

System Operator Performance Review and Assessment

1 September 2010 to 31 August 2011

Final report

14 March 2012

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Executive summary

The system operator is a market operation service provider who performs a crucial role for the electricity industry in New Zealand. It must manage the processes required to coordinate generation at least cost to meet demand without overloading grid assets, while employing resources to mitigate specific threats of power supply interruptions. To emphasise the importance of this service provider role and the relationship between the Electricity Authority (Authority) and the system operator, the Electricity Industry Participation Code 2010 (Code) includes a requirement for both parties to regularly review how well the system operator is performing its role.

Under clause 7.11 of the Code, the system operator is required to provide to the Authority by 30 September each year, a review and assessment of its own performance for the previous 12 month period ending 31 August. The system operator submitted its self-assessment, and the Authority must carry out its assessment of the system operator's performance during the review period to which the self-assessment relates, having regard to the self-review and such other matters as the Authority considers relevant.

The Authority considers that Transpower, as system operator, has satisfactorily performed its core functions, meeting its principal performance obligations and the dispatch objective.

There were two areas of significant concern during the period - the system operator's use of its discretion in its operational decision making (including the need for a proactive approach to identifying potential constraint situations), and the extended period that the power system was dispatched using stand alone dispatch during the market system failure in April.

The issue of the use of discretion and the identification of potential constraints reflects a tension between achieving the system operator's security and dispatch objectives. Further optimisation appears possible and the Authority welcomes the system operator's continuing focus and engagement in this area.

In light of this tension, the Authority intends undertaking a review of the alignment of the system operator service provider agreement (SOSPA) and system operator role against the Authority's statutory objective, and is looking to establish a broader suite of performance measures with the system operator.

1 Introduction and purpose of this report

- 1.1 The system operator is a market operation service provider to the electricity market that performs a crucial role in the electricity industry in New Zealand. It must manage in real time the processes required to coordinate generation at least cost to meet demand without overloading grid assets, while employing resources to mitigate specific threats of power supply interruptions. It has other roles too, including policy development, planning and information provision in the areas of system operation and security of supply. To emphasise the importance of its role and the relationship between the Authority and the system operator, the Code includes a requirement for both parties to regularly review how well the system operator is performing.
- 1.2 The system operator submitted a review and assessment of its own performance to the Authority on 30 September 2011 for the review period from 1 September 2010 to 31 August 2011.
- 1.3 This report provides the Authority's assessment of the system operator's performance in the same review period.

2 Background

Regulatory requirements

- 2.1 Under clause 7.11 of the Code, the system operator is required to provide to the Authority by 30 September each year, a review and assessment of its own performance for the previous 12 month period ending 31 August. The system operator submitted this review which was subsequently published on the Authority's website as required by the Code.
- 2.2 Clauses 7.8 and 7.9 of the Code outline the requirement for the Authority to also perform a review of the system operator's performance, and the matters that the Authority must consider in its review. Clause 7.8 requires the Authority to concentrate on the system operator's compliance with:
 - (a) its obligations under the Code and the Electricity Industry Act 2010 (Act);
 - (b) the operation of the Code and the Act;
 - (c) any performance standards agreed between the system operator and the Authority¹; and
 - (d) the provisions of the system operator's service provider agreement (SOSPA) with the Authority.
- 2.3 Clause 7.9 requires the Authority to take into account the following matters when conducting the review:
 - (a) the terms of the SOSPA;
 - (b) the reports from the system operator to the Authority;
 - (c) the performance of the system operator over time in relation to parts 7 and 8 of the Code;
 - (d) the extent to which acts or omissions of other parties have impacted on the system operator's performance and the nature of the task being monitored;
 - (e) reports or complaints from any person;
 - (f) the fact that the real time co-ordination of the power system involves a number of complex judgments and inter-related incidents;

¹ No such standards were agreed for the year to which this review relates. A process is under way to review the performance assessment framework for future assessment periods.

- (g) any disparity of information between the Authority and the system operator; and
 - (h) any other matter the Authority considers relevant.
- 2.4 Further, the Act provides for establishment of the Security and Reliability Council (SRC), the function of which is to provide independent advice to the Authority on the performance of the electricity system and the system operator, and reliability of supply issues². According to the SRC's terms of reference³, the Authority may seek its advice on, among other things:
- “the system operator's performance including against its principal performance obligations, security of supply function and any other function of the system operator important to the performance of the electricity system and/or to reliability of supply.”
- 2.5 The SRC's advice may also then be taken into account in the review.
- 2.6 Clause 7.11(4) of the Code requires the Authority to publish its review and assessment of the system operator within 10 business days after the meeting at which the Authority completes its review and assessment.

Review framework

- 2.7 This review and assessment of the system operator's performance has been arranged under the following headings:
- (a) operation of the Code and Act;
 - (b) obligations under the Code and Act;
 - (c) performance under the provisions of the SOSPA;
 - (d) contribution to regulatory and industry development work; and
 - (e) other activities.
- 2.8 The review process aims to cover all aspects, both positive and negative, of the system operator's performance and provide constructive feedback, wherever possible, for the purpose of continuous improvement in performance.
- 2.9 In conducting this review, Authority staff preparing this report have:
- (a) considered the system operator's self-review of its performance;
 - (b) considered industry feedback on the system operator's self-review. A single submission was received from the Major Electricity Users Group (MEUG);
 - (c) sought feedback from the different Authority groups who regularly work with the system operator; and
 - (d) sought feedback from the SRC.

²http://www.legislation.govt.nz/act/public/2010/0116/latest/DLM2634346.html?search=sw_096be8ed8062360bsecurity+reliability+council&p=1&sr=2

³ <http://www.ea.govt.nz/document/13057/download/our-work/advisory-working-groups/src/>

3 Analysis framework

Operation of the Code and Act

Reasonable and Prudent System Operator

- 3.1 Although it is important that the system operator complies with all its regulatory requirements, it is especially concerned with fulfilling its core functions and obligations. The system operator, under the SOSPA, is primarily required to be a “reasonable and prudent system operator”, a term which is defined in clause 1.1 of the Code as:

“...exercising that degree of skill, diligence, prudence, foresight and economic management, as determined by good international practice and that would reasonably and ordinarily be expected from a skilled and experienced system operator engaged in the co-ordination of an integrated transmission network under the same or similar circumstances as applied in New Zealand at the time.”

Principal Performance Obligations

- 3.2 To provide more direction clause 7.2 of the Code contains a set of obligations called the principal performance obligations (PPOs). The PPOs require the system operator to:
- (a) act as a “reasonable and prudent system operator” in dispatching assets made available to avoid cascade failure of generation which results in power blackouts; and
 - (b) ensure frequency remains within prescribed upper and lower limits and number and duration of frequency fluctuations (outside the normal band) stay within specified limits.
- 3.3 There were neither blackouts nor any frequency or voltage excursions large enough to cause the AUFLS relays to disconnect demand or to exceed the prescribed limits during the review period.
- 3.4 Only one major system frequency event occurred. On 17 August 2011 an emergency shutdown of a Tiwai potline resulted in the South Island frequency rising to 51.26 Hz before recovering.
- 3.5 Clause 7.2(1)(b)(v) of the Code requires the system operator to act as a reasonable and prudent system operator with the objective of ensuring frequency time error is no greater than five seconds of New Zealand Standard time. There were no instances of time error exceeding the five second limit.
- 3.6 The system operator declared a total of 87 grid emergencies during the review period (up from 37 the previous year). The vast majority of the grid emergency declarations involved managing the system around the 110kV connection between Waikato and the Bay of Plenty, as high Waikato river flows and a lack of generation north of Hamilton caused congestion in the area.
- 3.7 These problems were highlighted in October 2010 when the Kinleith overload scheme tripped, resulting in the loss of supply to the Kinleith paper mill and the Tokoroa area. Such problems continued over December 2010 and January 2011 and appeared again in August 2011 following high Auckland demand, but these events were managed by the system operator without further disruption.
- 3.8 The Authority acknowledges that the system operator is working on temporary splits at Arapuni or Kinleith to help mitigate these issues⁴, and that the North Island grid upgrade will alleviate congestion over the longer-term.

⁴ The Arapuni split became fully operational in late September 2011.

- 3.9 Grid emergency declarations were also issued following the two main earthquakes in Canterbury (4 Sept 2010 and 22 Feb 2011). However, they did not cause any major power system management issues and the system operator was able to continue with business as usual.
- 3.10 Other grid emergencies were declared due to reconfiguring grids to avoid post-contingency violation on circuits, restoring load or security following forced outages, and managing the loading on grid assets to avoid exceeding stated capability under normal power system conditions. These events were managed without further disruption.
- 3.11 While the Authority acknowledges the high standard of system security over the past year, it remains concerned that the standard being delivered is higher than that embodied in the existing Code requirements, particularly the Security Policy set out in the Policy Statement. This higher standard comes at a cost in additional ancillary service procurement. It notes that instantaneous reserve procurement costs are very significant (\$22m in 09/10 and \$60m in 08/09) and that opportunities for reducing these have now been identified⁵ by the system operator.
- 3.12 A review of the security policy has been identified as one component of the system operator's project to review the under-frequency management arrangements. The outcomes of this review, when implemented, should provide significant benefit and reduced procurement costs. The Authority encourages the system operator to progress its activities under this project as soon as possible as they are considered by the Authority to be of a high priority.

Dispatch objective

- 3.13 Clause 13.57 of the Code requires the system operator to fulfil the dispatch objective, which is to take the offers from generators and maximise, for each half hour, the gross economic benefits to all purchasers of electricity at the grid exit points, less the cost of supplying the electricity at the grid injection points and the costs of ancillary services purchased by the system operator.

Upper North Island grid constraints, January 2011

- 3.14 The system operator used its discretion to operate outside of the dispatch objective in late January because of high Waikato river flows, low prices and reduced generation offers in the upper North Island. Huntly and Southdown generation were brought on out-of-merit-order to avoid load management issues due to constraints in the Kinleith region. This resulted in some high prices for constrained on generation.
- 3.15 The system operator developed an artificial constraint to be used in the scheduling, pricing and dispatch tool (SPD) to provoke the dispatch of this generation and avoid the use of co-ordinator discretion. A procedure was also implemented for advising participants when out-of-merit-order generation was being constrained-on for system security reasons.
- 3.16 As the system operator notes in its self-assessment, *"the high prices resulted in industry and Regulator concern"*. While the Authority acknowledges that the system operator put considerable effort into developing and testing the constraint to address the situation, it considers that there was potential for the situation to have been anticipated earlier and avoided.
- 3.17 The Major Electricity Users Group (MEUG) notes that the system operator's self-assessment on this incident is *"silent on the material effect caused by the system operator's actions in January, processes to ensure systematic reporting of such events and discussion of a path forward to improve management in the future. In this instance the use of discretion by the system operator led to constrained on payments between 23rd and 27th January 2011 of \$6.47m. This is not only material it also highlights a significant flaw in the market design to effectively manage such*

⁵ System operator report - Under-frequency Management, Work Stream 1, Reserve Review Phase 1

events. Publication of the constrained on charges paid by consumers for each discrete use of discretion should be included in future self-assessments. Only with such monitoring can a view on the performance of the system operator's management of such events be taken and decision makers realise the extent of uncapped liability facing all consumers through use of system operator discretion."

- 3.18 MEUG goes on to say that *"The reference [in section 2.1.2 of the self-assessment] to price effects having been a factor in implementing a constraint needs further investigation. We suggest the Authority ask the system operator how they traded off price effects in the Waikato with price effects to all other parties paying spot prices."*
- 3.19 The Authority has requested the system operator to consider ways of reporting in its monthly performance report the costs of its use of discretion to constrain on plant.
- 3.20 MEUG notes that the system operator has requested urgent consideration of a proposed Code amendment to the constrained on provisions. MEUG considers that this is not a straight forward issue, and requests the Authority consult on this proposal because there are important questions about ensuring accountability and allocating liabilities to the party best capable of managing the risk that need to be considered.
- 3.21 The relative priority of the proposed Code amendment is being considered by the Authority as part of its work programme and appropriations planning process.

Constrained-off wind generation

- 3.22 All North Island wind was constrained off on 30 and 31 January 2011 and 16 and 17 October 2010 together with some Waikato hydro. These situations drew attention to resource consent limitations affecting generators, as on two occasions, generators claimed an inability to comply with instructions to reduce generation, as to do so would breach applicable resource consent requirements.

General

- 3.23 The Authority is satisfied that the system operator performed well against its dispatch objective during the period. However the January constraint issue revealed the need for more timely information to be made available to the market when the system operator utilises its discretion to constrain on generators. This need has since been met by the release of near real time notifications by the system operator and publication by the Authority of all instances of this use of discretion at the end of the month.

System operator's use of discretion

- 3.24 These instances where the system operator has used its discretion to address constraints have raised questions about whether market implications are always receiving adequate consideration alongside security implications in the system operator's operational decision making.
- 3.25 In light of this tension the Authority has instigated a review of the alignment of the SOSPA and related elements of the system operator's role with the Authority's statutory objective⁶, with a view to ensuring that the economic impacts of the system operator's decision making are appropriately captured and to enhance operational transparency.

⁶ The Authority's statutory objective is to promote competition in, reliable supply by, and the efficient operation of, the electricity industry for the long-term benefit of consumers. Inadequate recognition of economic considerations in the SOSPA may hinder the achievement of this objective.

Other notable events

Grid outage 26 March 2011

- 3.26 On Saturday 26 March, during a long-planned grid outage in the Hamilton region, generation at Genesis Energy's Huntly station was dispatched at \$20,000 prices. Operationally, the outage was managed as expected and no system security issues arose. The dispatch which resulted in the historically high prices was in merit order.

Market systems outages

- 3.27 The system operator was affected by a number of events during the period that negatively affected its market dispatch systems. Situations where the system operator must rely on its standby tools for lengthy periods can be detrimental to participants.
- 3.28 On 20 April 2011 two uninterruptible power supply units failed during a routine test of the back-up power supplies in Transpower House, Wellington. This affected several of the market system servers in the Wellington computer centre. While power system security was not compromised by the event, optimal dispatch was compromised and publishing of some data services failed. The system operator used back-up systems during the interruption.
- 3.29 The Authority is concerned that this switch-over process failed and the time it took for the systems to be brought back into normal operation.
- 3.30 More generally, the Authority notes that the Stand-Alone Dispatch procedures have operated more often than anticipated, which is undermining confidence in the market systems.
- 3.31 The system operator has initiated several reviews regarding the management of critical facilities. A number of recommended improvements to management and oversight of such facilities are being undertaken.
- 3.32 The Authority understands that the system operator is undertaking a peer review of their investigations into and response to this market system failure and is interested to hear outcomes in due course.

Storms

- 3.33 Extreme weather in August 2011 caused significant and numerous outages of circuits and transformers in the lower North Island, particularly in the Wellington region. Electricity consumption reached record peaks during the storm (7048.8MW on 15th August). The system operator efficiently managed this difficult month.

Compliance with obligations in the Code and Act

- 3.34 As a key service provider to the electricity market, the Code and Act place many other obligations on the system operator. This section presents the Authority's assessment of the system operator's compliance with these obligations.
- 3.35 In its self-review, the system operator reported a decrease by 2/3^{rds} in breaches of the Code, from 43 breaches in 2009/10 to 15 in the reporting period. The 15 breaches in the reporting period were the result of manual errors and IT issues. As the system operator suggested in its previous review, the new market system has significantly decreased the amount of manual requirements in real time associated with grid changes.
- 3.36 The Authority applauds the continued reduction in the number of Code breaches. Furthermore, the system operator is to be congratulated on the increasing level of engagement it has shown on compliance matters, and its willingness to thoroughly investigate the circumstances surrounding

its own breaches. The compliance regime is based on self-reporting – openness and transparency are essential for this to operate effectively. The Authority considers that the system operator's approach provides an excellent model for other participants.

- 3.37 There were two instances of grid voltages exceeding Code limits during the reporting period. The system operator has:
- (a) an investigation underway into a lack of response from Waitaki generation to correct high voltages when the Islington_Livingston Circuit was removed from service concurrent with a planned outage on the 220 kV Aviemore_Waitaki Circuit; and
 - (b) resolved a control system issue that led to high voltages on the Christchurch 66 kV network during commissioning of a new controller in Islington.

Policy statement and procurement plan

- 3.38 The system operator is required to review two important schedules to the Code each year; the policy statement and the procurement plan.
- 3.39 A new policy statement comes into force on 1 September each year. It documents the policies and practices the system operator will follow to meet the PPOs and the dispatch objective. It includes the means by which it plans to maintain the integrity of the power system following the sudden and unexpected loss of generation or transmission assets and the situations in which it might have to shed load.
- 3.40 The procurement plan comes into force on 1 December each year. It sets out the requirements, the method, and the means by which the system operator intends to procure ancillary services, (instantaneous reserve, frequency keeping, voltage support, over frequency reserve, and black start). Once the new plan is finalised each year, the system operator negotiates and manages contracts with ancillary service agents to provide ancillary services. It then coordinates the scheduling and dispatch of electricity and ancillary services to meet its PPOs. The costs of these services are allocated to participants according to the Code.
- 3.41 The annual review process for both schedules is largely mature as it was a part of the Rules since they were introduced in 2004, and has been retained as a provision in the Code. Recent drafts have generally contained only relatively minor enhancements and amendments rather than substantial changes.
- 3.42 Some stakeholders objected to removing some of the manual constraint processes in the policy statement after the introduction of SFT and expressed concerns over the ongoing provision of constraint information. The Authority is aware that the system operator is working with stakeholders to address these concerns via a separate process.
- 3.43 The system operator proposed no significant changes to the procurement plan in 2011.

System security planning

- 3.44 As part of its system security planning, the system operator engages in several planning activities across different time frames, all of which are important in maintaining the integrity of the power system and achieving the PPOs. Initiatives that the system operator undertakes in this area include:
- (a) the System Security Forecast (SSF);
 - (b) new obligations under the Act; and
 - (c) a review of AUFLS effectiveness.

System Security Forecast

- 3.45 For its long-term planning, the system operator produces a SSF. This uses demand and supply forecasts and power system modelling to provide the system operator's view of its ability to meet its PPOs over the next three (or more) years. The Code requires the system operator to publish a new SSF once every two years and to review the need to revise the latest SSF every six months.
- 3.46 The system operator published a new SSF in December 2010. The Authority expressed some concern over the conservative power factor assumptions used in the analysis however the system operator stands by its view of using the worst case power factor assumptions in its analysis.
- 3.47 The System Operator also undertook a study to assess the ability of the grid to meet the forecast and prudent peak demand over the 2010/11 summer and 2011 winter periods. No issues were identified.

New obligations under the Act

- 3.48 The system operator acquired security of supply and emergency management functions under the Electricity Industry Act 2010. The system operator has since commenced a review of the Emergency Management Policy⁷.
- 3.49 The annual Security of Supply Assessment is now also produced by the system operator. The 2012 assessment is currently being prepared.⁸
- 3.50 The Authority has raised several concerns with the system operator on the derivation of the hydro risk curves and transparency of input information. The system operator and Authority are now working through these issues.
- 3.51 The Authority acknowledges that the system operator has newly acquired these obligations, and that the past year has been one of transition and implementation, with the system operator establishing process and systems to fulfil its new duties. The Authority looks forward to the receipt in 2012 of the system operator's review of Security of Supply Forecasting and Information Policy where consideration will be given to the issues raised by the Authority on the hydro risk curves.

Development programme

- 3.52 Clause 7.7 of the Code requires the system operator and the Authority to agree and publish a Joint Development Programme. This programme coordinates and prioritises items on the Authority's industry development work plan on which the Authority intends to liaise with the system operator, and the items on the system operator's capital expenditure programme that are provided to the Authority under the SOSPA. The Joint Development Programme is a key input into the Authority's work plan.
- 3.53 A Joint Work Planning Team has been developed for the specific purpose of agreeing, maintaining, and communicating a work plan that reflects industry development needs and priorities. The system operator has compiled its capital expenditure plan in consultation with the Authority, which consists of 61 projects to be delivered or commenced within the three year planning period. The Authority notes that the programme is substantially greater than that of previous years. Consequently improved programme and project management capacity and capability is being developed by the system operator to meet this challenge.

⁷ The revised Emergency Management Policy was Gazetted and published on 19 December 2011.

⁸ The 2012 assessment was published on 31 January 2012.

- 3.54 The Authority considers that the establishment of a Joint Development Programme is a positive step towards a more effective and co-ordinated approach to meeting the needs of both the system operator and the Authority.
- 3.55 However, more improvement is sought from both the Authority and system operator as the new arrangements bed in. Areas of particular concern include transparency on project progress against milestones and financial accountability.

Performance under Service Provider Agreement

- 3.56 The SOSPA sets out the terms under which Transpower will perform the role of system operator.
- 3.57 In addition to the requirement to meet its obligations under the Code and Act, the SOSPA makes explicit a requirement for the system operator to maintain a disaster recovery plan. The system operator has been reviewing its disaster recovery plan, which will then be submitted to the Authority for approval. The review process has included:
- (a) selection of two new fall back venues in Wellington, intended to provide a work space and key resources for members of the system operator business continuity team in the event that Transpower House becomes unavailable due to a disaster;
 - (b) a simulation to test the system operator Business Continuity Plan and the set up of the Wellington fall back venues; and
 - (c) identification of some areas for further development of the business continuity plan, to be progressed over the coming year.
- 3.58 This system operator and Authority have reviewed which of the system operator's key software packages should be classed as auditable software and have agreed the Simultaneous Feasibility Test (SFT) software should be added. An audit process for SFT will be established in due course.
- 3.59 The financial review provided in the system operator's self-review stated that the base agreement fees charged to the Commission and Authority totalled just over \$29.7 million, for the period from 1 September 2010 to 31 August 2011, plus fees of \$753,865 for services in addition to those provided under the base contract, specifically related to Technical Advisory Services Contract (TASC) advice..
- 3.60 The system operator has maintained staffing levels at around 100 FTEs and has commenced an update of the functional analysis under the SOSPA to reflect its current activities. This work is ongoing.
- 3.61 The Authority considers that this is an area where there has been a significant increase in positive engagement.

Regulatory and industry development work

- 3.62 The system operator has provided assistance to the Authority on the development of several Code amendments and development initiatives over the review period.

Section 42 matters

- 3.63 The Authority's work priorities over the past year have been dominated by section 42 of the Act, comprising seven new matters to be addressed. The system operator has been involved in varying degrees in the proposed design of these initiatives, in particular, financial transmission rights (FTRs), scarcity pricing (SP), dispatchable demand (DD) and demand-side bidding and forecasting (DSBF).
- 3.64 The Authority considers that:

- DSBF and FTRs have received good engagement and progress has been satisfactory.
- Scarcity Pricing did not proceed well in the initial phases, but as the scope of the Code development options has become clear, engagement and progress has been satisfactory.
- DD has been notable in that engagement has been problematic and will require a concentrated effort to achieve the implementation date.

3.65 The Authority looks forward to working with the system operator in implementing these projects.

Technical Advisory Services

3.66 The system operator entered into the Technical Advisory Services Contract (TASC) with the Electricity Commission in September 2009. The TASC is a consultancy arrangement for the provision of advice that relates directly to the system operator's role and expertise. During the review period, the system operator provided advice to the Authority on the following projects:

- (a) Multiple Frequency Keeping
- (b) Extended Control – development of post event compliance
- (c) Under-Frequency Management Project:
 - (i) AUFLS review
 - (ii) Reserves review
- (d) Normal Frequency Review:
 - (i) Normal frequency standards and limits
 - (ii) Time error
 - (iii) Generator AOPOs in the normal band
- (e) Managing Locational Price Risk
- (f) Scarcity Pricing
- (g) Dispatchable Demand

3.67 The Authority is pleased with the structure and formality that the TASC arrangement has provided for the system operator's provision of these services.

Multiple Frequency Keeping

3.68 The system operator investigated an alternative approach to Multiple Frequency Keeping based on block dispatch and alternative offer arrangements. A prototype was progressed as a capital project and a report provided to the Technical Stakeholders Group in August 2011 to determine the final solution with the industry.

3.69 The Authority considers this project has progressed well over the review period. A significant achievement was the completion of a prototype trial in the South Island and the Authority and system operator need to actively progress this project, The Authority considers multiple frequency keeping to be a high priority project for the coming year.

Extended Control – development of post event compliance

3.70 The system operator investigated the possibility of extending the use of low cost interruptible load (IL) utilising frequency sensitive relays. The system operator finalised the report and this was received by the Authority in February 2011.

3.71 The Authority considers that engagement on this project was difficult and would have been enhanced by a more proactive attitude to the investigation.

AUFLS review

3.72 Following the results of the system operator's review of the AUFLS scheme in 2010, it has been working to identify options to address the issues identified and improve the efficiency of the scheme, and determining the costs and benefits of those options. The system operator held two industry workshops during the year to obtain feedback, and will be considering this feedback before making a recommendation to the Authority.

3.73 The Authority considers that the system operator has done excellent technical work to date, but there is a need to integrate the market/economic side now and progress implementation which will involve the system operator providing support to the Authority as it progresses relevant market considerations and Code amendments.

3.74 MEUG notes that the system operator's self-assessment on the Under-Frequency Management Project states, inter alia, *"From the workshop discussion, there did not appear to be any widespread desire for dynamic market arrangements nor a lack of firm proposals as to how such market arrangements would ensure the provision of AUFLS load."* MEUG itself, and several of its members submitted contrary views. MEUG considers that:

- *"ancillary services procurement policy decisions including possible market mechanisms for AUFLS is the responsibility of the Authority not the System Operator"*
- *"the System Operator should be more transparent about this debate and publish all submissions received on its web site."*

3.75 The Authority agrees with MEUG in so far as the Authority is responsible for ancillary service procurement policy. However the Authority has contracted the system operator to progress a certain scope of work on behalf of the Authority and the industry. The Authority will investigate the potential for market arrangements for AUFLS as part of its upcoming work programme.

Reserve review

3.76 The system operator investigated measures that could offer a more reliable, secure, and cost effective under-frequency management system. Improvements to the Reserve Management Tool were recommended.

3.77 The Authority considers that this work has progressed well with the identification of the issues and potential fixes. The system operator needs to now push ahead with those fixes that are within its control and support the Authority's investigation into wider market changes.

Normal frequency standards and limits

3.78 The system operator looked at the appropriateness of the normal frequency band and the probability standard, and concluded that the current normal frequency band is optimal for New Zealand.

3.79 The Authority considers that this work was essential as a basis for progressing other related projects; e.g. Multiple Frequency Keepers.

Time error

3.80 The system operator considers that the uses for which time error was originally developed have become obsolete, and has recommended the Authority consult on whether it is necessary to maintain a Code requirement for this.

- 3.81 The Authority supports this recommendation and a Code amendment will be consulted on in due course.

Managing Locational Price Risk

- 3.82 The system operator developed an alternative model for the Financial Transmission Rights initiative. The report and a cost for implementation were provided to the Authority in April 2011.
- 3.83 The Authority considers that this project is an example of good engagement with both the Authority and the system operator aligned to meet an objective.

Scarcity Pricing

- 3.84 A high level cost of the operator requirements for Scarcity Pricing was provided in July 2011 for the purposes of a cost benefit analysis. Indicative timeframes were also provided.
- 3.85 The Authority considers that although the initial engagement on this development initiative was difficult due to various movements in the scope of work the outcome sought was achieved.

Dispatchable Demand

- 3.86 A high level cost of an initial proposal for Dispatchable Demand and associated timeframes was provided to the Authority in June 2011.
- 3.87 The Authority considers that this particular project did not receive sufficient engagement by the system operator and there is ongoing discussion on implementation timeframes.

Simultaneous Feasibility Test (SFT) Software

- 3.88 SFT automated constraint generation was enabled in late March 2011, after a six-month period of testing and consultation with the industry.
- 3.89 It was delivered within budget and without any ongoing software issues requiring future rectification.
- 3.90 The Authority considers that SFT went live with minimal industry disruption noting that issues on constraint information provision are under ongoing discussion with participants.

Systems development

- 3.91 The system operator implemented two system changes during the review period:
- (a) Interim Pricing was implemented on 22 September 2010; and
 - (b) SFT and part of the Performance Enhancements project changes were implemented on 6 December 2010. The balance of the Performance Enhancements were implemented on 4 August 2011.

Proposed code changes

- 3.92 The system operator made two recommendations for changes to the Code during the review period:
- (a) A Code amendment proposal to clarify the constrained on provisions in clauses 13.202 – 13.212 of the Code; and
 - (b) For the Authority to consider Code amendments relating to the commissioning process in its current review of costs associated with commissioning.

- 3.93 The Code amendment proposal (a) has been put into the Authority's work planning process and proposal (b) is included in current Code development work.

Other activities

- 3.94 The system operator has a variety of other roles not already mentioned in this report. This section reviews the manner and form of some of the more significant interactions, including:
- (a) Memorandum with Sarawak Energy;
 - (b) reporting;
 - (c) asset commissioning; and
 - (d) stakeholder relations.

Sarawak Energy memorandum

- 3.95 Transpower has entered into a memorandum with Sarawak Energy Berhad (SEB), a corporate entity in Malaysia responsible for the generation, transmission and distribution of electricity in the state of Sarawak, Malaysia. Transpower and SEB operate a similar size AC power system with similar characteristics. Transpower considers the relationship provides opportunities to learn from other utility's technical experience, and gives opportunities and professional exposure to technical personnel.
- 3.96 The Authority considers that it is important that the system operator maintain a world view to support its operational and development activities in New Zealand.

Reporting and data provision

- 3.97 The system operator prepares and publishes monthly reports on:
- (a) its performance in complying with its various obligations; and
 - (b) the performance of the power system.
- 3.98 The system operator also provides regular data feeds for the Central Data Set (CDS) and prepares ad hoc reports and data for the Authority when requested.
- 3.99 The Authority appreciates the system operator's responsiveness to operational data requests and enhancements in the structure of the monthly reports. Discussion on automated data feeds is an area for more focused attention.

Asset commissioning

- 3.100 Technical code A of schedule 8.3 of the Code requires that asset owners liaise closely with the System Operator when they want to commission new assets. The Contact Energy gas turbine peaker plants at Stratford were commissioned during the review period. The commissioning process began in November 2010 and proceeded through into May 2011. There were no system security issues arising from the commissioning process.
- 3.101 The next major asset commissioning is Pole 3 of the HVDC. The system operator is heavily engaged in preparing for this work, and any associated changes to the existing Poles.

Stakeholder relations

- 3.102 The system operator disseminates information via various means, emailing updates to subscribers, holding industry workshops and posting information on its website, and needs to manage relationships with various stakeholders.

Website

- 3.103 The system operator has continued to add additional website information intended to give participants greater knowledge about the status of the power system and enhance participants' ability to manage local networks. The system operator's statistics suggest that the industry finds the website a useful source for security information, particularly during abnormal system events, with overall visitor numbers up 27% on the previous review period.
- 3.104 The Authority considers that the website is well designed with a reasonably intuitive structure making it easy to find items of interest.

Customer satisfaction survey

- 3.105 The system operator has engaged an independent consultant to conduct a customer satisfaction survey to assess participants' views on the system operator's service standards. Interviews are planned to commence in October 2011.
- 3.106 The delay in the start of this survey is an issue as the results have not been available to the Authority when undertaking this performance assessment.

Rowing world championships

- 3.107 This major event in November 2010 at Lake Karapiro was managed without impact on lake levels and surface conditions.
- 3.108 This was a challenging task because Waikato River flows were very high, there were issues arising from low prices and reduced upper North Island generation offers and there was the continuing need to maintain security in the Kinleith region in the face of constraints on the Hamilton-Whakamaru circuits.
- 3.109 The system operator handled a difficult situation in a professional manner.

4 Conclusions

- 4.1 The review in this report covers the twelve months from 1 September 2010 to 31 August 2011. The system operator's self-review report for the same period is a key input into the Authority's review and assessment.
- 4.2 The Authority considers that Transpower, as system operator, has satisfactorily performed its core functions, meeting both its principal performance obligations and the dispatch objective.
- 4.3 There were two areas of operational concern during the period - the system operator's use of its discretion in its operational decision making (including the need for a proactive approach to identifying potential constraint situations) and the extended period that the power system was dispatched using stand alone dispatch during the market system failure in April.
- 4.4 Engagement on particular industry development initiatives has been variable but with the set up of the joint work planning team to help facilitate the section 42 matters by the end of the assessment period satisfactory progress had been made for all of the initiatives.

4.5 The system operator has invested a lot of resource during the period in upgrading its approach to project management and good results have been achieved. The Authority fully supports this investment and hopes to see continuous improvement in the delivery of projects.

