

ANNUAL REVIEW AND ASSESSMENT OF SYSTEM OPERATOR'S PERFORMANCE

July 2006

Annual Review and Assessment of
System Operator's Performance

This paper outlines the Commission's review and assessment of the system operator's performance in meeting its regulatory and contractual obligations in the review period 1 March 2005 to 28 February 2006.

A. Introduction

- 1 The Electricity Regulations 2003 (Regulations) and the Electricity Governance Rules 2003 (Rules) require the Electricity Commission Board (Board) to review the performance of the system operator once every financial year.

B. Purpose

- 2 The purpose of this paper is to provide a review and assessment of the performance of the system operator in accordance with the requirements of the Rules and Regulations.

C. The Board's requirements in conducting the review

- 3 Provisions relating to reviewing the system operator's performance are set out in both the Regulations and the Rules.
- 4 Regulation 47 requires the Board to review the performance of the system operator at least once in each financial year and the review must concentrate on the system operator's compliance with:
 - a. its obligations under the Regulations and Rules;
 - b. the operation of the Regulations and Rules;
 - c. any performance standards agreed between the system operator and the Board; and
 - d. the provisions of the system operator's service provider agreement with the Board.
- 5 Regulation 48 requires the Board to show that it has taken account of the following matters when conducting the review:
 - a. the terms of the system operator agreement;
 - b. the reports from the system operator to the Board;
 - c. the performance of the system operator over time in relation to part C of the rules;
 - d. the extent to which acts or omissions by other parties have impacted on the system operator's performance;
 - e. reports or complaints from any person;
 - f. the fact that real time co-ordination of the power system involves a number of complex judgments and inter-related incidents;

- g. any disparity of information between the Board and the system operator;
 - h. any other matter the Board considers relevant.
- 6 Regulation 49 requires the Board to publicise (on its website) all self-review reports it receives from the system operator that are required under regulation 45 or the Rules within five business days of receiving them.
- 7 Rule 14 of Section II of Part C of the Rules¹ requires the Board to review and assess the performance of the system operator in carrying out its functions with respect to the policy statement in the period of the current policy statement. The Board's review and assessment of the system operator are required to be published within 10 business days after the meeting at which the assessment is carried out.

D. Approach used to conduct review

- 8 This review is the second under the new governance arrangements. The review period is the year ending 28 February 2006.
- 9 The system operator provides monthly performance reports and has also provided the Board with its own annual review of its performance. This was published on the Commission's website on 3 April 2006. The system operator is required to present this to the Board at the same time as the draft policy statement (rule 14 in section II of part C).
- 10 The self-assessment provides a commentary on many aspects of the system operator's performance and is an important input into this review by the Commission.

¹ As at 31 March 2006 when the system operator submitted its self-review, rule 14 stated, "At the same time as the **draft policy statement** is submitted to the **Board** pursuant to rule 10, the **system operator** will also submit to the **Board** a review and assessment of its performance in the period of the then current **policy statement**. This self-review will contain such information as the **Board** may reasonably require from time to time to enable the **Board** to review the **system operator's** performance in carrying out its functions with respect to the **policy statement** during this period. The **Board** will review and assess the performance of the **system operator** in that period having regard to that self-review and such other matters as the **Board** considers relevant. The **Board's** review and assessment of the **system operator** will also be **published** within **ten business days** after the meeting of the **Board** at which it completed the review and assessment."

It should be noted that an amendment was made to rule 14 in June 2006 requiring the system operator to submit its self-review no later than 30 September in each year in order to align the timing of the self-review with the period of the policy statement.

E. Review of the system operator's performance

Introduction

- 11 In completing the review and assessment of the performance of the system operator, the Commission has had regard to the requirements of the Regulations and the Rules and, in particular, the matters the Board is required to take into account. This covers the system operator's obligations under the Regulations and Rules, particularly part C on common quality and part G on trading arrangements.
- 12 The performance of the system operator has been reviewed and assessed under the following headings:
 - a. meeting principal performance obligations and other duties and functions under part C of the Rules;
 - b. procurement of ancillary services;
 - c. review and implementation of policy statement and procurement plan;
 - d. system security forecast update;
 - e. meeting the dispatch objective and other duties and functions under part G of the Rules;
 - f. system operator breaches;
 - g. meeting the requirements of the System Operator Service Provider Contract;
 - h. other duties and roles;
 - i. relationship building; and
 - j. looking forward.

Meeting the principal performance obligations and other duties and functions under part C of the Rules

Principal performance obligations

- 13 The system operator has a reasonable and prudent obligation under rule 2.1 in section II of part C of the Rules to avoid cascade failure of assets that would result in the loss of demand, arising from either frequency or voltage excursions, or from supply and demand imbalances. There have been no frequency excursions that have caused the automatic under frequency load shedding relays to disconnect demand.
- 14 The system operator is also required to be a reasonable and prudent operator in meeting the frequency obligations set out in the Rules. The table below shows the number of frequency excursions to 28 February 2006 against the

targets set out in rule 2.2.3 in section II of part C:

| Frequency band | Island | Target | Actual count |
|-------------------|--------|---------------------------|--------------|
| Hz ≤ 45 | South | 0 in any period | 0 |
| 45 > Hz ≤ 47 | South | 1 in any 60-month period | 0 |
| Hz ≤ 47 | North | 0 in any period | 0 |
| 47 > Hz ≤ 48 | Both | 1 in any 60-month period | 1 |
| 48 > Hz ≤ 48.75 | Both | 6 in any 12-month period | 1 |
| 48.75 > Hz ≤ 49.5 | Both | 60 in any 12-month period | 37 |
| 50.5 ≥ Hz < 51.25 | Both | 50 in any 12-month period | 6 |
| 51.25 ≥ Hz < 52 | Both | 7 in any 12-month period | 1 |
| Hz ≥ 52 | North | 0 in any period | 0 |
| 52 ≥ Hz < 53.75 | South | 2 in any 12-month period | 0 |
| 53.75 ≥ Hz < 55 | South | 1 in any 60-month period | 0 |
| Hz ≥ 55 | South | 0 in any period | 0 |

- 15 The actual count for targets with return periods greater than 12 months has been taken from records since the Rules came into force on 1 March 2004.
- 16 The Commission notes the first occurrence of an excursion below 48 Hz. It occurred on 4 Dec 2005 at 07:43 when a tripping of HVDC Pole 2 resulted in a loss of approximately 170 MW HVDC south transfer. This caused the South Island frequency to drop to 47.98 Hz. The Commission understands the system operator is investigating the possibility that some reserve providers did not provide the response expected by the system operator's reserve modelling tool and dispatch tools.
- 17 The Commission notes there were no instances of time error exceeding the +/- 5 second limits during the review period, nor instances where daily time error elimination was not achieved during the review period.
- 18 As a reasonable and prudent system operator with the objective of dispatching assets in a manner which avoids cascade failure, the system operator must (among other things) exercise a degree of economic management that would be reasonably and ordinarily expected from a skilled and experienced system operator engaged in the New Zealand context. There have been concerns expressed by some participants that the system operator's approach to risk management as set out in the policy statement is too conservative and, as a consequence, total costs (direct and indirect) are possibly higher than is necessary.

- 19 The Commission will explore with the system operator ways in which the system operator can focus on achieving an appropriate balance between prudent risk management and maintaining downward pressure on costs (both direct and indirect) in carrying out its duties and functions.

Coordination of ancillary services

- 20 The system operator determines the requirements for and procurement of ancillary services according to the Procurement Plan (see next section for comment on this function). It also coordinates ancillary services procured in real time to ensure it meets its PPOs. Ancillary services coordinated in real time include instantaneous reserves, frequency keeping, voltage support, over frequency reserves, and black start.
- 21 The Commission is satisfied that the system operator has procured ancillary services in accordance with the current Procurement Plan, but notes an issue with the dispatch of reserves outlined in paragraph 33.

Review of the Policy Statement and Procurement Plan

- 22 The Policy Statement and Procurement Plan are both very important schedules in the Rules, and the system operator is required to review them annually². The Commission appreciates that their review and consultation require a considerable amount of time and effort.
- 23 The Policy Statement describes the policies and means the system operator intends to observe and use to comply with its principal performance obligations in the next 12 months. It also outlines the policies and means by which the scheduling and dispatch are adjusted to meet the dispatch objective.
- 24 The Procurement Plan specifies, for each ancillary service, the principles that the system operator will apply, and outlines the process it will follow, in making an assessment of the quantity required to be purchased.
- 25 The system operator has submitted all relevant documents on time, and is to be commended for following an open and transparent consultation process in each case. The system operator has listened to and taken into consideration the advice of submitters and the Commission. This cooperative attitude and collaborative approach is appreciated by the Commission.
- 26 Overall, the Commission is pleased with the process by which the industry and the system operator regularly review the two documents to improve the policies, processes, and means by which the system operator intends to procure ancillary services and comply with the PPOs. The Commission notes that there have been a number of contentious industry policy issues requiring longer term development work by the Commission and the industry that have not been addressed in the annual review process due to the process time

² For the policy statement and procurement plan this requirement is contained in rule 10 in section II of part C and rule 4 in section IV of part C, respectively.

constraints. The Commission is considering alternative methods for updating and improving the policy statement and procurement plan.

System Security Forecast

- 27 The system security forecast is another significant body of work the system operator is regularly required to carry out. It consists of demand and supply forecasts and power system modelling to estimate the system operator's ability to meet its PPOs over the next ten years. Rule 15 in section II of part C of the Rules requires the system operator to prepare, publish, and provide to the Board a system security forecast once every two years. It is also required to revise the forecast every six months if, in the reasonable opinion of the system operator, changes to the power system warrant a revision.
- 28 The system operator produced its first system security forecast on 1 December 2004. During the review period, the system operator submitted amendments to the system security forecast in December 2005.
- 29 The Commission and the industry continue to be pleased with the quality and form of the work produced by the system operator to produce the system security forecast.

Meeting the dispatch objective and other duties and functions under part G of the Rules.

The dispatch objective

- 30 The system operator's dispatch objective is to maximise for each half hour the gross economic benefits to all purchasers of electricity at grid exit points, less the cost of supply and ancillary services. The primary tools used by the system operator to achieve this objective are the scheduling, pricing and dispatch software, and the reserve management tool. Any changes to these systems are audited in accordance with the Electricity Governance Regulations 1993.
- 31 The Commission is satisfied that the system operator submitted all pre-dispatch schedules to the clearing manager and the pricing manager on time following receipt of offers and bids. An issue has arisen concerning the correct information to be included within the pricing process. The [Commission] looks forward to working with the system operator to resolve this issue.
- 32 The number of self-reported breaches relating to updating of grid information in schedules doubled from last year to 18. The Commission is aware that these breaches can have large potential market impacts and would like to see the number reported significantly reduced.
- 33 The Commission has developed proposed rule amendments to alter the way in which reserves are dispatched in trading periods where there are insufficient reserve offers. It is concerned that the final implementation of these amendments may be delayed due to the impact of the system operator's market systems project.

Pricing

- 34 Although the system operator does not calculate final prices, decisions made by the system operator, particularly with respect to the modelling of reserves and grid assets, have a significant influence on prices. While the system operator is justifiably focused on achieving its principal performance objectives (as set out in part C of the Rules), the Commission would like to see it become more proactive in promoting downward pressure on prices by, for example, monitoring price separations across constraints and checking the accuracy of the constraints where price separations become large.

System operator breaches

- 35 The system operator's performance in relation to compliance matters is generally of a high standard. The working relationship between the system operator and Commission staff was tested with two breaches being referred to the Rulings Panel during the review period. Other than in a few instances, a good working relationship was maintained. Monthly meetings were held with Commission staff to facilitate regular contact.
- 36 Delays can occur between the time that a breach occurs and the time that it is self-reported in accordance with regulations 44 and 45 of the Electricity Governance Regulations 2003. The Commission is aware that the system operator uses a filtering process to satisfy itself that, in its view, a breach has occurred, and that this may delay reporting.
- 37 The system operator has claimed to be under-resourced on occasions and in some instances responses to the Commission's breach enquiries have been delayed. The system operator's ability to resource work for the Commission in a number of areas is of concern and has not been adequately addressed during the review period (see also paragraphs 52 and 53).

Self-reported breaches

- 38 According to the system operator's own annual review, it has self-reported 27 breaches of the Rules. The circumstances and number of instances that the system operator self-reported a breach of the Rules are presented for the 2005/06 review period in the table below. The corresponding figures for the previous period are included for comparison.

| Circumstances | 05/06 | 04/05 | Change |
|--|-------|-------|--------|
| Information provision | 2 | 5 | -3 |
| Constraint accuracy | 3 | 0 | +3 |
| Security assessment | 1 | 2 | -1 |
| Updating grid information in schedules | 18 | 9 | +9 |
| Dispatch schedule incidents | 3 | 7 | -4 |
| Grid emergency/Equipment overload | 0 | 3 | -3 |
| Total | 27 | 26 | |

- 39 The Commission is pleased to note the number of self-reported breaches has reduced in four of the six categories. There are two areas where the system operator has reported an increase in the number of self-reported breaches. These are discussed in turn.

Constraint accuracy

- 40 The system operator explains in its self-review that the self-breaches in this category relate to breaches of clause 20.5 of schedule C4 (policy statement)³. Clause 20.5 was added to the 2005 policy statement to ensure that the system operator is obligated to correctly apply security constraints to the scheduling pricing and dispatch software model.
- 41 The system operator has undertaken an external audit and internal review of its security constraint process to address process shortcomings. The Commission notes that the audit report, due to be published in April 2006, has not yet been published.

Updating grid information in the schedules

- 42 The system operator explains in its self-review that the process it uses to incorporate outage information into the dispatch schedule is manual and consequently more susceptible to mistakes. The Commission has issued formal warnings to the system operator in several instances, although the system operator considers it has already minimised the risk of breaches in this category to the lowest practicable level with its current tools and processes. However, it is replacing its market systems and expects to improve the incident rate arising from outage scheduling as one outcome of the project.

Breaches alleged by other parties

- 43 The regulations require participants, including the system operator, to notify the Board as soon as possible of any breaches committed by another participant. Other parties made a total of 14 allegations that the system operator had breached the Rules during the reporting period. The

³ Rule 20.5 states, "Correctly apply all **constraints** described in clauses 17, 18 and 19 to the **SPD** model."

circumstances and number of instances that the system operator was alleged by another party to have breached the Rules are presented for the 2005/06 review period in the table below. The corresponding figures for the previous period are included for comparison.

| Circumstances | 05/06 | 04/05 | Change |
|--|-------|-------|--------|
| Failure to send a Customer Advice Notice | 3 | 3 | 0 |
| Reserves management error | 10 | 2 | +8 |
| Applying an incorrect constraint | 1 | 1 | 0 |
| Other information provision failure | 0 | 2 | -2 |
| Dispatch instruction error | 0 | 2 | -2 |
| Total | 14 | 10 | |

- 44 The breaches alleged against the system operator in the reserve management category relate to the input information that goes into final pricing and the means used by the system operator to determine the input information. All 10 alleged breaches, which are denied by the system operator, relate to a single incident that occurred on 10 March 2004 and were alleged by the Commission. These were referred to investigation by the Board.
- 45 The failure to send Customer Advice Notice alleged breaches were closed without further investigation after a similar alleged breach in the previous reporting period was subject to a settlement agreement approved by the Commission.
- 46 The incorrect constraint alleged breach was also self-reported by the system operator.

Allegations the system operator has made against other parties

- 47 While conducting its duties, the system operator has alleged 54 breaches against other parties. The circumstances and number of instances that the system operator reported a participant breached the Rules are presented for the 2005/06 review period in the table below. The corresponding figures for the previous period are included for comparison.

| Circumstances | 05/06 | 04/05 | Change |
|--------------------------------------|-------|-------|--------|
| Technical Code non-compliance | 2 | 4 | -2 |
| Offer revision | 7 | 9 | -2 |
| Participant provision of information | 1 | 2 | -1 |
| Dispatch instruction compliance | 21 | 11 | +10 |
| Reserve offers and dispatch | 6 | 17 | -11 |
| Dispatch instruction acknowledgement | 17 | 10 | +7 |

| | | | |
|----------------|----|----|----|
| Grid emergency | 0 | 1 | -1 |
| Total | 54 | 54 | |

- 48 In respect of alleged breaches in the “dispatch instruction compliance” category, the system operator comments in its self-review that it remains concerned at the number of occasions when participants have failed to comply with dispatch instructions and revise offers following a change in generation capability. The Commission recognises that breaches of this type can have potentially serious security implications and has issued 14 formal warnings to participants following investigation of these breaches.

Meeting requirements of the System Operator Service Provider Contract

- 49 The System Operator Service Provider Contract (the Contract) contains a number of obligations pertinent to this review.
- 50 One such obligation is the requirement on the system operator to have in place and comply with a number of arrangements and procedures relating to backups and disaster recovery. The system operator has certified that it meets these requirements. The Commission is pleased to note that the system operator successfully completed a business continuity simulation exercise during the review period.
- 51 A second obligation the system operator is required to fulfil under the Contract is the requirement that it provide certain warranties. Consistent with this requirement, at 1 March 2006 the system operator warranted that it:
- a. was unaware of anything within its reasonable control which might or would adversely affect its ability to provide the contracted services under the Contract; and
 - b. had sufficient resources, skills and supervision to carry out the said services.
- 52 The Commission acknowledges this warranty and is generally satisfied with the work performed under the Contract. However, the Commission notes that the system operator has not been able to fully deliver on a number of additional requests for work under the variable component⁴ of the contract. Work delayed includes the following projects:
- a. progressing the restructuring of the asset owner test plan;
 - b. implementing changes required to process dispensations from automatic under-frequency load shedding requirements;
 - c. implementing changes to dispatch of instantaneous reserve during shortages; and

⁴ The Contract is divided into a fixed component, covering the system operator’s specific duties and functions under the Regulations and Rules, and a variable component for additional work requested by the Commission.

- d. progressing immediate common quality development priorities.
- 53 The system operator has stated that it cannot carry out this work to meet the Commission's preferred timeframes because the people required have been diverted to its market systems replacement project. If the system operator fails to find a way to solve this resourcing problem then development work will continue to be constrained over the coming months. Furthermore, it is likely to create an increasing backlog of work awaiting the completion of the market system replacement project. The Commission is keen to avoid this and is exploring options with the system operator.

Other duties and roles

- 54 In addition to its specific obligations under the Regulations and Rules, the system operator has also made a valuable contribution in a number of other areas. It has promoted a number of rule changes and made submissions on many others. It has also been asked to provide advice on issues that have not been the subject of a rule change.
- 55 The system operator undertakes a number of administrative roles provided in the Rules. For instance:
- a. issuing dispensations;
 - b. handling and assessing Asset Capability Statements;
 - c. handling and assessing asset test plans; and
 - d. managing the Planned Outage Coordination Process (POCP).
- 56 It also has bilateral arrangements provided for in the Rules; for instance, to provide outage assessments for participants.
- 57 The system operator continues to provide leadership in organising industry support and advice in regional security issues in both the upper South Island and upper North Island areas. It has also re-established the POCP industry forum to review the approach and business rules that underpin the current POCP.
- 58 The system operator has assisted the Commission with two projects to identify the operational impacts of increasing quantities of wind generation. The first was completed in April 2006. It was a 'tactical' project requiring the system operator identify more immediate and pressing rule changes that should be considered to accommodate the wind generation expected in the next 2-3 years.
- 59 The second is the Commission's Wind Generation Investigation Project (WGIP), which is a longer project with a more strategic focus. The investigation work is underway and the system operator is providing technical support to the project team. This is an important project and many stakeholders are keen to see it progressed in a timely but comprehensive

manner. The Commission is pleased with the system operator's contribution to this work.

- 60 Finally, the system operator is to be commended for being active in consulting with the industry when considering changes in its policies and processes. This approach is demonstrated by the:
- a. workshops it conducts twice a year;
 - b. face-to-face consultation meetings it has conducted; and
 - c. the staff it makes available for Commission advisory groups.

Quality of relationships

- 61 The system operator continues to demonstrate that it values the relationships it has with the Commission and others in the industry. Its commitment to a consultative approach as system operator is to be commended.

Looking forward

- 62 In summary, the Commission considers Transpower has once again performed well in the system operator's role during the review period. Looking forward, the Commission would like to see the system operator give emphasis to the following areas:
- a. effective action to reduce the current resourcing constraints which are understood to be caused by the diversion of staff to the market systems replacement project;
 - b. reduction in the number of breaches of the Rules (especially in the area of updating grid information in the schedules);
 - c. greater attention to achieving an appropriate balance between prudent risk management and maintaining downward pressure on costs (both direct and indirect) in carrying out its duties and functions; and
 - d. continued leadership in planning for and co-ordinating industry response to situations where load is considered to be at risk due to regional transmission security issues.