System Operator System Security Forecast (SSF) Guidelines

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SYSTEM OPERATOR

Keeping the energy flowing

TRANSPOWER

Transpower New Zealand Ltd The National Grid

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1. Purpose and content of System Security Forecasts

1.1. The System Security Forecasts are a forecast of the System Operator's ability to meet the principal performance obligations (PPOs) over the ensuing period of not less than 3 years, but may be extended to look for up to 5 years or more in areas of the network which may have operational constraints imposed on them. The forecast will 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.

1.2. The purpose of the System Security Forecasts is to enable identification and description of potential power system issues which may require operational management over the next 3 years or more for the System Operator to meet the PPOs prior to investment in upgrades and investment in transmission alternatives.

2. Principles for System Security Forecasts

2.1. In preparing System Security Forecasts, the System Operator must have regard to the following principles:

2 1 1. System Security Forecasts should aim to meet the reasonable requirements of industry participants to understand how potential operational issues will be managed;

2 1 2. System Security Forecasts should identify power system issues requiring operational management; and

2 1 3. System Security Forecasts should reflect the current PPOs and Policy Statement.

3. Forecast horizon for System Security Forecasts

3.1. The minimum SSF forecast horizon is 3 years. The factors which will give rise to the System Operator increasing the time horizon from 3 years to 5 years are as follows:

3 1 1. Thermal Limit

Following the analysis for the 3 year horizon, if any Area exceeds a Thermal limit, then studies will be carried out to identify the time duration that the constraint will be active for the 3 to 5 years horizon.

3 1 2. Voltage Stability Limit

Following the analysis for the 3 year horizon, if any Area has binding Voltage Stability limits, studies will be carried out for the 3 to 5 year horizon and the time duration that the constraints are binding will be noted and investigated as required.

3 1 3. Stability Limit

Following the analysis for the 3 year horizon, if any Area has binding Transient Stability limits identified, studies will be carried out to identify and validate the constraint for the 3 to 5 year horizon.

3.2. In exceptional circumstances the time duration that constraint will be active will be calculated for up to 10 years at the System Operator's discretion.

4. Assumptions for System Security Forecast

4.1. The System Operator will make the following assumptions in preparing System Security Forecasts:

4 1 1. committed projects for additional generation, transmission, and demand side management are included;

4 1 2. utilise credible demand forecasts by region or grid exit point (e.g. prudent and expected forecasts);

4 1 3. include operational management measures currently available to the System Operator;

4 1 4. a range of power system conditions will be considered for the purpose of determining:

4.1.4.1. the ability of the power system to meet the PPOs at times of peak and light demand with all assets in service;

4.1.4.2. the ability of the power system to meet the PPOs during planned maintenance outage activities.

5. Assessment in System Security Forecasts

5.1. The assessment of the System Operator's ability to the meet the PPOs will be carried out as follows in 5.2 to 5.4.

5.2. Assessment for clause 7.2 (1a) of Part 7 of the 'Code' – Avoid Cascade Failure. The System Operator manages the dispatch of assets made available to avoid cascade failure by applying power system capability limits to the operation of the power system. In cases where demand exceeds power system capability, the System Operator can still ensure the operation of the power system remains within power system capability by demand shedding prior to any event occurring. SSFs will identify situations where demand shedding or other operational measures are required to meet the avoid cascade failure PPO.

5.3. Assessment for clause 7.2 (1b) of Part 7 of the 'Code' – Frequency. The System Operator meets the frequency PPO through the procurement of the frequency keeping, instantaneous reserves and over frequency reserves ancillary services. The assessment of the ability to meet the frequency PPO is based on whether there is sufficient ancillary reserves contracted to be able to meet system peak requirements (frequency keeping, reserves and energy) over the forecast period.

5.4. Assessment for clause 7.2 (1c) of Part 7 of the 'Code' - Maintain Other Standards. This PPO requires the System Operator to identify, upon the reasonable request of a participant, the cause of a problem where harmonic, voltage flicker or voltage imbalance standards are not being met and, where requested, take actions available under the Rules to resolve the problem. The SSF will contain a statement describing the extent to which the System Operator expects to be able to meet this PPO.