

Security of Supply Forecasting and Information Policy

Effective Date: To be confirmed

1. Background

- 1.1 This Policy sets out the **system operator's** policy on information and forecasting for New Zealand and South Island security of supply. Security of supply in the context of this Policy is the New Zealand power system's present and future ability to meet electricity demand at a national and South Island level.
- 1.2 The **system operator's** principal objective under this Policy is to ensure, to the extent possible, the provision of high-quality security of supply related information to all interested parties.
- 1.3 Part 7 of the **Code** sets out the **system operator's** obligation to prepare and publish the **security of supply forecasting and information policy** and the **emergency management policy**. Part 9 of the **Code** sets out the system operator's obligation to prepare and publish the **system operator rolling outage plan** and the system operator may request specified participants to develop a participant rolling outage plan. Part 9 also sets out the circumstances when the system operator must commence an **official conservation campaign**. Together, these policies and obligations relate to managing an **extended emergency** in which the ability of the power system to meet demand over an extended period of time is at risk.

2. Glossary

- 2.1 In this Policy, unless the context otherwise requires—

alert status curve means the 4% **electricity risk curve**

Authority means the Electricity Authority

available hydro storage means hydro storage, including **contingent hydro storage** whether currently available or not, that, in the **system operator's** reasonable opinion, is controllable and available for generation of electricity from—

- (a) Lakes Tekapo, Pukaki, Te Anau, Hawea and Manapouri for the South Island; and
- (b) Lakes Taupo, Tekapo, Pukaki, Te Anau, Hawea and Manapouri for New Zealand; and
- (c) any other lakes the **system operator** decides to include under clause 5.1A of this Policy

Code means the Electricity Industry Participation Code 2010

contingent hydro storage means the additional hydro storage that becomes available for generation at a **contingent storage release boundary**

contingent storage release boundary means an **electricity risk curve** representing a level of risk of future shortage at which a resource consent grants the consent holder access to additional hydro storage

contingent storage release information means information about the **contingent hydro storage** currently available for generation

CSRB buffer discretion process means the process followed by the system operator to determine whether and how it may exercise its discretion under clause 6.1A(c)

electricity risk curve means the New Zealand or South Island hydro storage level over a calendar year that represents a specific, quantified level of risk of future shortage determined by factoring in all **available hydro storage**, which may include a floor under clause 6.1A

electricity risk curve disclosure information, in relation to a participant, means information that –

- (a) is about the **participant**; and
- (b) is held by the **participant**; and
- (c) the **participant** expects, or ought reasonably to expect, will, or is likely to have a material impact on the **electricity risk curve** inputs and assumptions **published** made publicly available by the **system operator**

electricity risk meter status curves means the **watch status curve** and the **alert status curve**

emergency status curve means the **electricity risk curve** showing the level of storage at which an **official conservation campaign** would be commenced under clause 9.23 of the **Code**

extended emergency has the meaning given to it in the **emergency management policy**

formal agreement means a binding agreement that enables a response such as:

- (a) increased electricity generation due to a reallocation of gas; or
- (b) electricity demand to be reduced.

The following information related to the response should be included in the agreement:

- (a) maximum quantity of increased electricity generation and/or electricity demand reduction (TJ per day or MWh per day);
- (b) duration of the response (days);
- (c) under what conditions the response could be activated, including any options for parties to activate the response; and
- (d) how the response is linked to an **official conservation campaign**.

Where there is any doubt as to whether an agreement is a **formal agreement** for the purposes of this policy, the **system operator** shall have the final determination

inflows mean the hydrological inflows into—

- (a) Lakes Tekapo, Pukaki, Te Anau, Hawea and Manapouri for the South Island; and
- (b) Lakes Taupo, Tekapo, Pukaki, Te Anau, Hawea and Manapouri for New Zealand; and
- (c) any other lakes the system operator decides to include under clause 5.1A of this Policy

SOSA means the Annual Security of Supply Assessment referred to in clause 7.3(1)(a)(i) of the **Code**

thermal fuel validation methodology means the process followed by the **system operator** to evaluate restrictions on thermal fuel availability, as it relates to the **electricity risk curve** inputs and assumptions ~~published~~~~made publicly available~~ by the **system operator**

~~type 1 response~~ means ~~a participant~~ market response, ~~resulting in increased electricity generation (due to reallocation of gas from industrial users) that can occur within 4 weeks~~ which:

- ~~(a) the system operator has been made aware of; or~~
- ~~(b) has been identified through historical observation(s);~~

~~and in each case the system operator reasonably believes is still applicable.~~

~~Where there is any doubt as to whether a response is a Type 1 response or the impact of the Type 1 response in terms of increased electricity generation or reduced demand, the system operator shall have the final determination~~

~~type 2 response~~ means ~~a participant~~ response which the system operator has been made aware of that is supported by a **formal agreement(s)** resulting in increased electricity generation (due to reallocation of gas from industrial users)

watch adder means 200 GWh unless the **system operator** determines a different value and **publishes it**

watch status curve means the higher of:

- (a) the 1% electricity risk curve; and
- (b) the alert status curve plus the larger of:
 - (i) the watch adder; and
 - (ii) the largest fall in available hydro storage the system operator simulates for the month in which the watch status curve is published

2.2 References in this Policy to “energy”, “supply”, “demand”, “generation”, “capacity” and “shortage” are references to electrical energy, the supply of electricity, the demand for electricity, the generation of electricity, the capacity to generate electricity and the shortage of electricity.

2.3 *Revoked*

2.3A Each requirement in this Policy relating to **available hydro storage, electricity risk curves, electricity risk meter status** and simulated storage trajectories applies separately to New Zealand and the South Island.

2.4 ~~Revoked~~~~An obligation of the system operator under this Policy to make information publicly available may be satisfied by the system operator publishing the information on the system operator section of the Transpower website.~~

- 2.5 Any term in bold that is defined in the **Code** and used but not defined in this Policy has the same meaning as in the **Code**.

3. Confidential information and forecasts

- 3.1 Nothing in this Policy requires the **system operator** to make available (publicly or otherwise) any information that is confidential to any person except as provided for in 3.3 below. However, the **system operator** may make confidential information available under this Policy in such a way that the subject of the confidential information cannot reasonably be ascertained.
- 3.2 In order to perform its obligations under this Policy the **system operator** is likely to be required to make projections about the future based on information that is historical, incomplete or not reasonably verifiable by the **system operator**. In making such projections the **system operator** is not obliged to do more than act as a reasonable and prudent **system operator** in accordance with clause 7.1A of the **Code**.
- 3.3 At the **Authority's** request, the **system operator** will provide all information it uses to perform its obligations under this policy, including confidential information, to the **Authority**. The **Authority** will only use confidential information for the purposes of monitoring the **system operator** and assuring itself and stakeholders that the system operator's outputs are accurate.

4. *Revoked*

5. Determining hydro storage

- 5.1 The **system operator** must determine **available hydro storage, contingent hydro storage and inflows** using reasonably reliable information that is known to the **system operator**.
- 5.1A The **system operator** may include any other lake in its determination of **available hydro storage, contingent hydro storage and inflows** for the South Island or New Zealand, in addition to those lakes named in paragraphs (a) and (b) of the definition of **available hydro storage and inflows**, if material and reasonably reliable information about the controllable and available hydro storage from that lake becomes known to the **system operator**. The **system operator** must ~~publish~~[make publicly available](#) any decision it makes to include a lake under this clause.
- 5.2 *Revoked*
- 5.3 The **system operator** must ~~publish~~[make publicly available](#) the inputs and assumptions it has used to determine **available hydro storage** and **contingent hydro storage**.

6. Determining the electricity risk curves

- 6.0 The **system operator** must determine and ~~publish~~[make publicly available](#) the **electricity risk curves** for the next calendar year on or before 30 April of the current calendar year.

6.1 The **electricity risk curves** must—

- (a) assume full availability of installed transmission and generation **assets**, unless reasonably reliable information is known to the **system operator** that indicates otherwise; and
- (aa) assume generation **assets** are not subject to constraints on the availability of thermal fuel, including delivery constraints, unless reasonably reliable information [about physical constraints](#) is known to the **system operator** that indicates otherwise. In making an assessment of reasonably reliable information the **system operator** will follow its **thermal fuel validation methodology**; and
- (ab) use a medium demand forecast; and
- (ac) ~~revoked in relation to reallocation of gas fuel from industrial users, only assume:~~
 - i ~~— Type 1 response(s) up to 620TJ per month of gas or 85GWh per month of electricity per response; and~~
 - ii ~~— Type 2 response(s) above 110TJ per month of gas or 15GWh per month of electricity per response; and~~
- (ad) in relation to electricity demand response, including the impact of distributed energy resources, use the **system operator's** experience and judgement to assess the amount of demand response. The assessment may include formal demand response contracts, historical observation, and information the **system operator** is aware of, but also includes modelling, forecast future demand response and any other demand response likely in the **system operator's** judgement; and
- (b) assume short-term market behaviour that seeks to minimise use of hydro storage; and
- (c) model the uncertainty of future inflows to hydro catchments using reasonably available historical records of those inflows; and
- (d) show the 1%, 4% and 10% risks of future shortage; and
- (da) show ~~the watch status curve, alert status curve and emergency status curve~~ the level of storage at which an ~~official conservation campaign~~ would be commenced under clause 9.23 of the **Code**; and
- (db) show the level of storage at which an **official conservation campaign** would be ended under clause 9.23A of the **Code**; and
- (e) show any other risk of future shortage that triggers the availability of **contingent hydro storage**.

6.1AA The **system operator** must determine and **publish** additional electricity risk curves that take into account reasonably reliable information known to the **system operator** about contract limits on the supply of thermal fuel, unless the **system operator** considers such additional electricity risk curves will not be materially different to the **electricity risk curves** published

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under clause 6.0 and updated under clause 6.4. The electricity risk curves the **system operator publishes** under this clause may relate to specific scenarios affecting thermal fuel supply. The **system operator** is not required to publish electricity risk curves under this clause for all scenarios affecting thermal fuel supply.

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6.1A If an **electricity risk curve** is a **contingent storage release boundary** or an **electricity risk meter status curve** then the **electricity risk curve** must include a floor equal to:

- (a) the amount of **contingent hydro storage** linked to the **electricity risk curve**; plus
- (b) the amount of **contingent hydro storage** linked to **electricity risk curves** representing higher levels of risk of future shortage (if any); plus
- (c) the relevant buffer in the following table of 50 GWh unless the **system operator** determines one or more different buffers and publishes them~~makes it publicly available.~~

<u>Month</u>	<u>Buffer (GWh)</u>
<u>Jan</u>	<u>140</u>
<u>Feb</u>	<u>140</u>
<u>Mar</u>	<u>140</u>
<u>Apr</u>	<u>140</u>
<u>May</u>	<u>160</u>
<u>Jun</u>	<u>250</u>
<u>Jul</u>	<u>310</u>
<u>Aug</u>	<u>330</u>
<u>Sep</u>	<u>350</u>
<u>Oct</u>	<u>140</u>
<u>Nov</u>	<u>140</u>
<u>Dec</u>	<u>140</u>

6.1BB The **system operator** must:

- (a) publish the CSR buffer discretion process; and

(b) use the published CSRB buffer discretion process if it determines and publishes one or more different buffers under clause 6.1A(c).

- 6.1B The buffer referred to in clauses 9.23(1)(ab)(ii) and 9.23(2)(ab)(ii) of the **Code** is 50 GWh unless the **system operator** determines one or more different buffers and makes-publishes them publicly-available.
- 6.1C The 'Alert' release boundary is modelled as a **contingent storage release boundary** that uses a risk of future shortage of 4% and is the subsequent equivalent regulatory arrangement to the use of 'Alert' status for the triggering of access to 'Alert' **contingent hydro storage**.
- 6.1D The 'Emergency' release boundary is modelled as a **contingent storage release boundary** that uses a risk of future shortage of 10%. The actual use of 'Emergency' **contingent hydro storage** is dependent on an **official conservation campaign** being commenced and/or other conditions noted in the resource consent granted to the hydro generator.
- 6.2 The **system operator** must publishmake publicly available the inputs and assumptions it has used to determine the **electricity risk curves**.
- 6.3 The **system operator** must review and, if necessary, update the inputs and assumptions it has used to determine the **electricity risk curves**—
- (a) when—
- (i) the **system operator** becomes aware of new reasonably reliable information that the **system operator** considers may yield a material change to the **electricity risk curves**; or
 - (ii) *revoked*
 - (iii) *revoked*
 - (iv) the **system operator** considers that a change to an electricity risk meter status is imminent; and
- (b) in any event, at least once per calendar month.
- 6.4 The **system operator** must change the **electricity risk curves** to reflect any update to the inputs and assumptions, if necessary. However, the **system operator** is not required to change the **electricity risk curves** for any months preceding the update to the inputs and assumptions.
- 6.5 Any change the **system operator** makes to the **electricity risk curves** applies from the date the change is made.
- 6.6 The **system operator** must use reasonable endeavours to engage with **participants** who it believes have a material impact on the inputs and assumptions it uses in the determination of the **electricity risk curves**.
- 6.7 The **system operator** must publishmake publicly available any change to the **contingent storage release information** as soon as reasonably practicable.

6.8 ~~Thermal fuel available for electricity generation in the electricity risk curves will be calculated according to the system operator's thermal fuel validation methodology.~~

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6.9 Each **participant** should make all **electricity risk curve disclosure information** in relation to the **participant** readily available to the **system operator** free of charge, as soon as reasonably practicable after the **participant** becomes aware of the information.

6.10 Despite clause 6.9, a **participant** is not required to make **electricity risk curve disclosure information** readily available to the **system operator** if—

- (a) doing so will be a breach of law; or
- (b) the **electricity risk curve disclosure information** concerns an incomplete proposal or negotiation; or
- (c) the **electricity risk curve disclosure information** comprises matters of supposition or is insufficiently definite to warrant being made readily available to the **system operator**; or
- (d) the **participant** claims legal professional privilege or privilege against self-incrimination in respect of the **electricity risk curve disclosure information**.

6.11 A **participant** that withholds **electricity risk curve disclosure information** under clause 6.10 should, as soon as reasonably practicable, make the **electricity risk curve disclosure information** readily available to the **system operator**, free of charge, if clause 6.10 ceases to apply to the **electricity risk curve disclosure information**.

6.12 A **participant** should not enter into a confidentiality agreement with another person for the purpose of avoiding making **electricity risk curve disclosure information** readily available to the **system operator** under clause 6.9.

6.13 The **system operator** must keep all information received by it under clause 6.9 confidential and must not disclose it to any other person except—

- (a) with the written consent of the person who provided the information; or
- (b) if the information is required to be disclosed to or by the **Rulings Panel** or the **Authority** under this **Code** or any law;
- (c) to the **Authority** as provided for in clause 3.3.

7. **Revoked**

7A. **Determining the electricity risk meter status**

7A.1 *Revoked*

7A.2 [Subject to clause 7A.5,](#) the **system operator** must determine the electricity risk meter status using the **electricity risk meter status curves** as follows for both the South Island and New Zealand—

- (a) Normal: **available hydro storage** is greater than the **watch status curve** and the electricity risk meter status is not 'Watch', 'Alert' or 'Emergency'
- (b) Watch: **available hydro storage** is less than or equal to the **watch status curve**, and the electricity risk meter status is not 'Alert' or 'Emergency';
- (c) Alert: **available hydro storage** is less than or equal to the **alert status curve** and the electricity risk meter status is not 'Emergency';
- (d) Emergency: the **system operator** has commenced an **official conservation campaign** under clause 9.23 of the **Code** and has not ended it under clause 9.23 A of the **Code**.

7A.3 If the electricity risk meter status for New Zealand is the same as for the South Island, a single energy risk meter status for New Zealand and the South Island is required.

7A.4 The **system operator** must [publishmake publicly available](#) any change to the electricity risk meter status.

[7A.5 The minimum duration of an electricity risk meter status of 'Alert' is 4 weeks unless:](#)

- [\(a\) available hydro storage increases above the watch status curve earlier; or](#)
- [\(b\) the conditions for the electricity risk meter status moving to 'Emergency' occur earlier.](#)

8. **Revoked**

9. **Revoked**

10. **Annual Security of Supply Assessment**

10.1 The **system operator** must prepare and [publishmake publicly available](#) at least annually a security of supply assessment that contains detailed supply and demand modelling that—

- (a) forecasts at least 5 years; and
- (b) enables interested parties to assess whether the energy security of supply standard and the capacity security of supply standard set out in clause 7.3(2) of the **Code** are likely to be met over that period.

10.2 The **system operator** must [publishmake publicly available](#) the Annual Security of Supply Assessment by 30 June each calendar year.

10.3 The **system operator** must consult with persons that the **system operator** thinks are representative of the interests of persons likely to be substantially affected by the **SOSA** before [publishingmaking](#) it ~~publicly available~~.

10.4 In addition to the information referred to in clauses 7.3(1)(a)(i) and 7.3(2C) of the **Code**, but subject to clause 7.3(2D) of the **Code**, the **SOSA** must include—

- (a) capacity and energy margin assessments including projections of the North Island **winter capacity margin**, the New Zealand **winter energy margin**, and the South Island **winter energy margin**; and
- (b) sufficient details of the inputs, assumptions, and methodologies that the **system operator** has used to prepare that information as to allow interested parties to recreate that information; and
- (c) without limiting subclause (b) of this clause, information, including the **system operator's** assumptions, about—
 - (i) existing generation and transmission capabilities; and
 - (ii) expected generation and transmission outages; and
 - (iii) generation and transmission assets to be removed from service; and
 - (iv) the availability of primary fuels and in particular thermal fuel constraints; and
 - (v) significant new generation and transmission assets to be commissioned; and
 - (vi) **demand** and **demand** reduction that occurs in response to periods of high **wholesale market** spot prices, excluding any **demand** reduction from energy savings campaigns or the forced rationing of **demand**; and
 - (vii) any other factors (such as electricity market dynamics) that the **system operator** expects to materially affect security of supply; and
- (d) information on how the **system operator** will monitor energy and capacity margins.

11. Weekly security of supply report

11.1 The **system operator** must prepare and ~~publish~~[make publicly available](#) a weekly security of supply report.

11.2 The weekly security of supply report must include—

- (a) a comparison of **available hydro storage** with the **electricity risk curves**; and
- (b) *revoked*
- (c) the electricity risk meter status; and
- (d) the **contingent storage release information**.

11.3 The weekly security of supply report must also include the following information relating to the previous 4 weeks, in an aggregated form—

- (a) hydro storage and catchment inflows; and
- (b) generation at key thermal **generating stations**; and
- (c) **demand**; and
- (d) inter-island transfers; and
- (e) other information that the **system operator** thinks will assist interested parties' understanding of the current security of supply situation.

11.4 *Revoked*

12. Simulated storage trajectories

12.0 The **system operator** must prepare and ~~publish~~^{make publicly} available simulated storage trajectories each calendar month.

12.0A *Revoked*

12.1 The simulated storage trajectories must project **available hydro storage** for the calendar year using the following inputs—

- (a) current **available hydro storage**; and
- (b) the historical range of inflows for hydro catchments; and
- (c) expected availability and use of transmission and generation **assets**; and
- (d) expected **demand**; and
- (e) the **electricity risk curves**; and
- (f) any other reasonably reliable information known to the **system operator** that the **system operator** considers to be relevant to the simulated storage trajectories.

12.1A The **system operator** may prepare and **publish** simulated storage trajectories that take into account reasonably reliable information known to the **system operator** about contract limits on the supply of thermal fuel.

12.2 *Revoked*

12.3 *Revoked*

12.4 While the electricity risk meter status is Emergency, the **system operator** must review and, if necessary, update the simulated storage trajectories at least once per calendar week.

12.5 *Revoked*

12.6 *Revoked*

13. ~~Electricity~~^{Thermal Fuel} Supply Disruptions

13.1 *Revoked*

- 13.2 The **system operator** must develop and ~~publish~~make publicly available scenarios for potential ~~electricity~~thermal-fuel supply disruptions.
- 13.3 These scenarios must consider the power system's ability during ~~electricity~~thermal-fuel supply disruptions to meet the following—
- (a) peak **demand**; and
 - (b) ongoing energy consumption.
- 13.4 The **system operator** must review and, if necessary, update these scenarios quarterly to ensure they remain current.