—
- (a) includes only kvar demands on weekdays (Monday to Friday but excluding **national holidays**) between the hours of 0700 to 2100 inclusive; and
 - (b) includes no more than 2 kvar peaks in any 1 day; and
 - (c) is the average of the 6 largest kvar peaks for the **connected asset owner** in each month measured at the **connected asset owner kvar reference node j** within the **zone z**,—

and “kvar above nominated kvar” is the difference between the kvar taken by the **connected asset owners** as determined in accordance with paragraphs (a) to (c) and the nominated kvar specified by the **connected asset owner**.

- (5) Each **connected asset owner** must pay a residual charge or receive a residual payment calculated in accordance with the following formulae:

$$\text{Residual}_{\text{ALL}z} = \text{Vcost}_z - \text{Nom Charge}_{\text{ALL}z} - \text{PeakPenaltyCharge}_{\text{ALL}z}$$

$$\text{Residual}_{\text{LINE}_{all}z} = \text{Residual}_{\text{ALL}z} * (\sum_{xj} \text{NomPeak}_{\text{LINE}_{xjz}} / \sum_{xj} Q_{xjz})$$

$$\text{Residual}_{\text{LINE}_{xz}} = \text{Residual}_{\text{LINE}_{all}z} * (\text{BillingPeriodOfftake}_{\text{LINE}_{xz}} / \text{BillingPeriodOfftake}_{\text{ALL}z})$$

where

Vcost_z is the total **allocable costs** for **voltage support** in **zone z** in the **billing period**

$\text{Nom Charge}_{\text{ALL}z}$ is the sum of all Nom Charge_{xz} for **zone z**

PeakPenaltyCharge _{ALLz}	is the sum of all connected asset owners' PeakPenaltyCharge _{LINExz} for zone z
Residual _{ALLz}	is the total residual to be recovered from or paid to connected asset owners in zone z
Residual _{LINeallz}	is the portion of Residual _{ALLz} to be recovered from or paid to connected asset owners in zone z
Residual _{LINExz}	is the portion of Residual _{LINeallz} to be recovered from or paid to connected asset owner x in zone z
BillingPeriodOfftake _{LINExz}	is the sum of metering information for connected asset owner x across all connected asset owner kvar reference nodes in zone z for the billing period for all trading periods
BillingPeriodOfftake _{ALLz}	is the sum of metering information for all connected asset owners across all connected asset owner kvar reference nodes in zone z for the billing period for all trading periods
Σ_{xj}	is the sum across all connected asset owner kvar reference nodes j for all connected asset owners x in zone z
Σ_j	is the sum across all connected asset owner kvar reference nodes j of connected asset owner x in zone z
Q_{xjz}	is Nom Peak _{LINExjz} , which is the peak demand in kvar (in zone z) nominated to the system operator in advance of, and having effect from, 1 March each year by connected asset owner x at its connected asset owner kvar reference node j

- (6) For the purposes of this clause, a **connected asset owner** does not include a **generator** who is supplied **electricity** for consumption at a **point of connection** with the **grid**.

Compare: Electricity Governance Rules 2003 rule 11.6 section IV part C

Clause 8.67: amended, on 1 February 2016, by clause 13 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Clause 8.67(5): amended, on 15 May 2014, by clause 10 of the Electricity Industry Participation (Minor Code Amendments) Code Amendment 2014.

8.67A [Revoked]

Clause 8.67A: inserted, on 24 March 2015, by clause 13 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Clause 8.67A Heading: amended, on 1 February 2016, by clause 14(1) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Clause 8.67A: amended, on 1 February 2016, by clause 14(2) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Clause 8.67A: amended, on 19 January 2017, by clause 12 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2016.

Clause 8.67A: revoked, on 21 December 2021, by clause 16 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

8.68 Clearing manager to determine amounts owing

- (1) The **clearing manager** must determine the amount owing to the **system operator** by each **grid owner, purchaser, generator and connected asset owner** for **ancillary services** under clauses 8.55 to 8.67. On behalf of the **system operator**, the **clearing manager** must collect those amounts, and any amounts advised by the **system operator** as owing to it under clauses 8.6 and 8.31(1)(a), by including the relevant amounts in the amounts advised by the **clearing manager** as owing under Part 14.
- (2) To enable the **clearing manager** to determine those amounts, the **system operator** must provide to the **clearing manager** the total **allocable cost** for each **ancillary service** and any additional information required to carry out the calculations under clauses 8.55 to 8.67 that is not otherwise provided by the **reconciliation manager** under Part 13.
- (3) *[Revoked]*
- (4) *[Revoked]*
- (5) *[Revoked]*
- (6) All amounts owing under this clause are subject to the priority order of payments set out in clause 14.56.

Compare: Electricity Governance Rules 2003 rule 11.7 section IV part C

Clause 8.68 heading: amended, on 24 March 2015, by clause 7(1) of the Electricity Industry Participation (Settlement and Prudential Security) Code Amendment 2013.

Clause 8.68(1): amended, on 24 March 2015, by clause 7(2) of the Electricity Industry Participation (Settlement and Prudential Security) Code Amendment 2013.

Clause 8.68(1): amended, on 24 March 2015, by clause 14(1) of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Clause 8.68(1): amended, on 1 February 2016, by clause 15 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Clause 8.68(3), (4), (5) and (6): inserted, on 24 March 2015, by clause 14(2) of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Clause 8.68(3): amended, on 1 February 2016, by clause 15 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Clause 8.68(3): amended, on 19 January 2017, by clause 13 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2016.

Clause 8.68(3), (4) and (5): revoked, on 21 December 2021, by clause 17 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

Clause 8.68(2): amended, on 1 November 2022, by clause 6 of the Electricity Industry Participation Code Amendment (Real Time Pricing) 2022.

8.69 Clearing manager to determine wash up amounts payable and receivable

- (1) The **clearing manager** must determine the following amounts owing as a result of **washups** under subpart 6 of Part 14:
 - (a) the amount owing to the **system operator** by each **grid owner, purchaser, generator and connected asset owner** for **ancillary services** under clauses 8.55 to 8.67:
 - (b) the amount owing to each **grid owner, purchaser, generator and connected asset owner** by the **system operator** for **ancillary services** under clauses 8.55 to 8.67:
 - (c) *[Revoked]*:
 - (d) *[Revoked]*.
- (2) On behalf of the **system operator** the **clearing manager** must collect or pay the

amounts owing for **ancillary services**, and any amounts advised by the **system operator** as payable to it under clauses 8.6 and 8.31(1)(a) by including the relevant amounts advised by the **clearing manager** as owing under Part 14.

- (3) To enable the **clearing manager** to determine the amounts payable for **ancillary services**, the **system operator** must provide to the **clearing manager** the **allocable cost** for each **ancillary service** and any additional information required to carry out the recalculations under clauses 8.55 to 8.67 that is not otherwise provided by the **reconciliation manager** under Part 13.
- (4) All amounts owing under this clause are subject to the priority order of payments set out in clause 14.56.

Compare: Electricity Governance Rules 2003 rule 11.8 section IV part C

Clause 8.69 heading: amended, on 24 March 2015, by clause 8(1) of the Electricity Industry Participation (Settlement and Prudential Security) Code Amendment 2013.

Clause 8.69: substituted, on 24 March 2015, by clause 15 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Clause 8.69(1): amended, on 24 March 2015, by clause 8(2) of the Electricity Industry Participation (Settlement and Prudential Security) Code Amendment 2013.

Clause 8.69(1)(a) & (b): amended, on 1 February 2016, by clause 16(1) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Clause 8.69(1)(c) and (d): revoked, on 21 December 2021, by clause 18 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

Clause 8.69(4): amended, on 1 February 2016, by clause 16(2) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Clause 8.69(3): amended, on 1 November 2022, by clause 7 of the Electricity Industry Participation Code Amendment (Real Time Pricing) 2022.

8.70 System operator pays ancillary service agents

- (1) The **system operator** must pay each **ancillary service agent** the amounts that each **ancillary service agent** is entitled to receive for **ancillary services** under contracts entered into by the **system operator** in implementing the **procurement plan**.
- (2) The **system operator** must use the **clearing manager** as its agent to pay **participants**.

Compare: Electricity Governance Rules 2003 rule 11.9 section IV part C

Schedule 8.1

cls 8.29 and 8.33

Approval of equivalence arrangement or grant of dispensation

1 Contents of this Schedule

This Schedule sets out the process for an **asset owner** who wishes to apply for—

- (a) approval of an **equivalence arrangement**; or
- (b) the grant of a **dispensation**.

Compare: Electricity Governance Rules 2003 clause 1 schedule C1 part C

2 Application and supporting information

Each application for an **equivalence arrangement** or a **dispensation** must—

- (a) be in writing; and
- (b) specify the **AOPO** or **technical code** from which approval for an **equivalence arrangement** or the grant of **dispensation** is sought; and
- (c) provide supporting information for the application, including sufficient information about the actual capability of the **asset** or configuration of **assets**; and
- (d) describe any remedial action planned to return the **asset** or configuration of **assets** to a compliant state; and
- (e) specify the required term of the **equivalence arrangement** or **dispensation**; and
- (f) indicate any information for which confidentiality is sought on the grounds that it would, if disclosed, unreasonably prejudice the commercial position of the person who supplied the information (or of the person who is the subject of that information), or would disclose a trade secret, or on the ground that it is necessary to protect information which is itself subject to an obligation of confidence, and the duration of the requirement for confidentiality.

Compare: Electricity Governance Rules 2003 clause 2 schedule C1 part C

3 System operator obligations on receipt of application

No later than **5 business days** after receiving the application made under clause 2, the **system operator** must—

- (a) record the name of the **asset owner** making the application, the date and the subject matter of the application in the **system operator register**; and
- (b) give written notice to the **Authority** of the application; and
- (c) provide the **asset owner** with an estimate of the likely time that it will take to consider the application and the likely costs associated with processing the application.

Compare: Electricity Governance Rules 2003 clause 3 schedule C1 part C

Clause 3: amended, on 20 December 2021, by clause 12 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2019.

Clause 3(b): amended, on 5 October 2017, by clause 109 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

4 Rights and obligations while processing applications

- (1) The **system operator** must use reasonable endeavours to process an application for approval of an **equivalence arrangement** or grant of a **dispensation** within the

- timeframe and costs estimated in accordance with clause 3(c).
- (2) If the **system operator** cannot process the application within the timeframe or costs originally estimated, it must give notice of this fact and its amended estimates of timeframe or costs to the **asset owner**, and clause 5 applies in respect of those costs.
 - (3) The **system operator** may require the provision of additional information at any stage during the application process and, provided the **system operator's** requirements are reasonable, that information must be provided by the **asset owner** if the application is to be processed.
 - (4) The **asset owner** may withdraw an application at any time, provided that it meets all costs incurred by the **system operator** as at the date of the withdrawal of the application. If any costs have been paid in advance, those monies outstanding to the credit of the **asset owner** must immediately be returned to the **asset owner**.
 - (5) An applicant may amend an application being considered by the **system operator** at any time. All amendments must be in writing and submitted to the **system operator** and take effect from the date of receipt.

Compare: Electricity Governance Rules 2003 clause 4 schedule C1 part C

5 **Obligation of asset owner to pay costs**

- (1) The **system operator** and the **asset owner** must agree on the costs involved in processing an application for approval of an **equivalence arrangement** or grant of a **dispensation** and the method for payment to the **system operator** by the **asset owner** of those costs—
 - (a) before the **system operator** proceeds with the application; and
 - (b) at any time during the processing of the application when either—
 - (i) the **system operator** gives written notice to the **asset owner** that it considers the estimate of the likely timeframe involved in processing the application will exceed the estimate given under clause 3(c) or any revised estimate given under clause 4; or
 - (ii) an **asset owner** varies its application and the **system operator**, acting reasonably, considers this variation will change the cost of processing the application.
- (2) The **system operator** is entitled not to proceed until agreement on costs is reached at any of these stages.

Compare: Electricity Governance Rules 2003 clause 5 schedule C1 part C

Clause 5(1)(b)(i): amended, on 5 October 2017, by clause 110 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

6 **Special provisions relating to the grant of dispensations**

- (1) Before granting a **dispensation**, the **system operator** must issue a draft decision on the application. The draft decision must be published on the **system operator register** and must include—
 - (a) an assessment by the **system operator** of the technical issues; and
 - (b) advice from the **system operator** about any changes required to **ancillary services** procurement as a result of the proposed **dispensation**.
- (2) If changes are required to the **procurement plan**, the draft decision must be conditional

on the **procurement plan** being amended appropriately in accordance with clauses 7.13 to 7.22.

- (3) A **participant** may make a submission to the **system operator** on the application that resulted in the publication of the draft decision no later than 10 **business days** after the draft decision is recorded on the **system operator register**.
- (4) The **system operator** must—
 - (a) consider all submissions; and
 - (b) give written notice of its decision on an application to the **participant** who made the application.

Compare: Electricity Governance Rules 2003 clause 6 schedule C1 part C

Clause 6(2): amended, on 1 August 2023, by clause 28 of the Electricity Industry Participation Code Amendment (System Operation Documents) 2023.

Clause 6(4): replaced, on 5 October 2017, by clause 111 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 6(2): amended, on 1 March 2024, by clause 29 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2024.

7 Decision of the system operator

The **system operator** must advise all applicants for approval of an **equivalence arrangement** or grant of a **dispensation** of—

- (a) its decision as soon as it is made in writing; and
- (b) the reason for its decision.

Compare: Electricity Governance Rules 2003 clause 7 schedule C1 part C

8 Decisions must be recorded

- (1) An approval of an **equivalence arrangement** or grant of a **dispensation** by the **system operator** must be recorded in the **system operator register**.
- (2) The approval must state the name of the **asset owner**, the date, duration and nature of the **equivalence arrangement** or **dispensation**, including any conditions.
- (3) On request, and at the cost of the person making the request, the **system operator** must supply all background information in relation to its decision to that person, other than information designated as commercially sensitive by the relevant **asset owner**.

Compare: Electricity Governance Rules 2003 clause 8 schedule C1 part C

Schedule 8.2

cls 8.48 and 8.50

Approval of alternative ancillary service arrangement

1 Process for approval of alternative ancillary service arrangement

- (1) An application for an **alternative ancillary service arrangement** must—
 - (a) be in writing; and
 - (b) specify the **ancillary service** for which approval for an **alternative ancillary service arrangement** is sought; and
 - (c) provide supporting information for the application, including sufficient information about the actual capability of the **asset** or configuration of **assets**; and
 - (d) describe any remedial action planned to return the **asset** or configuration of **assets** to a compliant state; and
 - (e) specify the required term of the **alternative ancillary service arrangement**; and
 - (f) indicate any information for which confidentiality is sought on the grounds that it would, if disclosed, unreasonably prejudice the commercial position of the person who supplied the information (or the person who is the subject of that information), or would disclose a trade secret, or on the ground that it is necessary to protect information which is itself subject to an obligation of confidence.
- (2) No later than 5 **business days** after receiving the application under subclause (1), the **system operator** must—
 - (a) record the name of the **asset owner** making the application, the date and the subject matter of the application in the **system operator register**; and
 - (b) give written notice to the **Authority** of the application; and
 - (c) provide the **asset owner** with an estimate of the likely time it will take to consider the application and the likely costs associated with processing the application.
- (3) The **system operator** and the **asset owner** must agree on the costs involved in processing an application for authorisation of an **alternative ancillary service arrangement** and the method for payment to the **system operator** by the **asset owner** of those costs—
 - (a) before the **system operator** proceeds with the application; and
 - (b) at any time during the processing of the application, the **system operator** is entitled not to proceed until agreement is reached if either—
 - (i) the **system operator** gives written notice to the **asset owner** that it considers the estimate of the likely timeframe and costs involved in processing the application will exceed the estimate given under subclause (2)(c); or
 - (ii) an **asset owner** varies its application and the **system operator**, acting reasonably, considers this variation will change the costs in processing the application.

Compare: Electricity Governance Rules 2003 clauses 1.1 to 1.3 schedule C2 part C

Clause 1(2): amended, on 20 December 2021, by clause 13 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2019.

Clause 1(2)(b) and (3)(b)(i): amended, on 5 October 2017, by clause 112(1) and (2) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

2 Obligations in processing applications

- (1) The **system operator** must use reasonable endeavours to process an application for authorisation of an **alternative ancillary service arrangement** within the timeframe and costs estimated in accordance with clause 1(2)(c).
- (2) If the **system operator** cannot process an application within the timeframe and costs originally estimated, it must give notice of this fact and its amended estimates of timeframe and costs to the **asset owner** and the provisions of clause 1(3) must apply in respect of those costs.
- (3) The **system operator** may require the provision of additional information at any stage during the application process and, provided the **system operator's** requirements are reasonable, that information must be provided by the **asset owner** if the application is to be processed.
- (4) The **asset owner** may withdraw an application at any time provided that it meets all costs incurred by the **system operator** as at the date of withdrawal of the application. If those costs have been paid in advance, those monies outstanding to the credit of the **asset owner** must immediately be returned to the **asset owner**.
- (5) An applicant may amend an application being considered by the **system operator** at any time. All amendments must be in writing and submitted to the **system operator** and must take effect from the date of receipt.

Compare: Electricity Governance Rules 2003 clause 1.4 schedule C2 part C

3 Decision of the system operator

The **system operator** must advise all applicants for authorisation of an **alternative ancillary service arrangement** of its decision as soon as it is made in writing, and advise such applicants of the reason for that decision.

Compare: Electricity Governance Rules 2003 clause 1.5 schedule C2 part C

4 Decisions must be recorded

An authorisation of an **alternative ancillary service arrangement** by the **system operator** must be recorded in the **system operator register**. Except for information that the **system operator** agreed was commercially sensitive, the authorisation must state the name of the **asset owner**, the date, duration and nature of the **alternative ancillary service arrangement**, including any conditions. On request, and at the cost of the person making the request, the **system operator** must supply all background information in relation to its decision to that person, other than information designated as commercially sensitive by the relevant **asset owner**.

Compare: Electricity Governance Rules 2003 clause 1.6 schedule C2 part C

Schedule 8.3 Technical codes

cl 1.1

Technical Code A – Assets

1 Purpose

The purpose of this **technical code** is to define obligations for **asset owners** and technical standards for **assets** that are supportive of, or more detailed than, those set out in subpart 2 of Part 8, in order to enable the **system operator** to plan to comply, and to comply, with the **principal performance obligations**.

Compare: Electricity Governance Rules 2003 clause 1 technical code A schedule C3 part C

2 General requirements

- (1) Each **asset owner** must ensure that—
 - (a) its **assets** at **grid exit points** and at **grid injection points**, and, in the case of **connected asset owners**, the **assets** of any **embedded generator** connected to it, are identified and referred to by a **system number**; and
 - (b) its **assets**, both in the manner in which they are designed and operated, are capable of being operated, and operate, within the limits stated in the **asset capability statement** provided by the **asset owner** for that **asset**; and
 - (c) it meets any other reasonable requirements of the **system operator**, identified during planning studies, which are required for the **system operator** to plan to comply, or to comply, with its **principal performance obligations**.
- (2) Each **asset owner** must provide the **system operator** with an **asset capability statement**, and any other information reasonably required by the **system operator**, to allow the **system operator** to assess compliance of its **asset** or any configuration of **assets** with the requirements of the **asset owner performance obligations** and **technical codes** at each of the following times:
 - (a) before the completion of planning for the construction of that **asset** or configuration of **assets**;
 - (b) at, or before, the completion of construction but before the **commissioning** of that **asset** or configuration of **assets**, except that the **asset owner** must put in place a **commissioning** plan in accordance with subclauses (6) to (8) to minimise the impact of **commissioning** tests on the **system operator's** ability to comply with its **principal performance obligations**, and adhere to this plan during **commissioning**, unless otherwise agreed to by the **system operator**.
- (3) On, or before, completion of **commissioning** of an **asset** or configuration of **assets**, the **asset owner** must obtain a final assessment in writing from the **system operator** that the **asset** or configuration of **assets** meets the requirements of the **asset owner performance obligations** and **technical codes**. This final assessment must be based on the information supplied by the **asset owner** and, if necessary, the result of **system tests** at **commissioning**.
- (4) The **system operator** must give the assessment referred to in subclause (2)(b) within a

- reasonable time frame of the request and supply the **asset owner** with all information that supports its assessment. Any permission granted by the **system operator** to an **asset owner** to conduct **commissioning** of any **asset** or configuration of **assets** must permit connection of the **asset** (or configuration of **assets**) solely for the purposes of **commissioning**.
- (5) Each **asset owner** must provide the **system operator** with an **asset capability statement** in the form from time to time **published** by the **system operator** for each **asset** that is proposed to be connected, or is connected to, or forms part of the **grid**. The **asset capability statement** must—
- (a) include all information reasonably requested by the **system operator** so as to allow the **system operator** to determine the limitations in the operation of the **asset** that the **system operator** needs to know for the safe and efficient operation of the **grid**; and
 - (b) include any modelling data for the planning studies, as reasonably requested by the **system operator**; and
 - (c) be updated and reissued to the **system operator** as information and design development progresses through the study, design, manufacture, testing and **commissioning** phases; and
 - (d) be complete and up to date before the **commissioning** of the **asset**; and
 - (e) be complete and up to date at all times while the **asset** is connected to, or forms part of, the **grid**.
- (6) Each **asset owner** must provide a **commissioning** plan or test plan in accordance with subclauses (7) or (8) (as the case may be) in the following situations:
- (a) when changes are made to **assets** that alter any of the following at the **grid interface**:
 - (i) the **single-line diagram**;
 - (ii) a protection system, other than a change to a protection system setting;
 - (iii) a **control system**, including a change to a **control system** setting;
 - (iv) any rating of **assets**;
 - (b) when **assets** are to be connected to, or are to form part of, the **grid**;
 - (c) if it is necessary for an **asset owner** to perform a **system test** or other test to ascertain or confirm **asset** capabilities, and if the **commissioning** or testing or connection of those **assets** may affect the **system operator**'s ability to plan to comply, or to comply with, its **principal performance obligations**. If an **asset owner** is unsure whether the **commissioning** or connection of an **asset** may impact on the **system operator**'s ability to plan to comply, and to comply, with the **principal performance obligations** it must contact the **system operator** for advice.
- (7) The **commissioning** plan prepared by an **asset owner** and agreed by the **system operator** must—
- (a) include a timetable containing the sequence of events necessary to connect the **assets** to the **grid** and conduct any proposed **system test**; and
 - (b) contain the protection and control settings to be applied before the **assets** are made live (where live has the meaning given to it in the Electricity (Safety)

- Regulations 2010); and
- (c) contain the procedures for **commissioning** the plant with minimum risk to personnel and plant and to the ability of the **system operator** to plan to comply and to comply with its **principal performance obligations**.
- (8) If a test plan is required under subclause (6), it must be prepared by the **asset owner** in consultation with the **system operator**. The test plan must contain sufficient information to enable the **system operator** to plan to comply, and to comply, with the **principal performance obligations**.
- (9) Once assessed by the **system operator** acting reasonably, the **asset owner** must follow the **commissioning** plan or test plan at all times, unless otherwise agreed with the **system operator** (such agreement must not be unreasonably withheld if compliance with the **commissioning** plan or testing plan is not practicable and non-compliance does not impact on the **system operator's** ability to comply with its **principal performance obligations** or on other **asset owners**).

Compare: Electricity Governance Rules 2003 clause 2 technical code A schedule C3 part C

Clause 2(1)(a): amended, on 1 February 2016, by clause 17 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Clause 2(1)(a): amended, on 20 December 2021, by clause 14 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2019.

Clause 2(1) and (4) – (7): amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

Clause 2(1) - (7) and (9): amended, on 5 October 2017, by clause 113 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

3 Requirements for asset information

- (1) In accordance with clause 8.25(4), the following information is required by the **system operator** to assist it to plan to comply, and to comply, with its **principal performance obligations**:
- (a) sufficient information must be exchanged between the **system operator** and the **asset owner** to ensure that both fully understand the implications of any changes to the **asset capability statement** or of any proposed connection of the relevant **assets** to the **grid** or to the **local network**. This information must be exchanged in accordance with a timetable agreed to by the **system operator** and the **asset owner**;
 - (b) if reasonably requested by the **system operator**, the **asset owner** must provide sufficient information to the **system operator** to demonstrate the compliance of the **asset owner's assets** with the **asset owner performance obligations** and the **technical codes**.
- (2) Information about an **asset, supply** or **demand** of other **asset owners** must only be disclosed by the **system operator**—
- (a) as expressly provided for in this Code; or
 - (b) as reasonably required in a **grid emergency** or to ensure the security of the **grid**;
or
 - (c) as required by law; or
 - (d) otherwise as may be agreed with the relevant **asset owners**.
- (3) Each **asset owner** must provide the **system operator** with—
- (a) all information reasonably requested by the **system operator** so as to ensure

compliance with clause 8.25(4) and to enable the **system operator** to assess the **grid interface**; and

- (b) details of protection systems, including settings, to ensure that the requirements of clause 8.25(4) are met.
- (4) Each **asset owner** must ensure that all supporting information for the operational control of **assets** is kept up to date.

Compare: Electricity Governance Rules 2003 clause 3 technical code A schedule C3 part C

Clause 3(1)(a): amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

Clause 3(1)(a): amended, on 5 October 2017, by clause 114 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 3(2): amended, on 20 December 2021, by clause 15(a) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2019.

Clause 3(2)(cc): amended, on 20 December 2021, by clause 15(b) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2019.

4 Requirements for grid and grid interface

- (1) Each **asset owner** and **grid owner** must co-operate with the **system operator** to ensure that protection systems on both sides of a **grid interface**, which include **main protection systems** and **back up protection systems**, are co-ordinated so that a faulted **asset** is **electrically disconnected** by the **main protection system** first and the other **assets** are not prematurely **electrically disconnected**.
- (2) A proposed **grid interface**, including the settings of any associated protection system, must be agreed between the relevant **asset owner** and the **system operator** before being implemented.
- (3) Each **asset owner** must ensure that sufficient **circuit breakers** are provided for its **assets** so that each of its **assets** is able to be **electrically disconnected** from the **grid** whenever a fault occurs within the **asset**.
- (4) Each **asset owner** must ensure that it provides protection systems for its **assets** that are connected to, or form part of, the **grid**. Each **asset owner** must also ensure that as a minimum requirement—
- (a) such protection systems support the **system operator** in planning to comply, and complying, with the **principal performance obligations** and are designed, **commissioned** and maintained, and settings are applied, to achieve the following performance in a reliable manner:
- (i) **electrically disconnect** any faulted **asset** in minimum practical time (taking into account selectivity margins and industry best design practice) and minimum disruption to the operation of the **grid** or other **assets**:
- (ii) be selective when operating, so that the minimum amount of **assets** are **electrically disconnected**:
- (iii) as far as reasonably practicable, preserve power system stability; and
- (b) it provides duplicated **main protection systems** for each of its **assets** at voltages of 220 kV a.c. or above, other than busbars; and
- (c) it provides, for each of its 220 kV a.c. busbars—
- (i) a single **main protection system** and a **back up protection system**; or
- (ii) if the performance of its **back up protection system** does not meet the requirements of paragraph (a), a duplicated **main protection system**; and

- (d) it provides duplicated **main protection systems** for each of its busbars at voltages above 220 kV a.c; and
 - (e) it designs, tests and maintains its **main protection systems** at voltages of 220 kV a.c. or above in accordance with the requirements set out in Appendix A; and
 - (f) it provides a **circuit breaker failure protection system**, that need not be duplicated, for each **circuit breaker** at voltages of 220 kV a.c. or above. **Circuit breaker** duplication is not required; and
 - (g) protection system design for a connection of **assets** to the **grid** at lower voltages must be similar to existing design practice in adjacent connections of **assets** to ensure coordination of protection systems.
- (5) At a **point of connection**—
- (a) an **asset owner**, other than a **grid owner**, must provide a means of checking **synchronisation** before the switching of **assets** if it is possible that such switching may result in **electrical connection** of parts of the New Zealand electric power system that are not **synchronised**; and
 - (b) a **grid owner** must provide a means of checking **synchronisation** before the switching of **assets** in locations agreed with the **system operator** so that it is not possible for such switching to result in **electrical connection** of parts of the New Zealand electric power system that are not **synchronised**.
- (6) An auto-reclose facility at the **grid interface**, at which power flows into the **grid** can occur, must include an appropriate **synchronising** check facility.

Compare: Electricity Governance Rules 2003 clause 4 technical code A schedule C3 part C

Clause 4 Heading: amended, on 15 May 2014, by clause 11 of the Electricity Industry Participation (Minor Code Amendments) Code Amendment 2014.

Clause 4(1), (3), (4) and (5): amended, on 5 October 2017, by clause 115 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 4(4) and (5): amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

5 Specific requirements for generators

- (1) Each **generator** must ensure that—
- (a) each of its **generating units**, and its associated **control systems**,—
 - (i) supports the **system operator** to plan to comply, and to comply, with the **principal performance obligations**; and
 - (ii) is able to **synchronise** at a stable frequency within the frequency range stated in the **asset capability statement** for that **asset**; and
 - (b) the rate of change in the output of any of its **generating units** does not adversely affect the **system operator's** ability to plan to comply, and to comply, with the **principal performance obligations**. The rate of change must be adjustable to allow for changes in **grid** conditions; and
 - (c) each of its **generating units** has a speed governor that—
 - (i) provides stable performance with adequate damping; and
 - (ii) has an adjustable droop over the range of 1% to 7%; and
 - (iii) does not adversely affect the operation of the **grid** because of any of its non-linear characteristics; and
 - (d) appropriate speed governor settings to be applied before commencing **system**

- tests for a **generating unit** are agreed between the **system operator** and the **generator**. The performance of the **generating unit** is then assessed by measurements from **system tests** and final settings are then applied to the **generating unit** before making it ready for service after those final settings are agreed between the **system operator** and the **generator**. An **asset owner** must not change speed governor settings without **system operator** approval.
- (2) Each **generator** must ensure that each of its **generating units** connected to the **grid** is equipped with—
- (a) an excitation and voltage control system with a voltage set point that is adjustable over the range of voltage set out in clause 8.23 and operates continuously in the voltage control mode when **synchronised**; and
 - (b) in order to meet the **asset owner performance obligations**, either—
 - (i) a connection transformer with an appropriate range of taps on each transformer together with an on-load tap-changer; or
 - (ii) **assets** to give a dynamic performance equivalent to those required by subparagraph (i).
- (3) If the output of more than 1 **generating unit** is controlled by a common **control system**, the **generator** must ensure that—
- (a) the common **control system** does not adversely affect the ability of the **system operator** to plan to comply, and to comply, with the **principal performance obligations**; and
 - (b) the combined output from the **generating units** performs as though it were from 1 **generating unit**; and
 - (c) the **control system** does not degrade the individual performance of any one **generating unit**.
- (4) Each **generator** and **grid owner** must ensure that each of its **assets** is capable of operating under the voltage imbalance conditions stated in clause 4.9 of the **Connection Code** and, when operated within the limits stated in its **asset capability statement**, does not—
- (a) contribute unbalanced phase currents into the **grid**; or
 - (b) aggravate any current imbalance that may occur on the **grid**.
- (5) At some **points of connection**, a **generator** must ensure that its **generating units** have both **main protection systems** and **back-up protection systems** for nearby faults on the **grid**, if the necessity for, and the method of providing, such protection systems is agreed between the **system operator** and the **generator**.

Compare: Electricity Governance Rules 2003 clause 5 technical code A schedule C3 part C

Clause 5(2): amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

Clause 5(2): amended, on 5 October 2017, by clause 116 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 5(2): amended, on 20 December 2021, by clause 16 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2019.

Clause 5(4): amended, on 19 May 2016, by clause 29 of the Electricity Industry Participation Code Amendment (System Operator and Alignment with Statutory Objective) 2016.

Clause 5(1)(c)(ii): amended, on 1 March 2024, by clause 30 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2024.

6 Specific requirements for connected asset owners

Each **connected asset owner** must agree with the **system operator** any temporary or permanent connection of the **connected asset owner's assets** if those **assets** become simultaneously connected to the **grid** at more than 1 **point of connection**.

Compare: Electricity Governance Rules 2003 clause 6 technical code A schedule C3 part C

Clause 6 Heading: amended, on 1 February 2016, by clause 18(1) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Clause 6: amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

Clause 6: amended, on 1 February 2016, by clause 18(2) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Clause 6: amended, on 5 October 2017, by clause 117 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

7 Modifications and changes to assets

(1) **Assets** that have been modified, or are proposed to be modified, are deemed to be new **assets** for the purposes of this Code and this **Technical Code** and are subject to the requirements for connection to the **grid** and the requirements for **commissioning assets**. For the purposes of this Schedule, the following are considered to be modifications to **assets**, if the new connection or alteration may affect the capacity of the **assets** or may affect **asset owner performance obligations** or **technical code** requirements:

- (a) a new connection of **assets** to the **grid** or a **local network**;
- (b) a new connection of **assets** to form part of the **grid**;
- (c) a new connection of an **embedded generator** to a **local network** other than an **excluded generator** as defined in clause 8.21(1);
- (d) an alteration to **assets** already connected to the **grid** or, in the case of **embedded generator**, already connected to a **local network**.

(2) The **asset owner** must give written notice to the **system operator** in a timely manner of any **assets** that have been **decommissioned** if the **assets** affect or could affect the **system operator's** ability to comply with its **principal performance obligations**.

Compare: Electricity Governance Rules 2003 clause 7 technical code A schedule C3 part C

Clause 7(1): amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

Clause 7(1) and (2): amended, on 5 October 2017, by clause 118 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

8 Records, tests and inspections

(1) Each **asset owner** must arrange for, and retain, records for each of its **assets** to demonstrate that the **assets** comply with the **asset owner performance obligations** and this **technical code**.

(2) In addition to the requirements for **commissioning** or testing in clause 2(6) to (8), each **asset owner** must carry out periodic testing—

- (a) of its **assets**, including **automatic under-frequency load shedding** systems, in accordance with Appendix B
- (b) *[Revoked]*.

(3) If the **system operator** advises an **asset owner** that it reasonably believes that an **asset** may not comply with an **asset owner performance obligation** or this **technical code**, the **asset owner** must—

- (a) as soon as practicable, but no later than 30 days after receiving a written request, advise the **system operator** of its remedial or test plan for the **assets**; and
 - (b) as soon as reasonably practicable undertake any remedial action or testing of its **assets** in accordance with its plan advised to the **system operator** in paragraph (a). The **system operator** may require such testing or remedial action to be undertaken in the presence of a **system operator** representative.
- (4) Each **asset owner** must, at the request of the **system operator**, provide access to records of the performance or testing of an **asset** and access to inspect an **asset**.

Compare: Electricity Governance Rules 2003 clause 8 technical code A schedule C3 part C

Clause 8(2): substituted, on 7 August 2014, by clause 16 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Clause 8(2): amended, on 5 October 2017, by clause 119 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 8.2(a): amended, on 21 December 2021, by clause 19(1) of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

Clause 8.2(b): revoked, on 21 December 2021, by clause 19(2) of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

9 Status of system operator approval

A review and approval by the **system operator** under this Code must not be construed as confirming or endorsing the design or warranting the safety, durability or reliability of an **asset**. Such review or approval does not relieve the **asset owner** from its obligations to continue to meet the requirements of this Code. The **system operator** is not, by reason of any such review or lack of review, responsible for strength, adequacy of design or capacity of an **asset**. In undertaking a review, the **system operator** is not responsible for any consequence of a failure of an **asset** due to inadequate design.

Compare: Electricity Governance Rules 2003 clause 9 technical code A schedule C3 part C

Appendix A: Main protection system requirements

1 General requirements

An **asset owner** must design, test and maintain all **main protection systems** at voltages of 220 kV a.c. or above to conform to electricity industry standards and practices as they are reasonably and ordinarily applied by a skilled and experienced **asset owner** to current installations at voltages of 220 kV a.c. or above in the New Zealand context.

Compare: Electricity Governance Rules 2003 clause 1 appendix A technical code A schedule C3 part C

2 Specific requirements for main protection systems

Main protection systems at voltages of 220 kV a.c. or above must meet the requirements set out below:

- (a) either test blocks or both test switches and test terminals must be provided:
- (b) the electrical continuity of fused protection circuits, including d.c. and voltage transformer circuits must be supervised:
- (c) the electrical continuity of **circuit breaker** trip circuits must be supervised.

Compare: Electricity Governance Rules 2003 clause 2 appendix A technical code A schedule C3 part C

3 Specific requirements for duplicated main protection systems

Duplicated **main protection systems** (the 2 components of which are referred to in this appendix as main 1 protection and main 2 protection) at voltages of 220 kV a.c. or above must meet the requirements set out below:

- (a) duplicated **main protection systems** must be designed with sufficient coverage and probability of detection that if any or all parts of 1 **main protection system** fail, the other **main protection system electrically disconnects** a faulted **asset** before a **back up protection system** initiates the **electrical disconnection** of other non-faulted **assets**:
- (b) the d.c. supply to duplicated **main protection systems** must consist of 2 independent station batteries, each with its own charger, supervision, and with a capacity and carry over duty to cover charger failure until repair and restoration. Station batteries may only feed a common primary d.c. busbar provided that the busbar is insulated and isolated from earth:
- (c) the d.c. supply to each duplicated **main protection system** must be independently fused at the primary d.c. busbar:
- (d) the manufacturer of main 1 protection must not be the same as the manufacturer of main 2 protection, unless one protection uses different measurement principles from the other:
- (e) the current transformer core (or an equivalent instrument) and the cabling associated with that current transformer core or equivalent instrument (as the case may be) used for main 1 protection must be independent from that used for main 2 protection:
- (f) if a voltage transformer supply is required for main 1 or main 2 protection—
 - (i) the supply must be fused at the voltage transformer; and
 - (ii) the supply for main 1 protection must use an independent fuse and cable

from those used for main 2 protection:

- (g) main 1 protection must use, in each of the **circuit breakers** tripped by that main 1 protection, an independent trip coil from that used for main 2 protection:
- (h) if protection signalling is used, main 1 protection must use a signal channel over an independent bearer on a different route from that used for main 2 protection:
- (i) main 1 protection cabling must be segregated from main 2 protection cabling in a manner that minimises the risk of common mode failure of main 1 and 2 protection and minimises the number of connections in any protection circuit.

Compare: Electricity Governance Rules 2003 clause 3 appendix A technical code A schedule C3 part C Clause 3(a) and (i): amended, on 5 October 2017, by clause 120 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.
Clause 3(i): amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

4 Existing equipment

Despite clauses 1 and 3—

- (a) a current transformer **commissioned** before 31 May 2007 is not required to comply with clause 3(e) until the current transformer is replaced; and
- (b) a **circuit breaker commissioned** before 31 May 2007, if not designed to incorporate a second trip coil, is not required to comply with clause 3(g) until the **circuit breaker** is replaced; and
- (c) cabling **commissioned** before 31 May 2007, if not designed to be segregated, is not required to comply with the segregation requirements of clause 3(i) until the cabling is replaced.

Compare: Electricity Governance Rules 2003 clause 4 appendix A technical code A schedule C3 part C Clause 4: amended, on 5 October 2017, by clause 121 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Appendix B: Routine testing of assets and automatic under-frequency load shedding systems

Cross heading: amended, on 7 August 2014, by clause 17 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Cross heading: amended, on 21 December 2021, by clause 20 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

1 Periodic tests to be carried out

- (1) This Appendix sets out periodic tests required for the purposes of clause 8(2) of **Technical Code A**.
- (2) Each **asset owner** may be legally required, other than under this Code, to carry out additional tests to ensure that their **assets**, including **automatic under-frequency load shedding** systems, are safe and reliable.
- (3) For the purposes of this Appendix, **generating unit** does not include a **generating unit** for which wind is the primary power source.

Compare: Electricity Governance Rules 2003 clause 1 appendix B technical code A schedule C3 part C

Clause 1: substituted, on 7 August 2014, by clause 18 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Clause 1(2): amended, on 21 December 2021, by clause 21 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

2 Generating unit frequency response

Each **generator**, other than **generators** who are owners of **excluded generating stations** that are not subject to a directive issued by the **Authority** under clause 8.38, must—

- (a) test the trip frequencies and trip time delays of each of its **generating units'** analogue over-frequency relays and analogue under-frequency relays at least once every 4 years; and
- (b) test the trip frequencies and trip time delays of each of its **generating units'** non-self monitoring digital over-frequency relays and non-self monitoring digital under-frequency relays at least once every 4 years; and
- (c) test the trip frequencies and trip time delays of each of its **generating units'** self monitoring digital over-frequency relays and self monitoring digital under-frequency relays at least once every 10 years; and
- (d) based on the tests carried out in accordance with paragraphs (a) to (c), provide a verified set of under-frequency trip settings and time delays to the **system operator** in an updated **asset capability statement** within 3 months of the completion date of each such test; and
- (e) based on the tests carried out in accordance with paragraphs (a) to (c), provide a verified set of over-frequency trip settings and time delays to the **system operator** in an updated **asset capability statement** within 3 months of the completion date of each such test.

Compare: Electricity Governance Rules 2003 clause 2 appendix B technical code A schedule C3 part C

3 Generating unit governor and speed control

Each **generator**, other than **generators** who are owners of **excluded generating stations** that are not subject to a directive issued by the **Authority** under clause 8.38 must—

- (a) test the governor system response of each of its **generating units**' mechanical or analogue speed governors at least once every 5 years; and
- (b) test the governor system response of each of its **generating units**' digital or electro-hydraulic speed governors at least once every 10 years; and
- (c) based on the tests carried out in accordance with paragraphs (a) or (b), provide a verified set of modelling parameters and governor system response data to the **system operator** in an updated **asset capability statement** within 3 months of the completion date of each such test, including—
 - (i) a block diagram showing the mathematical representation of the governor; and
 - (ii) a block diagram showing the mathematical representation of the turbine dynamics including non-linearity and the applicable fuel source; and
 - (iii) a parameter list showing gains, time constants and other settings applicable to the block diagrams.

Compare: Electricity Governance Rules 2003 clause 3 appendix B technical code A schedule C3 part C

4 **Generating unit transformer voltage control**

Each **generator** with a **point of connection** to the **grid** must—

- (a) test the operation of each of its **generating unit** transformers' on-load tap changer analogue **control systems** at least once every 4 years; and
- (b) test the operation of each of its **generating unit** transformers' on-load tap changer digital **control systems** at least once every 10 years; and
- (c) based on the tests carried out in accordance with paragraphs (a) or (b), provide a verified set of control parameters including voltage set points, operating dead bands and response times to the **system operator** in an updated **asset capability statement** within 3 months of the completion date of each such test.

Compare: Electricity Governance Rules 2003 clause 4 appendix B technical code A schedule C3 part C

5 **Generating unit voltage response and control**

Each **generator** with a **point of connection** to the **grid** must—

- (a) test the modelling parameters and voltage response of each of its **generating units**' analogue excitation systems at least once every 5 years; and
- (b) test the modelling parameters and voltage response of each of its **generating units**' digital excitation systems at least once every 10 years; and
- (c) based on the tests carried out in accordance with paragraphs (a) or (b), provide a verified set of modelling parameters and voltage response data to the **system operator** in an updated **asset capability statement** within 3 months of the completion date of each such test, including—
 - (i) a block diagram showing the mathematical representation of the automatic voltage regulator; and
 - (ii) a block diagram showing the mathematical representation of the exciter; and
 - (iii) a parameter list showing gains, time constants and other settings applicable to the block diagrams.

Compare: Electricity Governance Rules 2003 clause 5 appendix B technical code A schedule C3 part C

6 North Island connected asset owner automatic under-frequency load shedding systems profiles and trip settings

Each North Island **connected asset owner** must—

- (a) provide the profile information described in clause 7(9) of **Technical Code B** of Schedule 8.3 to the **system operator** in an updated **asset capability statement** at least once every year; and
- (b) test the operation of its analogue **automatic under-frequency load shedding** systems at least once every 4 years; and
- (c) test the operation of its non-self monitoring digital **automatic under-frequency load shedding** systems at least once every 4 years; and
- (d) test the operation of its self monitoring digital **automatic under-frequency load shedding** systems at least once every 10 years; and
- (e) based on the relevant test carried out in accordance with paragraphs (b), (c) or (d), provide a verified set of trip settings and time delays to the **system operator** in an updated **asset capability statement** within 3 months of the completion date of the relevant test.

Compare: Electricity Governance Rules 2003 clause 6 appendix B technical code A schedule C3 part C
Clause 6: revoked, on 7 August 2014, by clause 19 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.
Clause 6: replaced, on 21 December 2021, by clause 22 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

7 South Island grid owner automatic under-frequency load shedding systems profiles and trip settings

Each South Island **grid owner** must—

- (a) provide the profile information described in clause 7(9) of **Technical Code B** of Schedule 8.3 to the **system operator** in an updated **asset capability statement** at least once every year; and
- (b) test the operation of its analogue **automatic under-frequency load shedding** systems at least once every 4 years; and
- (c) test the operation of its non-self monitoring digital **automatic under-frequency load shedding** systems at least once every 4 years; and
- (d) test the operation of its self monitoring digital **automatic under-frequency load shedding** systems at least once every 10 years; and
- (e) based on the relevant test carried out in accordance with paragraphs (b), (c) or (d), provide a verified set of trip settings and time delays to the **system operator** in an updated **asset capability statement** within 3 months of the completion date of the relevant test.

Compare: Electricity Governance Rules 2003 clause 7 appendix B technical code A schedule C3 part C
Clause 7: revoked, on 7 August 2014, by clause 19 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.
Clause 7: replaced, on 21 December 2021, by clause 22 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

8 Grid owner transformer voltage range

Each **grid owner** must—

- (a) test the operation of each of its transformers' on-load tap changer analogue **control systems** at least once every 4 years; and
- (b) test the operation of each of its transformers' on-load tap changer digital **control systems** at least once every 10 years; and
- (c) based on the tests carried out in accordance with paragraphs (a) or (b), provide a verified set of control parameters to the **system operator** in an updated **asset capability statement** within 3 months of the completion date of each such test, including voltage set points, operating dead bands and response times.

Compare: Electricity Governance Rules 2003 clause 8 appendix B technical code A schedule C3 part C

9 Grid owner static var compensator transient response and control

Each **grid owner** must—

- (a) test the transient response, steady state response and a.c. disturbance response of each of its static var compensators at least once every 10 years; and
- (b) test the operation of each of its static var compensators' analogue **control systems** at least once every 4 years; and
- (c) test the operation of each of its static var compensators' digital **control systems** at least once every 10 years; and
- (d) based on the test carried out in accordance with paragraph (a), provide a verified set of modelling parameters, transient response parameters, steady state response parameters, and a.c. disturbance response data to the **system operator** in an updated **asset capability statement** within 3 months of the completion date of each such test including—
 - (i) a block diagram showing the mathematical representation of the static var compensator; and
 - (ii) a parameter list showing gains, time constants, limiters and other settings applicable to the block diagrams; and
 - (iii) a detailed functional description of all of the components of the static var compensator and how they interact in each mode of control; and
 - (iv) step response test results; and
 - (v) a.c. fault recovery disturbance test results; and
- (e) based on tests carried out in accordance with paragraphs (b) or (c), provide a set of **control system** test results to the **system operator** in an updated **asset capability statement** within 3 months of the completion date of each such test.

Compare: Electricity Governance Rules 2003 clause 9 appendix B technical code A schedule C3 part C

10 Grid owner capacitors and reactive power control systems

Each **grid owner** must—

- (a) test the capacitance of each of its capacitors at least once every 8 years; and
- (b) test the operation of each of its reactive power control assets' analogue **control systems** at least once every 4 years; and
- (c) test the operation of each of its reactive power control assets' digital **control systems** at least once every 10 years; and
- (d) based on the test carried out in accordance with paragraph (a), provide a set of test

results to the **system operator** in an updated **asset capability statement** within 3 months of the completion date of each such test; and

- (e) based on tests carried out in accordance with paragraphs (b) or (c), provide a verified set of **control system** test results including voltage set points, operating dead bands and time delays to the **system operator** in an updated **asset capability statement** within 3 months of the completion date of each such test.

Compare: Electricity Governance Rules 2003 clause 10 appendix B technical code A schedule C3 part C

11 Grid owner synchronous compensators

Each **grid owner** must—

- (a) test each of its synchronous compensators' analogue and electromechanical excitation systems at least once every 5 years; and
- (b) test each of its synchronous compensators' digital excitation systems at least once every 10 years; and
- (c) based on the tests carried out in accordance with paragraphs (a) or (b), provide a verified set of modelling parameters and voltage response data to the **system operator** in an updated **asset capability statement** within 3 months of the completion date of each such test including—
- (i) a block diagram showing the mathematical representation of the automatic voltage regulator; and
- (ii) a block diagram showing the mathematical representation of the exciter; and
- (iii) a detailed functional description of the excitation system in all modes of control; and
- (iv) a parameter list showing gains, time constants, limiters and other settings applicable to the block diagrams.

Compare: Electricity Governance Rules 2003 clause 11 appendix B technical code A schedule C3 part C

12 HVDC link frequency control and protection

The **HVDC owner** must—

- (a) test the operation of each of its **HVDC link's** analogue **control systems** at least once every 4 years; and
- (b) test the operation of each of its **HVDC link's** digital **control systems** at least once every 10 years; and
- (c) test the operation of each of its **HVDC link's** analogue protection systems at least once every 4 years; and
- (d) test the operation of each of its **HVDC link's** digital protection systems at least once every 10 years; and
- (e) test the modulation functions on its **HVDC link** at least once every 10 years; and
- (f) based on the tests carried out in accordance with paragraphs (a) or (b), provide a set of **control system** test results and verified modelling parameters to the **system operator** in an updated **asset capability statement** within 3 months of the completion date of each such test; and
- (g) based on the tests carried out in accordance with paragraphs (c) or (d), provide a set of protection system test results to the **system operator** in an updated **asset**

- capability statement** within 3 months of the completion date of each such test; and
- (h) based on the tests carried out in accordance with paragraph (e), provide a set of modulation function test results to the **system operator** in an updated **asset capability statement** within 3 months of the completion date of each such test including—
- (i) a block diagram showing the mathematical representation of the **HVDC link**; and
 - (ii) a parameter list showing gains, time constants, limiters and other settings applicable to the block diagram; and
 - (iii) a detailed functional description of all of the components of the **HVDC link** and how they interact in each mode of control.

Compare: Electricity Governance Rules 2003 clause 12 appendix B technical code A schedule C3 part C

13 Asset owner a.c. protection systems

Each **asset owner** must—

- (a) test the operation of the analogue protection systems on its a.c. **assets** at least once every 4 years; and
- (b) test the operation of the non-self monitoring digital protection systems on its a.c. **assets** at least once every 4 years; and
- (c) test the operation of the self monitoring digital protection systems on its a.c. **assets** at least once every 10 years; and
- (d) test the operation of the protection system measuring circuits on its a.c. **assets** by secondary injection at least once every 4 years; and
- (e) test the operation of the protection system trip circuits, including circuit breaker trips, on its a.c. **assets** at least once every 4 years; and
- (f) confirm at least once every 4 years that its protection settings are identified, coordinated, applied correctly and meet the requirements of the **AOPOs** and the **technical codes**; and
- (g) based on tests carried out in accordance with paragraphs (a) to (e), provide a verification to the **system operator** in an updated **asset capability statement** that the protection systems meet the requirements of the **AOPOs** and **technical codes** within 3 months of the completion date of each such test; and
- (h) based on the confirmation carried out in accordance with paragraph (f), provide an updated **asset capability statement** to the **system operator** within 3 months of the completion date of each such confirmation.

Compare: Electricity Governance Rules 2003 clause 13 appendix B technical code A schedule C3 part C

14 Representative testing

- (1) Subject to clause 8(3) of **Technical Code A**, each **asset owner** may provide the information required under clauses 3(c), 5(c), and 11(c) to the **system operator**, based on representative modelling parameters and response data instead of based on the tests required under clauses 3(a) and (b), 5(a) and (b), and 11(a) and (b), for any group of identical **assets**, if each of those **assets**—

- (a) was manufactured to the same specification; and
 - (b) is installed at the same location; and
 - (c) is controlled in the same way; and
 - (d) has a similar maintenance history.
- (2) Each **asset owner** providing representative modelling parameters and response data to the **system operator** in accordance with subclause (1) for a group of identical **assets** must—
- (a) complete a full set of tests in accordance with clauses 3(a) or (b), 5(a) or (b), and 11(a) or (b), as applicable, on an **asset** that is representative of that group to derive a verified set of modelling parameters and response data; and
 - (b) complete sufficient testing on the remaining **assets** in that group of identical **assets** in accordance with clauses 3(a) or (b), 5(a) or (b), and 11(a) or (b), as applicable, to verify that the performance of the remaining **assets** in that group is fully consistent with the modelling parameters and response data derived from the tests carried out on the representative **asset**; and
 - (c) certify to the **system operator**, that to the best of the **asset owner's** information, knowledge and belief, the performance of that group of **assets** is fully consistent with the representative modelling parameters and response data provided to the **system operator** for that group of **assets**.

Compare: Electricity Governance Rules 2003 clause 14 appendix B technical code A schedule C3 part C

15 Transitional provisions

- (1) Unless a test interval of less than 60 months is specified in this Appendix, each **asset owner** must complete the first of each test required in this Appendix no later than 5 June 2013.
- (2) A test that is required to be carried out in accordance with this Appendix, but that an **asset owner** carried out before 5 June 2008, is deemed to be the first test of that type required in this Appendix, if—
 - (a) the **asset owner** has submitted the relevant written test results to the **system operator**; and
 - (b) the **system operator** has advised the **asset owner** that the specification of the test is acceptable; and
 - (c) the interval between the actual date of the test and the date on which this Code came into force is less than the maximum test interval specified for the corresponding test in this Appendix.
- (3) If a test has been deemed to be the first test in accordance with subclause (2), the date by which the next such test must be carried out must be calculated using the actual date upon which the first test was carried out, not the date upon which it was deemed to have been carried out.

Compare: Electricity Governance Rules 2003 clause 15 appendix B technical code A schedule C3 part C
Clause 15(1): amended, on 21 September 2012, by clause 11(1) of the Electricity Industry Participation (Minor Amendments) Code Amendment 2012.
Clause 15(2): amended, on 21 September 2012, by clause 11(2) of the Electricity Industry Participation (Minor Amendments) Code Amendment 2012.

Technical Code B – Emergencies

1 Purpose and application

The purpose of this **technical code** is to set out the basis on which the **system operator** and **participants** must plan for, anticipate and respond to emergency events on the **grid** that affect the **system operator’s** ability to plan to comply, and to comply with its **principal performance obligations**.

Compare: Electricity Governance Rules 2003 clause 1.1 technical code B schedule C3 part C
Clause 1: amended, on 21 December 2021, by clause 23 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

2 Application

This **technical code** applies to all **asset owners** except for **excluded generating stations**. If the **system operator** reasonably considers it necessary to assist the **system operator** in planning to comply and complying with the **principal performance obligations**, the **system operator** may require that an **excluded generating station** comply with some or all of the requirements of this **technical code**.

Compare: Electricity Governance Rules 2003 clause 1.2 technical code B schedule C3 part C

3 Obligations of all parties

The **system operator** and all **participants** must plan individually and, if appropriate, collectively, for a **grid emergency**, and act quickly and safely during a **grid emergency** in accordance with this **technical code**, so that the actual and potential impacts of any **grid emergency** are minimised.

Compare: Electricity Governance Rules 2003 clause 2 technical code B schedule C3 part C

4 Obligations of the system operator

The **system operator** must use reasonable endeavours to ensure that—

- (a) if necessary, each **participant** is advised of any independent action required of it if there is a **grid emergency**; and
- (b) **grid owners** or other **asset owners** specify to the **system operator** the facilities they have in place to manually **electrically disconnect demand** at each **point of connection**.

Compare: Electricity Governance Rules 2003 clause 3 technical code B schedule C3 part C
Clause 4: amended, on 15 May 2014, by clause 12 of the Electricity Industry Participation (Minor Code Amendments) Code Amendment 2014.
Clause 4(b): amended, on 5 October 2017, by clause 122 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.
Clause 4(b): amended, on 1 March 2024, by clause 31 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2024.

5 Formal notices and responses

- (1) The **system operator** must issue a notice either orally or in writing to relevant **participants** whenever, or as soon as practicable after, any of the following events has occurred:
 - (a) the ability of the **system operator** to plan to comply, and to comply, with the **principal performance obligations** is at risk or is compromised (as set out in the

policy statement):

- (b) public safety is at risk:
 - (c) there is a risk of significant damage to **assets**:
 - (d) independent action has been taken in accordance with this **technical code** to restore the **system operator's principal performance obligations**:
 - (e) an **unsupplied demand situation**.
- (1A) *[Revoked]*
- (1B) *[Revoked]*
- (1C) *[Revoked]*
- (2) The **system operator** must ensure that a **formal notice** issued in accordance with subclause (1) includes the following:
- (a) the electrical or geographical region affected by the notice:
 - (b) the potential consequences of the situation:
 - (c) the responses requested of **participants**:
 - (d) the start time and end time of the situation to which the notice applies.
- (3) The **system operator** must record the issue of a **formal notice**, and each **participant** must record receipt of a **formal notice**.
- (4) If the **system operator** issues a request in accordance with this **technical code** to a **participant**, the **participant** must use reasonable endeavours to respond to the request.

Compare: Electricity Governance Rules 2003 clause 4 technical code B schedule C3 part C

Clause 5(1)(d): inserted, on 1 November 2022, by clause 8(1) of the Electricity Industry Participation Code Amendment (Real Time Pricing) 2022.

Clause 5(1A): inserted, on 1 June 2013, by clause 5(a) of the Electricity Industry Participation (Scarcity Pricing) Code Amendment 2011.

Clause 5(1A): amended, on 5 October 2017, by clause 123 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 5(1A): amended, on 20 December 2021, by clause 17 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2019.

Clause 5(1B): inserted, on 1 June 2013, by clause 5(a) of the Electricity Industry Participation (Scarcity Pricing) Code Amendment 2011. Clause 5(1C): inserted, on 1 June 2013, by clause 5(a) of the Electricity Industry Participation (Scarcity Pricing) Code Amendment 2011.

Clause 5(1A), (1B) and (1C): revoked, on 1 November 2022, by clause 8(2) of the Electricity Industry Participation Code Amendment (Real Time Pricing) 2022. Clause 5(2): amended, on 1 June 2013, by clause 5(b) of the Electricity Industry Participation (Scarcity Pricing) Code Amendment 2011.

Clause 5(2): amended, on 1 November 2022, by clause 8(3) of the Electricity Industry Participation Code Amendment (Real Time Pricing) 2022. Clause 5(2)(d): amended, on 19 January 2017, by clause 4 of the Electricity Industry Participation Code Amendment (Scarcity Pricing) 2016.

5A Request to inform the system operator of available controllable load

- (1) A **connected asset owner** must, as soon as reasonably practicable following a request by the **system operator**, inform the **system operator** of its available **controllable load** using a method or form agreed with the **system operator**.
- (2) A **connected asset owner** must submit **difference bids** to provide the information required under subclause (1) to the **system operator**, unless the **connected asset owner** agrees an alternative form or method for providing this information with the **system operator**.
- (3) For the purposes of subclauses (4) and (5), a **connected asset owner** who submits **difference bids** to the **system operator** under subclause (1) is deemed to be a **purchaser** who purchases **non-dispatch-capable load** at a **conforming GXP** for the purposes of clauses 13.7AA, 13.7AC, 13.7AD, 13.13(2), 13.15, 13.16 and 13.19A.
- (4) If the **system operator** requests information regarding available **controllable load**

under subclause (1), a **connected asset owner** who submits **difference bids** must, as soon as reasonably practicable following a request by the **system operator**—

- (a) submit to the **system operator** for each **trading period** notified by the **system operator** a **difference bid** that represents a reasonable estimate of the available **controllable load** which the **connected asset owner** can use to decrease its **demand**—
 - (i) at each **conforming GXP** in the **connected asset owner's** network or at a **conforming GXP** nominated by the **system operator** and agreed with the **connected asset owner**; and
 - (ii) for the **trading period**; and
 - (iii) at a single price band of \$9,000 per **MWh**; and
 - (b) following any **difference bids** submitted under paragraph (a), submit revised **difference bids** to reflect any changes in the **connected asset owner's** estimate of available **controllable load**, as soon as reasonably practicable following such changes.
- (5) No later than 5 **business days** following a request or requirement from the **system operator** under this **technical code** to reduce or disconnect **controllable load**, a **connected asset owner** who submits **difference bids** to the **system operator** must provide data as reasonably requested by the **system operator** to enable it to confirm the **connected asset owner's** compliance with subclause (4).
- (6) For the purposes of this clause 5A and the definition of **controllable load** in Part 1, a **connected asset owner** means a **distributor** in its capacity as the owner or operator of a **local network**, but excludes—
- (a) an **embedded generator**; and
 - (b) an owner or operator of an **embedded network**.

Clause 5A: inserted, on 3 May 2023, by clause 5 of the Electricity Industry Participation Code Amendment (Discretionary Demand Control) 2023 and expired 3 February 2024.

Clause 5A: inserted, on 1 May 2024, by clause 5 of the Electricity Industry Participation Code Amendment (Controllable Load) 2024.

6 Actions to be taken by the system operator in a grid emergency

- (1) If an **unsupplied demand situation**, or insufficient generation and **frequency keeping** gives rise to a **grid emergency**, the **system operator** may, having regard to the priority below, if practicable, and regardless of whether a **formal notice** has been issued, do 1 or more of the following:
 - (a) request that a **generator** varies its **offer** and **dispatch** the **generator** in accordance with that **offer**, to ensure there is sufficient generation and **frequency keeping**;
 - (b) request that a **purchaser** or a **connected asset owner** reduce **demand**;
 - (c) require a **grid owner** to reconfigure the **grid**;
 - (d) require the **electrical disconnection** of **demand** in accordance with clause 7(20);
 - (e) take any other reasonable action to alleviate the **grid emergency**.
- (2) If insufficient transmission capacity gives rise to a **grid emergency**, the **system operator** may, having regard to the priority below, if practicable, and regardless of whether a **formal notice** has been issued, do 1 or more of the following:
 - (a) request that a **generator** varies its **offer** and **dispatch** the **generator** in accordance with that **offer**, to ensure that the available transmission capacity

within the **grid** is sufficient to transmit the remaining level of **demand**:

- (b) request that an **asset owner** restores its **assets** that are not in service:
 - (c) request that a **purchaser** or **connected asset owner** reduces its **demand**:
 - (d) require the **electrical disconnection of demand** in accordance with clause 7(20):
 - (e) take any other reasonable action to alleviate the **grid emergency**.
- (3) If frequency is outside the **normal band** and all available **injection** has been **dispatched**, the **system operator** may require the **electrical disconnection of demand** in accordance with clause 7(20) in appropriate block sizes until frequency is restored to the **normal band**.
- (4) If any **grid** voltage reaches the minimum voltage limit set out in the table contained in clause 8.22(1), and is sustained at or below that limit, the **system operator** may require the **electrical disconnection of demand** in accordance with clause 7(20) in appropriate block sizes until the voltage is restored to above the minimum voltage limit.
- (5) The **system operator** may, if an unexpected event occurs giving rise to a **grid emergency**, take any reasonable action to alleviate the **grid emergency**.

Compare: Electricity Governance Rules 2003 clause 5 technical code B schedule C3 part C

Clause 6: amended, on 5 October 2017, by clause 124 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 6(1)(b): amended, on 1 February 2016, by clause 19 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Clause 6(1)(d), amended, on 7 August 2014, by clause 20(1) of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Clause 6(2)(c): amended, on 1 February 2016, by clause 19 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Clause 6(2)(d): amended, on 7 August 2014, by clause 20(1) of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Clause 6(3): amended, on 7 August 2014, by clause 20(2) of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Clause 6(4): amended, on 7 August 2014, by clause 20(1) of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Clause 6(1)(d), (2)(d), 3 and 4: amended, on 21 December 2021, by clause 24 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021

Clause 6(1): amended, on 1 November 2022, by clause 9 of the Electricity Industry Participation Code Amendment (Real Time Pricing) 2022.

7 Load shedding systems

- (1) Each North Island **connected asset owner** must ensure, at all times, that an **automatic under-frequency load shedding** system is installed in accordance with subclauses (6) and (6AA).
- (2) Every South Island **grid owner** must ensure, at all times, that an **automatic under-frequency load shedding system** is installed in accordance with subclause (6A) for each **grid exit point** in the South Island.
- (3) Subject to subclause (8), each **connected asset owner** and **grid owner** must use reasonable endeavours to ensure that at all times its **automatic under-frequency load shedding** systems are maintained in accordance with subclauses (6) and (6AA) or (6A) as applicable.
- (4) If, at any time, a North Island **connected asset owner** believes that an **automatic under-frequency load shedding** system may not be capable of meeting the requirements of subclauses (6) or (6AA) or a South Island **grid owner** believes that an **automatic under-frequency load shedding** system may not be capable of meeting the

- requirements of subclause (6A), the relevant **connected asset owner** or **grid owner** must notify the **system operator** as soon as practicable and provide any information that the **system operator** reasonably requests.
- (5) Each South Island **connected asset owner** must co-operate fully with any **grid owner** in relation to an **automatic under frequency load shedding** system installed at any **grid exit points** at which the **connected asset owner** is connected to the **grid**. Each South Island **connected asset owner** must also provide the **grid owner** with any information relating to **automatic under-frequency load shedding** that the **grid owner** reasonably requests.
- (6) An **automatic under-frequency load** shedding system required to be provided in accordance with subclause (1) must enable, at all times, automatic **electrical disconnection of demand** either—
- (a) as 2 blocks of **demand** (each block being a minimum of 16% of the **connected asset owner's** total pre-event **demand**), with—
- (i) block 1 **electrically disconnecting demand** within 0.4 seconds after the frequency reduces to, and remains at or below, 47.8 Hertz; and
- (ii) block 2 **electrically disconnecting demand**—
- (A) 15 seconds after the frequency reduces to, and remains at or below, 47.8 Hertz; and
- (B) within 0.4 seconds after the frequency reduces to, and remains at or below, 47.5 Hertz; or
- (b) in accordance with the **system operator's AUFLS technical requirements report**, as agreed with the **system operator** and subject to subclause (6AA).
- (6AA) Each North Island **connected asset owner** must transition as soon as reasonably practicable, and must be proactively engaging with the **system operator** to transition as soon as reasonably practicable, to an **automatic under-frequency load shedding** system that complies with the **system operator's AUFLS technical requirements report**. The transition must be completed before 30 June 2025.
- (6A) An **automatic under-frequency load shedding** system required to be provided in accordance with subclause (2) must enable, at all times, automatic **electrical disconnection** of 2 blocks of **demand** (each block being a minimum of 16% of the **grid owner's** total pre-event **demand**) subject to subclause (8), with—
- (a) block 1 **electrically disconnecting demand** within 0.4 seconds after the frequency reduces to, and remains at or below, 47.5 Hertz; and
- (b) block 2 **electrically disconnecting demand**—
- (i) 15 seconds after the frequency reduces to, and remains at or below, 47.5 Hertz; and
- (ii) within 0.4 seconds after the frequency reduces to, and remains at or below, 46.5 Hertz.
- (7) To avoid doubt, the **demand** calculated to comprise **automatic under-frequency load shedding** blocks must be net of any **interruptible load** procured by the **system operator**.
- (8) Subject to the **system operator's** agreement, which must not be unreasonably withheld, a **grid owner** may redistribute **automatic under-frequency load shedding** quantities

- between **grid exit points**, if the overall **automatic under-frequency load shedding** quantity obligations in subclause (6A) are met.
- (9) In addition to their obligations to provide information under clauses 6 and 7 of Appendix B of **Technical Code A**, each North Island **connected asset owner** and each South Island **grid owner** must provide **automatic under-frequency load shedding** block **demand** profile information to the **system operator** if reasonably requested by the **system operator**. For each North Island **connected asset owner** that information must be in the form, and supplied by the date, specified by the **system operator** in the **AUFLS technical requirements report**. For each South Island **grid owner** that information must be in the form specified by the **system operator** in the relevant **asset capability statement**.
- (9A) If requested by the **Authority**, the **system operator** must provide information it obtains under clauses 6 and 7 of Appendix B of **Technical Code A** and subclause (9) of this clause to the **Authority**, supplemented by the **system operator's** assessment, based on its analysis of that information, as to whether the **automatic under-frequency load shedding** scheme is secure.
- (10) Subclauses (12) to (16) apply if a direction under clause 9.15 is in force.
- (11) When subclauses (12) to (16) apply, the **system operator** may give notice to 1 or more of the **participants** specified in subclause (14), specifying modifications to the extent to which subclauses (1) to (4), (6), (6AA) and (6A) apply to the **participant** during any 1 or more periods, or in any 1 or more circumstances, specified in the notice.
- (12) The **system operator** must keep a record of each notice given under subclause (11).
- (13) When a notice under subclause (11) is in force in relation to a **participant**, the requirements of subclauses (1) to (4), (6), (6AA) and (6A) are modified for that **participant** to the extent, and during the periods, or in the circumstances (as the case may be), specified in the notice.
- (14) The participants to whom the **system operator** may issue a notice in accordance with subclause (11) are—
- (a) **connected asset owners** in the North Island;
 - (b) **grid owners** in the South Island.
- (15) The **system operator** may amend or revoke a notice, or revoke and substitute a new notice.
- (16) A notice under subclause (11) expires on the earlier of—
- (a) the date (if any) specified in the notice for its expiry;
 - (b) the revocation or expiry of the direction referred to in subclause (10).
- (17) The **system operator**, each **connected asset owner**, each **grid owner** and each relevant **retailer** must, to the extent reasonably practicable, co-operate to ensure that any **interruptible load** contracted by the **system operator** that could affect the size of an **automatic under-frequency load shedding** block is identified to assist the **connected asset owner** or the **grid owner** to meet its obligations in subclauses (1) to (9).
- (18) On the operation of an **automatic under-frequency load shedding** system, the **connected asset owner** or **grid owner**—
- (a) must, as soon as practicable, advise the **system operator** of the operation of the **automatic under-frequency load shedding** system and, if reasonably required

- by the **system operator** to plan to comply, or to comply, with its **principal performance obligations**, a reasonable estimate of the amount of **demand** that has been **electrically disconnected**; and
- (b) may **electrically connect the demand electrically disconnected** through the **automatic under-frequency load shedding** system only when permitted to do so by the **system operator**; and
 - (c) must ensure **demand electrically connected** in accordance with paragraph (b) complies with subclauses (6), (6AA) and (6A); and
 - (d) must report to the **system operator** if demand is moved between **points of connection**; and
 - (e) may request permission to **electrically connect demand** from the **system operator** if no instruction to **electrically connect demand** is received from the **system operator** within 15 minutes of the frequency returning to the **normal band**; and
 - (f) may cautiously and gradually **electrically connect the demand electrically disconnected** through the **automatic under-frequency load shedding** system if there is a **loss of communication**, after 15 minutes of the **loss of communication** occurring. This restoration must be done only while the frequency is within the **normal band** and the voltage is within the required range. Each **connected asset owner** must immediately cease the restoration of **demand** and, to the extent necessary, **electrically disconnect demand**, if the frequency drops below the **normal band** or the voltage moves outside the required range. As soon as practicable after communications are restored, each **connected asset owner** or each **grid owner** must report to the **system operator** on the status of load restoration and the status of re-arming the **automatic under-frequency load shedding** system; and
 - (g) must provide data detailing the **automatic under-frequency load shedding** system operation as detailed in the **AUFLS technical requirements report** or in a format agreed with the **system operator**.
- (19) Each **connected asset owner** must maintain an up-to-date process for the **electrical disconnection of demand for points of connection**, including the specification of the **participant** who will effect the **electrical disconnection of demand**. The **connected asset owner** must obtain agreement for the process from the **system operator** and each **grid owner** (such agreement not to be unreasonably withheld). Each **connected asset owner** must advise the **system operator** of the agreed process in addition to any changes to a process previously advised.
- (20) If the **system operator** requires the **electrical disconnection of demand** in accordance with this **Technical Code**, the **system operator** must instruct **connected asset owners** and **grid owners** (as the case may be) in accordance with the agreed process in subclause (19) to **electrically disconnect demand** for the relevant **point of connection**. If the **system operator** and a **connected asset owner** or **grid owner** (as the case may be) have not agreed on a process for **electrical disconnection of demand** for a **point of connection**, the **system operator** must instruct **grid owners** to **electrically disconnect demand** directly at the relevant **point of connection**. To the extent practicable, the

system operator must use reasonable endeavours to ensure equity between **connected asset owners** when instructing the **electrical disconnection of demand**.

- (21) Each **connected asset owner** or **grid owner** must act as instructed by the **system operator** operating in accordance with clauses 6 and 7.

Compare: Electricity Governance Rules 2003 clause 6 technical code B schedule C3 part C

Clause 7: substituted, on 7 August 2014, by clause 21 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Clause 7: replaced, on 21 December 2021, by clause 25 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

Clause 7(2): amended, on 19 December 2014, by clause 15 of the Electricity Industry Participation Code Amendment (Minor Code Amendments) (No 3) 2014.

Clause 7(2): amended, on 5 October 2017, by clause 125 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 7(9A) and (9B): inserted, from 3 January 2013 to 2 October 2013, by clause 4(a) of the Electricity Industry Participation (Automatic Under-Frequency Load Shedding Systems) Code Amendment 2012.

Clause 7(9A) and (9B): inserted, on 2 October 2013, by clause 4(a) of the Electricity Industry Participation (Automatic Under-Frequency Load Shedding Systems) Code Amendment 2013.

Clause 7(9A) and (9B): revoked, on 3 April 2014, by clause 5(a) of the Electricity Industry Participation (Automatic Under-Frequency Load Shedding Systems) Code Amendment 2013.

Clause 7(10): revoked, from 3 January 2013 to 2 October 2013, by clause 4(b) of the Electricity Industry Participation (Automatic Under-Frequency Load Shedding Systems) Code Amendment 2012.

Clause 7(10): revoked, on 2 October 2013, by clause 4(b) of the Electricity Industry Participation (Automatic Under-Frequency Load Shedding Systems) Code Amendment 2013.

Clause 7(10): inserted, on 3 April 2014, by clause 5(b) of the Electricity Industry Participation (Automatic Under-Frequency Load Shedding Systems) Code Amendment 2013.

Clause 7(11): amended, from 3 January 2013 to 2 October 2013, by clause 4(c) of the Electricity Industry Participation (Automatic Under-Frequency Load Shedding Systems) Code Amendment 2012.

Clause 7(11): amended, on 2 October 2013, by clause 4(c) of the Electricity Industry Participation (Automatic Under-Frequency Load Shedding Systems) Code Amendment 2013.

Clause 7(11): amended, on 3 April 2014, by clause 5(c) of the Electricity Industry Participation (Automatic Under-Frequency Load Shedding Systems) Code Amendment 2013.

Clause 7(12A) and (12B): inserted, from 3 January 2013 to 2 October 2013, by clause 4(d) of the Electricity Industry Participation (Automatic Under-Frequency Load Shedding Systems) Code Amendment 2012.

Clause 7(12A) and (12B): inserted, on 2 October 2013, by clause 4(d) of the Electricity Industry Participation (Automatic Under-Frequency Load Shedding Systems) Code Amendment 2013.

Clause 7(12A) and (12B): revoked, on 3 April 2014, by clause 5(d) of the Electricity Industry Participation (Automatic Under-Frequency Load Shedding Systems) Code Amendment 2013.

Clause 7(13): amended, from 3 January 2013 to 2 October 2013, by clause 4(e) of the Electricity Industry Participation (Automatic Under-Frequency Load Shedding Systems) Code Amendment 2012.

Clause 7(13): amended, on 2 October 2013, by clause 4(e) of the Electricity Industry Participation (Automatic Under-Frequency Load Shedding Systems) Code Amendment 2013.

Clause 7(13): amended, on 3 April 2014, by clause 5(e) of the Electricity Industry Participation (Automatic Under-Frequency Load Shedding Systems) Code Amendment 2013.

Clause 7(15): amended, from 3 January 2013 to 2 October 2013, by clause 4(f) of the Electricity Industry Participation (Automatic Under-Frequency Load Shedding Systems) Code Amendment 2012.

Clause 7(15): amended, on 2 October 2013, by clause 4(f) of the Electricity Industry Participation (Automatic Under-Frequency Load Shedding Systems) Code Amendment 2013.

Clause 7(15): amended, on 3 April 2014, by clause 5(f) of the Electricity Industry Participation (Automatic Under-Frequency Load Shedding Systems) Code Amendment 2013.

Clause 7(16): substituted, from 3 January 2013 to 2 October 2013, by clause 4(g) of the Electricity Industry Participation (Automatic Under-Frequency Load Shedding Systems) Code Amendment 2012.

Clause 7(16): substituted, on 2 October 2013, by clause 4(g) of the Electricity Industry Participation (Automatic Under-Frequency Load Shedding Systems) Code Amendment 2013.

Clause 7(16): substituted, on 3 April 2014, by clause 5(g) of the Electricity Industry Participation (Automatic Under-Frequency Load Shedding Systems) Code Amendment 2013.

Clause 7(16A) and (16B): inserted, from 3 January 2013 to 2 October 2013, by clause 4(g) of the Electricity Industry Participation (Automatic Under-Frequency Load Shedding Systems) Code Amendment 2012.

Clause 7(16A) and (16B): inserted on 2 October 2013, by clause 4(g) of the Electricity Industry Participation (Automatic Under-Frequency Load Shedding Systems) Code Amendment 2013.

Clause 7(16A) and (16B): revoked on 3 April 2014, by clause 5(g) of the Electricity Industry Participation (Automatic Under-Frequency Load Shedding Systems) Code Amendment 2013.

7A *[Revoked]*

Clause 7A: inserted, on 7 August 2014, by clause 21 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Clause 7A(1), (2), (5), (6) and (7): amended, on 5 October 2017, by clause 126 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 7A(1), (3), (4), (5), (6), (7) and (8): amended, on 1 February 2016, by clause 20 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Clause 7A: revoked, on 21 December 2021, by clause 26 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

7B *[Revoked]*

Clause 7B: inserted, on 7 August 2014, by clause 21 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Clause 7B: amended, on 5 October 2017, by clause 127 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 7B: revoked, on 21 December 2021, by clause 27 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

7C *[Revoked]*

Clause 7C: inserted, on 7 August 2014, by clause 21 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Clause 7C(5)(a): amended, on 1 February 2016, by clause 21 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Clause 7C: revoked, on 21 December 2021, by clause 28 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

8 Obligations of grid owners

- (1) A **grid owner** must use reasonable endeavours to ensure that appropriate **assets** are installed for the manual **electrical disconnection of demand** at **points of connection**.
- (2) A **grid owner** must take independent action as may be required by the **system operator** in accordance with clause 6(4), to **electrically disconnect demand** at **points of connection** when any **grid** voltage reaches the minimum voltage limit set out in the table contained in clause 8.22(1) and is sustained at or below that level. A **grid owner** must continue to **electrically disconnect demand** at **points of connection** while the voltage remains below that minimum voltage limit, being guided by any arrangements with **connected asset owners** as advised by the **system operator**.

Compare: Electricity Governance Rules 2003 clause 7 technical code B schedule C3 part C

Clause 8(2): amended, on 1 February 2016, by clause 22 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Clause 8(1) and (2): amended, on 5 October 2017, by clause 128(1) and (2) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

9 Obligations of generators and ancillary service agents to take independent action

The following independent action is required of **generators** and **ancillary service agents** during the occurrence of extreme variations of frequency or voltage at the **points of connection** to which their **assets** are connected (such extreme levels of frequency or voltage are deemed to constitute a **grid emergency** and require a fast and independent response from each **generator** and each **ancillary service agent**):

- (a) when the **under-frequency limit** is reached and the frequency continues to fall, each **generator** must use reasonable endeavours to take the following immediate independent action to assist in restoring frequency:
 - (i) increase the energy **injection** from each **generating unit** that is physically

- capable of increasing such **injection**:
- (ii) attempt to restore **grid** frequency to the **normal band** by **synchronising** and loading each **generating unit** that is not **electrically connected** but is able to be **electrically connected** and operated in this manner:
 - (iii) **re-synchronise** and load each **generating unit** that has tripped and is able to be **electrically connected** and operated in this manner:
 - (iv) report to the **system operator** as soon as practicable after taking action in accordance with subparagraphs (i) to (iii):
- (b) when the **over frequency limit** is reached and the frequency continues to rise, each **generator** must use reasonable endeavours to take the following immediate independent action to assist in restoring frequency:
- (i) decrease the energy injection from **electrically connected generating units** if the **generator** is physically capable of decreasing such **injection**:
 - (ii) report to the **system operator** as soon as practicable after taking action in accordance with subparagraph (i):
- (c) when either the minimum voltage limit or the maximum voltage limit set out in the table contained in clause 8.22(1) is exceeded at any **point of connection**:
- (i) **generators** and **ancillary service agents** must use reasonable endeavours to take immediate independent action to return the voltage to, as close as practicable, within such limits:
 - (ii) each **generator** must use reasonable endeavours to **synchronise** and, as necessary, load and adjust all available **generating units** that can assist in restoring the voltage:
 - (iii) **ancillary service agents** must use reasonable endeavours to **electrically connect** to the **grid** and, as necessary, load all available **reactive capability** resources, that can assist in restoring the voltage:
 - (iv) as soon as practicable after taking the actions described in subparagraphs (i) to (iii), each **generator** and **ancillary service agent** must report to the **system operator** on the action taken to correct voltage:
- (d) for a **loss of communication** with the **system operator**, lasting at least 5 minutes, each **generator** must use reasonable endeavours to—
- (i) for **synchronised generating units**, take independent action to adjust supply to maintain frequency as close as possible to the **normal band**, and maintain voltage as close as possible either to that previously advised by the **system operator**, or as can be best established by the **generator**; and
 - (ii) **synchronise** available **generating units** to the **grid** if the **generating units** currently **electrically connected** do not have the capacity to control the frequency and voltage as required by paragraph (e)(i); and
 - (iii) continue to attempt to maintain the frequency and voltage to meet the requirements of paragraph (e)(i); and
 - (iv) as soon as practicable after communications are restored, report to the **system operator** on the action taken:
- (e) for a **loss of communication** with the **system operator** lasting at least 5 minutes, **ancillary service agents** must use reasonable endeavours to—
- (i) if on load, take independent action to adjust any real or **reactive power**

resources to maintain frequency and voltage as close as possible either to that previously advised by the **system operator** or as can be best established by the **ancillary service agent**; and

- (ii) **electrically connect** available **reactive capability** resources to the **grid** if the currently **electrically connected reactive power** resources do not have the capacity to control the voltage above the minimum limit set out in the table contained in clause 8.22(1); and
 - (iii) continue to attempt to maintain the voltage above the minimum limit set out in the table contained in clause 8.22(1); and
 - (iv) as soon as practicable after communications are restored, report to the **system operator** on the action taken:
- (f) in the event of a failure at the **system operator's** operational centre that disables the main **dispatch** or communication systems, the **system operator** may temporarily transfer its operational activities to an alternative operational centre. If the **system operator** makes such a transfer, the **system operator** must:
- (i) arrange for communication facilities to transfer to the new location; and
 - (ii) give written notice to **participants** of those arrangements.

Compare: Electricity Governance Rules 2003 clause 8 technical code B schedule C3 part C

Clause 9: amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

Clause 9: amended, on 5 October 2017, by clause 129 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 9(c): replaced, on 20 December 2021, by clause 18(1) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2019.

Clause 9(f): replaced, on 20 December 2021, by clause 18(2) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2019.

Technical Code C – Operational communications

1 Purpose

The purpose of this **technical code** is to state the minimum requirements for the communications required under this Code between **asset owners**, except owners of **excluded generating stations**, and the **system operator**, in order to assist the **system operator** to plan to comply, and to comply, with the **principal performance obligations**. Additional requirements may be set out in other clauses. This **technical code** does not deal with the content of communications, which is dealt with in each **technical code** and in Part 13 where relevant.

Compare: Electricity Governance Rules 2003 clause 1.1 technical code C schedule C3 part C

2 Application

This **technical code** applies to the **system operator** and to all **asset owners** except owners of **excluded generating stations**. If the **system operator** reasonably considers it necessary to assist the **system operator** in planning to comply, and complying, with the **principal performance obligations**, the **system operator** may require that an **excluded generating station** comply with some or all of the requirements of this **technical code**.

Compare: Electricity Governance Rules 2003 clause 1.2 technical code C schedule C3 part C

3 General requirements for operational communications

- (1) Each voice or electronic communication between the **system operator** and an **asset owner** must be logged by the **system operator** and the **asset owner**. Unless otherwise agreed between the **system operator** and the **asset owner**, every voice instruction must be repeated back by the person receiving the instruction and confirmed by the person giving the instruction before the instruction is actioned.
- (2) The **system operator** and each **asset owner** must nominate and advise each other of the preferred points of contact and the alternative points of contact to be used by the **system operator** and the **asset owner**. Each **asset owner** must also nominate and advise the **system operator** of the person to receive instructions and **formal notices** as set out in **Technical Code B**. The preferred points of contact must include those to be used when the **system operator** instructs the **asset owner**, when the **system operator** sends **formal notices** to the **asset owner** and when the **asset owner** contacts the **system operator**. The alternative points of contact must be used only if the preferred points of contact are not available.
- (3) The **grid owner** and each other **asset owner** must nominate and advise each other of the preferred points of contact and the alternative points of contact to be used by the **grid owner** and the other **asset owner** for the purpose of communications regarding the availability of the **grid owner's** data transmission communications. The alternative points of contact must only be used if the preferred points of contact are not available.

Compare: Electricity Governance Rules 2003 clause 2 technical code C schedule C3 part C

4 Specific requirements for voice communication

- (1) Each **asset owner** must have in place a primary means of communicating by voice between the **control room** of the **asset owner** and the **system operator**. The primary means of voice communication must use either—
 - (a) the **grid owner's** speech network; or
 - (b) a widely available public switched telephone network that operates in real time and in full duplex mode.
- (2) Each **asset owner** must have in place a backup means of communicating by voice between the **control room** of the **asset owner** and the **system operator**. The backup means of voice communication—
 - (a) must be approved by the **system operator** (such approval not to be unreasonably withheld); and
 - (b) may include, but is not limited to, satellite phone or cellular phone; and
 - (c) may be used only if the primary means of voice communication described in subclause (1) is unavailable or otherwise with the agreement of the **system operator**.
- (3) An **asset owner** who has a **control room** with, at any time, operational control of more than 299 MW of **injection, offtake**, or power flow must have 2 or more back up means of voice communication between the **control room** of the **asset owner** and the **system operator**, each of which must meet the requirements of subclause (2).

Compare: Electricity Governance Rules 2003 clause 3 technical code C schedule C3 part C

5 Specific requirements for transmitting information

- (1) Each **asset owner** must transmit information between its **control room** and the **system operator** in writing.
- (2) Despite subclause (1), an **asset owner** may request the **system operator** to approve an alternative means of transmitting information (such approval not to be unreasonably withheld).
- (3) Each **asset owner** must have in place a backup means of transmitting information. The backup means of transmitting information—
 - (a) must be approved by the **system operator** (such approval not to be unreasonably withheld); and
 - (b) may include, but is not limited to, voice communication or email; and
 - (c) may only be used if the primary means of transmitting information described in subclause (1) or (2) is unavailable or otherwise with the agreement of the **system operator**.

Compare: Electricity Governance Rules 2003 clause 4 technical code C schedule C3 part C

Heading: amended, on 5 October 2017, by clause 130(1) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 5(1): replaced, on 5 October 2017, by clause 130(2) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 5(2) and (3): amended, on 5 October 2017, by clause 130(3) and (4) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

6 Specific requirements for data transmission communication

- (1) Each **asset owner** (other than a **grid owner**) must have in place—
 - (a) a primary means of transmitting data between the **assets** of the **asset owner** and a **SCADA** remote terminal unit of a **grid owner**; or
 - (b) if approved by the **system operator** (such approval not to be unreasonably withheld), a primary means of transmitting data between the **assets** of the **asset owner** and the **system operator**.
- (2) A **grid owner** must have in place a primary means of transmitting data between the **assets** of the **grid owner** and the **system operator**.
- (3) Each **asset owner** must have in place a backup means of transmitting data for each type of indication and measurement specified in Appendix A of this **technical code**. The backup means of data transmission communication—
 - (a) must be approved by the **system operator** (such approval not to be unreasonably withheld); and
 - (b) may include, but is not limited to, use of voice communication or document transmission communication; and
 - (c) may only be used if the primary means of data transmission communication described in subclause (1) or (2) is unavailable or otherwise with the agreement of the **system operator**.

Compare: Electricity Governance Rules 2003 clause 5 technical code C schedule C3 part C

7 Availability of primary means of communication

- (1) Each **asset owner** must use reasonable endeavours to ensure that the primary means of communication described in clauses 4(1), 5(1) or (2), and 6(1) or (2) is available continuously.
- (2) If the primary means of communication described in clauses 4(1), 5(1) or (2), and 6(1) or (2) is unavailable, an **asset owner** must use reasonable endeavours to restore availability of the primary means of communication as soon as practicable.

Compare: Electricity Governance Rules 2003 clause 6 technical code C schedule C3 part C

8 Notice of planned outages of primary means of communication

Each **asset owner** must give written notice to the **system operator** of any planned outage of a primary means of communication described in clauses 4(1), 5(1) or (2), and 6(1) or (2).

Compare: Electricity Governance Rules 2003 clause 7 technical code C schedule C3 part C

Clause 8 heading: amended, on 1 November 2018, by clause 16 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2018.

Clause 8: amended, on 5 October 2017, by clause 131 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

9 Performance requirements for indications and measurements

- (1) Each **asset owner** must provide the relevant indications and measurements shown in Appendix A to the **system operator**, in accordance with clause 6. The **system operator** may require the **asset owner** to provide additional information if, in the reasonable opinion of the **system operator**, such information is required for the **system operator** to plan to comply, and to comply, with its **principal performance obligations**.

- (2) The **asset owner** must use reasonable endeavours to ensure that the accuracy of the measurements it provides to the **system operator** in accordance with subclause (1) complies with Appendix A.
- (3) Each indication and measurement provided in accordance with subclause (1) must be updated at the **grid owner's SCADA** remote terminal or the **system operator's** interface unit at least once every 8 seconds when provided by the primary means of data transmission communications.

Compare: Electricity Governance Rules 2003 clause 8 technical code C schedule C3 part C

*Appendix A: Indications and Measurements
(Clause 9(1)-(3) of Technical Code C)*

Table A1: Requirements of generators

Each **generator** must provide the indications and measurements in Table A1. If net (or gross) measurements are required in Table A1, the use of **scaling factors** together with the provision of the relevant gross (or net) values is acceptable with the **system operator's** approval. Each **generator** must provide **scaling factors** to the **grid owner** so that the **grid owner** can apply the adjustment at the **SCADA** server.

Indication or measurement	Values required	Accuracy ³
Station net MW	Import and export	±2%
Generating unit gross MW ¹	Import and export, for each generating unit	±2%
Station net Mvar	Import and export	±2%
Generating unit gross Mvar ¹	Import and export, for each generating unit	±2%
Generating unit circuit breaker status ¹	Open /closed /in transition/ indication error ²	N/A
Grid interface circuit breaker status	Open /closed /in transition/ indication error ²	N/A
Grid interface disconnecter status	Open /closed /in transition/ indication error	N/A
Special protection scheme status	Enabled/disabled/summer/winter	N/A
Maximum output capacity of generating station (for intermittent generators only)	Number of connected generating units × MW capability of each generating unit	N/A

Compare: Electricity Governance Rules 2003 table A1 appendix A technical code C schedule C3 part C

Table A1: amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

Table A1: amended, on 5 October 2017, by clause 132 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Table A2: Requirements of grid owners:

Each **grid owner** must provide the indications and measurements shown in Table A2 in respect of **assets** connected to, or forming part of, the **grid**.

Indication or measurement	Values required	Accuracy ³
Grid interface circuit breaker status	Open /closed /in transition/ indication error ²	N/A
Grid interface disconnecter status	Open/ closed/ in transition/ closed to earth/ indication error	N/A
Grid interface auto reclose status	Enabled/disabled/ operated/locked out	N/A
Grid interface MW	Import and export	±2%

Indication or measurement	Values required	Accuracy ³
Grid interface Mvar	Import and export	±2%
Circuit Amps	Current at each termination point of a circuit	N/A
Circuit MW	MW at each termination point of a circuit	N/A
Circuit Mvar	Mvar at each termination point of a circuit	N/A
Tap positions for interconnecting transformers and supply transformers with on-load tap changers	Tap position for all windings including tapped tertiaries	N/A
Tap positions for interconnecting transformers and supply transformers with off-load tap changers ⁴	Tap position for all windings including tapped tertiaries	N/A
Reactive plant (eg RPC equipment, capacitor, reactor, condenser) Mvar	Import and export	±2%
Bus voltage	kV	±2%
Special protection scheme status	Enabled/disabled/summer/winter	N/A
HVDC modulation status	Frequency stabiliser/ spinning reserve sharing/ Haywards frequency control/ AC transient voltage support	N/A

Compare: Electricity Governance Rules 2003 table A2 appendix A technical code C schedule C3 part C
Table A2: amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

Table A2: amended, on 5 October 2017, by clause 133 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Table A2: amended, on 20 December 2021, by clause 19 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2019.

Table A3: Requirements of connected asset owners

Each **connected asset owner** must provide the indications and measurements shown in Table A3 in respect of **assets** connected to, or forming part of, the **grid**.

Indication or measurement	Values required	Accuracy ³
Grid interface circuit breaker status	Open/ closed/ in transition/ indication error ²	N/A
Grid interface disconnecter status	Open/ closed/ in transition/ indication error	N/A
Grid interface auto reclose status	Enabled/disabled/operated/locked out	N/A
Special protection scheme status	Enabled/disabled/summer/winter	N/A
Reactive plant ⁵ (eg RPC equipment, capacitor, reactor, condenser) Mvar	Import and export	±2%

Table A3 Heading: amended, on 1 February 2016, by clause 23(1) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Table A3: amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

Table A3: amended, on 1 February 2016, by clause 23(2) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Table A3: amended, on 5 October 2017, by clause 134 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

- ¹ Required only if a **generating unit** has a maximum continuous rating of greater than 5 **MW**.
- ² No intentional time delays should be included for **circuit breaker** indications as these are time tagged by the **system operator** to less than 10 ms.
- ³ If accuracy is measured at the input terminal of the RTU of the **grid owner**, under normal operating conditions at full scale.
- ⁴ Indication required within 5 minutes of status change.
- ⁵ Required only if reactive plant has a maximum continuous rating of greater than 5 Mvar.

Compare: Electricity Governance Rules 2003 table A3 appendix A technical code C schedule C3 part C

Technical Code D – Co-ordination of outages affecting common quality

1 Purpose

The purpose of this **technical code** is to set out the obligations of **asset owners** to give written notice of planned outages of **assets** that affect **common quality**, and to set out the obligations of the **system operator** in relation to outage co-ordination and the provision of timely advice to **asset owners** on the security implications of **notified planned outages**.

Compare: Electricity Governance Rules 2003 clause 1 technical code D schedule C3 part C
Clause 1: amended, on 5 October 2017, by clause 135 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

2 Notice of planned outages

- (1) Each **asset owner** must, in relation to each of its **assets**, give written notice to the **system operator** as soon as practicable of all planned outages of such **assets** if such outages may impact on the **system operator's** ability to plan to comply, and to comply, with the **principal performance obligations**.
- (2) If the **asset owner** is unsure whether an outage of an **asset** may impact on the **system operator's** ability to plan to comply, and to comply, with the **principal performance obligations**, the **asset owner** must contact the **system operator** for advice.
- (3) Each **asset owner** must give written notice to the **system operator** up to 12 months ahead of planned outages and update the **system operator** of changes to the planned outages as and when the **asset owner** becomes aware of them.

Compare: Electricity Governance Rules 2003 clause 2 technical code D schedule C3 part C
Heading: amended, on 5 October 2017, by clause 136(1) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.
Clause 2(1) and (3): amended, on 5 October 2017, by clause 136(2) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

3 Assessment of notified planned outages

The **system operator** must assess all **notified planned outages** and the extent to which they impact on the **system operator's** ability to plan to comply, and to comply with the **principal performance obligations**.

Compare: Electricity Governance Rules 2003 clause 3 technical code D schedule C3 part C

4 Assets may be requested to remain in service

The **system operator** may request that an **asset owner** of **assets** that are the subject of a **notified planned outage** keep those **assets** in service until a more suitable time, if such outage would, in the reasonable opinion of the **system operator**, adversely affect the **system operator's** ability to plan to comply, and to comply, with the **principal performance obligations**. The **system operator** may propose a suitable alternative time for the **notified planned outage**.

Compare: Electricity Governance Rules 2003 clause 4 technical code D schedule C3 part C

5 Asset owners to assist security

- (1) An **asset owner** must endeavour to programme its **notified planned outage** at a time when there will be no disruption to the **system operator's** ability to plan to comply, and

to comply, with the **principal performance obligations**.

- (2) The **system operator** may advise an **asset owner** when an appropriate time would be.
- (3) If an **asset owner** is able to modify the **notified planned outage** period for an **asset** in the manner suggested by the **system operator** without material cost or disruption, the **asset owner** must endeavour to do so.

Compare: Electricity Governance Rules 2003 clause 5 technical code D schedule C3 part C

6 **Asset outage programme**

The **system operator** must regularly publish an **asset** outage programme containing all **notified planned outage** information provided by the **asset owners**.

Compare: Electricity Governance Rules 2003 clause 6 technical code D schedule C3 part C

7 **Assets may be requested to return to service**

The **system operator** may request an **asset owner** to terminate a **notified planned outage** in progress within a pre-arranged period so that **assets** that are the subject of the **notified planned outage** can be returned to service to support the **system operator** in planning to comply, and in complying, with the **principal performance obligations**.

Compare: Electricity Governance Rules 2003 clause 7 technical code D schedule C3 part C

Schedule 8.4
[Revoked]

cl 7.2

Compare: Electricity Governance Rules 2003 schedule C6 part C
Schedule 8.4: revoked, on 19 May 2016, by clause 30 of the Electricity Industry Participation Code Amendment (System Operator and Alignment with Statutory Objective) 2016.

Schedule 8.5
[Revoked]

cl 8.54D(7), 8.54E(4)(b), 8.54F(2)(b)(ii),
8.54G(4), 8.54I(2), 8.54J(8), (9)

Schedule 8.5: inserted, on 7 August 2014, by clause 22 of the Electricity Industry Participation Code Amendment (Extended Reserve) 2014.

Schedule 8.5: revoked, 21 December 2021, by clause 29 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

Schedule 8.6

cl 1.1

AUFLS technical requirements report incorporated by reference

Schedule 8.6: inserted, 21 December 2021, by clause 30 of the Electricity Industry Participation Code Amendment (Automatic Under-Frequency Load Shedding Systems) 2021.

Schedule 8.6 Heading: amended, on 1 August 2023, by clause 29 of the Electricity Industry Participation Code Amendment (System Operation Documents) 2023.

1 *[Revoked]*

Clause 1: revoked, on 1 August 2023, by clause 30 of the Electricity Industry Participation Code Amendment (System Operation Documents) 2023.

2 **Incorporation of AUFLS technical requirements report by reference**

(1) **The AUFLS technical requirements report** is incorporated by reference in this Code.

(2) Clauses 7.13 to 7.22 apply to any amendment or replacement of the **AUFLS technical requirements report**.

Clause 2(1): amended, on 1 August 2023, by clause 31(1) of the Electricity Industry Participation Code Amendment (System Operation Documents) 2023.

Clause 2(2): amended, on 1 August 2023, by clause 31(2) of the Electricity Industry Participation Code Amendment (System Operation Documents) 2023.

Clause 2(2): amended, on 1 March 2024, by clause 32 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2024

3 *[Revoked]*

Clause 3: revoked, on 1 August 2023, by clause 32 of the Electricity Industry Participation Code Amendment (System Operation Documents) 2023.

4 *[Revoked]*

Clause 4: revoked, on 1 August 2023, by clause 33 of the Electricity Industry Participation Code Amendment (System Operation Documents) 2023.

5 *[Revoked]*

Clause 4: revoked, on 1 August 2023, by clause 34 of the Electricity Industry Participation Code Amendment (System Operation Documents) 2023.