

Aspects of system operator performance for further consideration

29 August 2012

1 The SRC has identified several system operator performance issues for further consideration

- 1.1 This 29 August 2012 meeting initiates the next round of SRC discussions on system operator performance. It is expected the SRC will conclude these discussions at their next meeting and provide any necessary advice to the Authority Board.
- 1.2 Following its last consideration of system operator performance the SRC's report to the Authority Board¹ identified the following issues would be retained for further consideration at this next review:
 - a) the system operator's use of discretion to dispatch out-of-merit order generation for system security reasons;
 - b) integrity of the market systems (that have experienced two failures in the past year);
 - c) performance of the Reserve Management Tool (RMT);
 - d) system operator's processes for proactively delivering the most competitive market outcomes on behalf of the industry, particularly in respect of ancillary services; and
 - e) delivery of major industry projects (with post-project review of the Market Services Project (MSP) considered to be a potential case study).
- 1.3 The secretariat requested the system operator provide further information on the five matters to assist the SRC in its discussions. The system operator has replied with a letter that is attached as appendix B.
- 1.4 This paper provides an introduction to these matters to assist the SRC with their considerations.

2 Requested Action

- 2.1 The SRC is requested to:
 - a) identify whether the system operator's response indicates a satisfactory resolution of the issues (seeking further information from the system operator as required), or whether they would like to pursue these matters further; and
 - b) identify whether there are any other matters related to system operator performance where it would like the secretariat to provide information or advice for the next meeting.

¹ SRC letter of 19 January 2012 to the Authority Board, 'Performance assessment of the system operator', attached as Appendix A.

3 The Code allows the system operator to use its discretion to dispatch out-of-merit order generation for system security reasons

- 3.1 This issue became of interest to the SRC as a result of events on the system in January 2011 where the system operator used its discretion to constrain on Huntly thermal units for a significant period of time while they developed equations that enabled them to address transmission constraints in the Waikato region (while ensuring the power system remained in secure operation). The Huntly generation was required to be dispatched at a higher price than the prevailing market price.
- 3.2 Market participants did not become aware of the impact of this use of discretion until they received their invoices the following month. The constrained on payment resulted in purchasers facing costs of approximately \$7 million, as opposed to the \$1-\$2 million that would normally have been expected.
- 3.3 Market participants would prefer to know that the system operator is using its discretion to constrain on plant, and the node that this is occurring, as close to real time as possible, as this would provide them with an opportunity to respond to the potentially higher prices. More timely information would also help them to be able to verify their invoices.
- 3.4 Authority now produces a report each month that lists the system operator's use of discretion in the previous month, including the node where it occurred.
- 3.5 The system operator also now provides a near real time notification of the use of discretion and the node at which the generation or reserves are being or have been constrained.
- 3.6 The system operator requires the flexibility of using its discretion to maintain a secure system and ensure that it achieves the Principal Performance Objectives (PPOs). The issue has been one of ensuring that market participants receive sufficient information to be able to respond, and also to ensure the system operator has the appropriate tools at its disposal when exercising its discretion.
- 3.7 The system operator's letter notes that a reasonable proportion of their uses of discretion relate to potline changes at the Tiwai aluminium smelter. The system operator manages these changes through the application of constraints at Manapouri. This enables the impact of these changes to be managed locally, avoiding wider system impacts.

4 Integrity of the market systems

- 4.1 The 'market system' is the IT data and applications the system operator uses to operate the power system in a secure fashion. The requirement on the system operator to manage the real-time operation of the power system 24/7/365 with zero down time requires the system to be robust to dealing with unforeseen events, and to have appropriate back-up systems, processes and contingency plans.
- 4.2 In recent times the system operator has experienced several failures of their market system that have required them to use backup systems for a longer than the two hour duration that is perceived to be acceptable (outages of any longer than this can become

an issue because dispatch schedules cannot be produced while the market system is down). As the system operator notes in its letter, a comprehensive, independent review of the events has identified a range of actions to improve the robustness of the systems that they are now pursuing.

- 4.3 The system operator notes the volume of change to the system has had an impact on the market system operation, but it is not clear whether it is the changes and upgrades that have caused the actual failures. The Authority acknowledges there has been, and will continue to be, a need for the system operator to appropriately manage the volume of change and the challenges that this entails. The Authority does however want to continue to engage with the system operator on the possibility to better manage the cost, complexity and timeliness of changes required to enable market enhancements.

5 Performance of the Reserve Management Tool (RMT)

- 5.1 The Reserve Management Tool (RMT) is the software used by the system operator to calculate reserves procurement quantities. The Authority is concerned the inputs and assumptions that form the basis for RMT are inefficient, resulting in the system operator procuring more reserves than are actually required to meet the security standards. This could be resulting in significant additional cost to the industry.
- 5.2 The system operator's letter suggests participants need to make a choice between the status quo (i.e. "over-procuring" reserves, but avoiding some quantity of load shedding events as a result) and more efficient modelling (resulting in a reduction in reserves procurement but with the potential for an increase in frequency of load shedding events²). It can be argued this choice has already been made, as the Code already specifies that contingent events can take the frequency down to 48 Hz (and so the system operator tools should align with the Code requirement). The security standards reflect economic decision making, balancing the cost of procuring reserves against the value or lost load.
- 5.3 The Authority and the system operator have been working together on a review of under-frequency management (UFM) arrangements (<http://www.systemoperator.co.nz/ufm>). The work carried out under this review by the system operator has increased the transparency of the issues with under-frequency management and the Authority will continue to work with the system operator on the resulting actions.

6 System operator's processes for proactively delivering the most competitive market outcomes on behalf of the industry, particularly in respect of ancillary services

- 6.1 The Authority has a strong interest in increasing competition in ancillary services markets, and projects such as the multiple frequency keepers (MFK) initiative are part of its developments in this area. The MFK project and the actions resulting from the UFM review are both on the Authority's 'top priority' project list. As a point of clarification, it should be noted that projects such as the national reserve market are Authority policy

² Note that the number of under-frequency events would not be expected to change, just the number that require automatic load shedding.

initiatives that will require system operator technical and operational input (and system changes), i.e. it is not the system operator who will be directly undertaking the policy and market development.

7 Delivery of major industry projects

- 7.1 This issue was raised by the SRC in relation to concerns about the ability of the system operator to deliver and implement the system changes required for new market developments. The market systems project (MSP) the SRC had identified as being of particular interest is perceived by some industry participants to have been poorly managed.
- 7.2 The system operator has initiated a range of processes that it expects will meet the needs of industry for project delivery. The Authority expects to continue to work with the system operator on ensuring the successful implementation of these processes, together with improvements in other important areas such as the timeliness and accuracy of project costs and delivery timelines; and processes for prioritising between the projects the system operator has to undertake of as part of Transpower, those it must undertake to maintain its own systems and processes (allowing it to act as a reasonable and prudent operator) and the major industry projects being pursued by the Authority.

8 Attachments

- 8.1 The following items are attached:
- a) Appendix A – Letter from SRC to Authority Board dated 19 January 2012; and
 - b) Appendix B – Letter from system operator to the SRC dated 13 August 2012.

Appendix A Letter from SRC to Authority Board 19 January 2012

19 January 2012

Dr Brent Layton
Chairman
Electricity Authority Board
PO Box 10041
Wellington 6143

Dear Brent

Performance Assessment of the System Operator

As part of its functions, the Security and Reliability Council (SRC) is tasked with providing the Electricity Authority (Authority) with advice on the system operator's performance including against its principal performance obligations (PPOs), security of supply function and any other function of the system operator important to the performance of the electricity system or to reliability of supply. The purpose of this letter is to provide the SRC's feedback to the Authority on the system operator's performance.

1. Historical performance assessment

The SRC was presented with a work in progress draft of the Authority's assessment of the system operator's 2010/11 performance report. The SRC considered that it was not appropriate that it assess the system operator's performance at this detailed level. The SRC saw no need to duplicate the Authority's own assessment and saw its role to be of a more strategic and forward-looking nature. On this basis the SRC considered that it would be appropriate to look at the establishment of a broader set of performance measures for the system operator and to identify aspects of the system operator's performance that warranted their further consideration. The SRC is comfortable with the process that the Authority has undertaken in reviewing the system operator's 2010/11 performance.

2. Establishing additional system operator performance measures

At its three meetings to-date the SRC has considered a range of information on system operator performance and the measures that might be available to consider whether the desired level of performance is being achieved. The PPOs of the system operator are set out at clause 7.2 of the Code, but there are a number of other areas where its performance can influence the operation of the power system and electricity market. The Code, the System Operator Service Provider Agreement (SOSPA) and the compliance regime all incorporate elements of performance.

The SRC has asked the Secretariat to continue discussions with the system operator and to propose a suitable range of performance measures for the SRC to consider at its next meeting. The SRC has requested that the performance measures:

- include consideration of the system operator's strategic responses to future needs (as the Authority's existing assessment is at more of a transactional level);
- recognise the importance of transparency of operations, governance arrangements to ensure delivery of obligations under the SOSPA and strategic development, although it is recognised that such measures are difficult to produce;

- are developed in a way that allows the set of indicators to evolve over time; and
- are ranked in priority, given that some measures are significantly more important than others, with the PPOs having the highest priority.

3. Aspects of performance for further consideration

A number of other issues were considered by the SRC, but as consensus was not reached on these they will be retained for further consideration at the SRC's next review of system operator performance. These include the:

- system operator's use of its discretion to dispatch out-of-merit order generation for system security reasons;
- integrity of the market systems (that have experienced two failures in the past year);
- performance of the Reserve Management Tool (RMT);
- system operator's processes for proactively delivering the most competitive market outcomes on behalf of the industry, particularly in respect of ancillary services; and
- delivery of major industry projects (with a post-project review of the Market Services Project (MSP) considered to be a potential case-study).

We look forward to discussing these matters with you at your Board meeting on 31 January 2012.

Yours sincerely



Kevin Thompson

Chair

Security and Reliability Council

Appendix B Letter from the system operator to SRC dated 13 August 2012



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13 August 2012

Mr Kevin Thompson
Chairman
Security and Reliability Council
PO Box 10041
WELLINGTON 6143

Dear Kevin

PERFORMANCE ASSESSMENT OF THE SYSTEM OPERATOR – ASPECTS OF PERFORMANCE FOR FURTHER CONSIDERATION

The Electricity Authority requested the System Operator give consideration to each of the matters raised in section 3 (*Aspects of performance for further consideration*) of your letter '*Performance Assessment of the System Operator*', dated 19th January 2012.

The purpose of this letter is to provide you and other members of the Security and Reliability Council additional information that may assist in your further discussions relating to the review of system operator performance.

We look forward to discussing these matters with you.

1. System Operator's use of its discretion to dispatch out-of-merit order generation for system security reasons

The System Operator does at times exercise discretion to depart from the dispatch schedule but only when necessary to meet the dispatch objective.

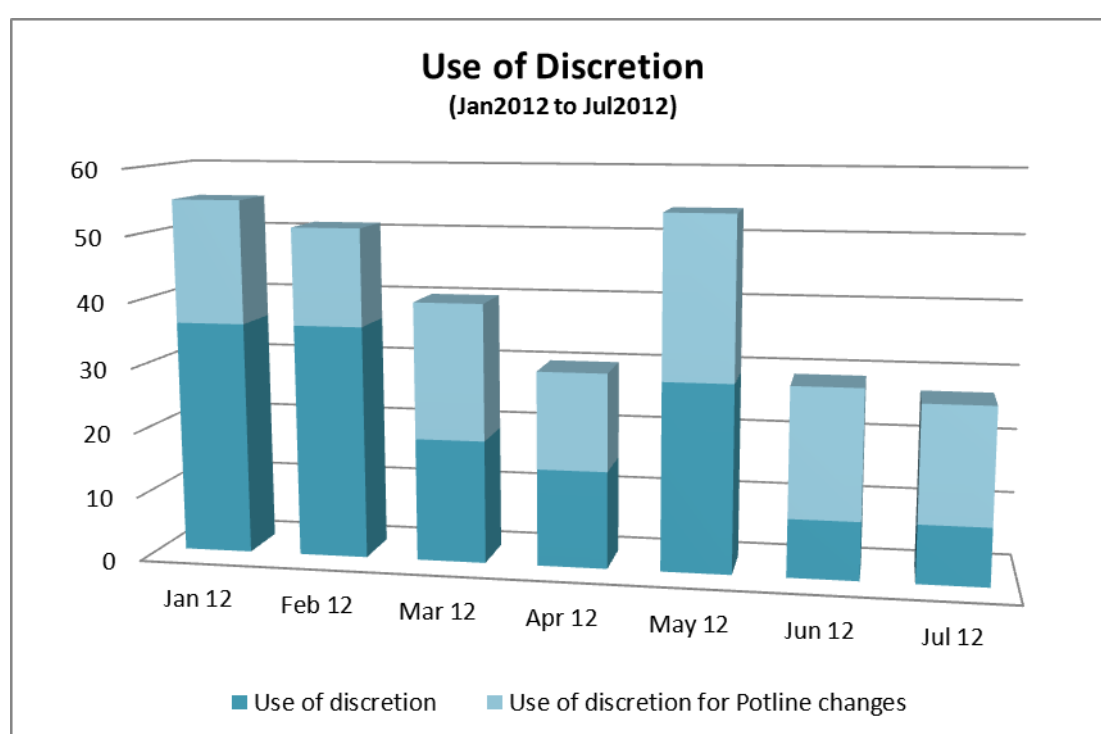
In the period of August 2011 to July 2012 the System Operator recorded six-hundred and twenty four (624) uses of discretion. Noting there are typically multiple 'use of discretion' reported in managing a single event. For example, on the 7th January 2012 eighteen (18) of the twenty (20) 'use of discretion' recorded under clause 13.70 related to managing an Edgecumbe to Owhata violation. To manage the Huntly 13th December event approximately 90 'use of discretions' were used to manage the security of the power system.

The System Operator in assessing the need to use discretion must base the decision on information available at the time. In real-time management of the power system there are always combinations of factors that must be taken into consideration when managing security of supply.

The following are some examples of appropriate use of discretionary action:

- Dispatching offered quick response plant to manage (at least in the short term) any steady state or contingent event loading violations or energy shortfalls
- Tiwai reduction line operations where a generator is used for the load changes e.g. Manapouri
- Low system frequency where after an event the frequency “hangs” low and is not recovering
- Restoration of grid following a widespread loss of supply or Black Start
- Loss of control of plant and/or station which consequently increases output
- Applying a discretionary constraint on a generator unable to generate due to a transmission outage which isn’t modelled.

Given the real-time co-ordinator’s perception of the immediacy and seriousness of the risk of insufficient supply to meet demand (i.e. system security is at risk), an immediate decision (as a discretionary action) is made to manage security by constraining on generation.



Use of discretion - noting the vast majority of discretionary constraints applied to Manapouri are to manage potline reductions at Tiwai.

The number of ‘use of discretion’ to manage planned and emergency smelter potline load changes does tend to vary but as can be seen in the graph above the number can contribute to over half of the monthly use of discretion.

Market information relating to use of discretion

There is a new policy statement clause (93A) that takes effect on 1 September 2012 that requires the System Operator to notify NZX for publication when it has used discretion to constrain generation or reserves. This functionality has already been implemented by the System Operator. The notification will include the limit of the constraint and the node at which the generation or reserves has been constrained.

The System Operator also notes the Electricity Authority has included the 'use of discretion' in the recently communicated Electricity Authority project; "System Operator Performance Alignment Review" – *Project drivers : 5(b) concerns that the system operator's use of its discretion in its operational decision making having not appropriately recognised the economic impacts of those decisions.*

2. Integrity of the Market Systems

While there were two Market System failures in the past year, it is important to note that backup systems and processes ensured the power system, and the Market, continued to operate and end-use consumers were not affected.

The market system is highly integrated and complex in its design. There are dependencies, data flows and relationships between components internal and external to the market system. Refer to Fig 1 below.

What makes up the Market System?

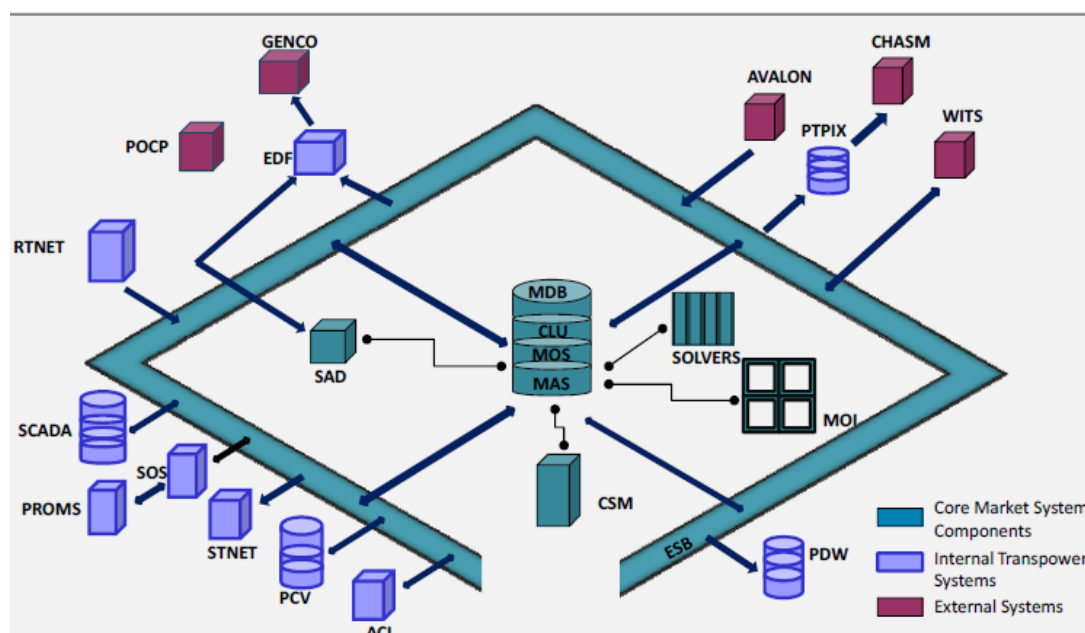


Fig 1 – Market System structural diagram

Management of the Market System – number of releases

In the last 12 months the System Operator has overseen 6 significant system change releases. The changes in the 11/12 financial year are:

1. Market System (MS) Enhancements Project

- a. Upgrade Transient Stability Assessment Tool (TSAT) and Power System Assessment Tool to Version11
- b. MS Release 1 – number of minor changes grouped together
- c. MS Release 2 – Improvements to Common Source Model particularly preparatory work to enable progression to single grid model and better modelling of 3-winding transformers – required for upcoming SCADA upgrade.
- d. MS Release 3 – Improvements to user interfaces
- e. Business Service Management Modelling - provide detailed model and monitoring tools for 7 prioritised MS service catalogue items to provide real time visibility of the status of the monitored components.

2. **Market Data Base Performance Enhancements** – improve performance – particularly solve and query times
3. **HVDC Pole 3 – SO Tools** – changes to MS to allow modelling, scheduling and despatch Pole3
4. **Interim and Variable Line Ratings**
5. **Change Management tool Parts 1 and 2** – manage modelling tasks across SCADA and MS. Manage MS enhancements.
6. **Demand side bidding and Forecasting (section42 initiative)**
Plus Initial phases of larger projects completed:
 - a) **TSAT Online** – Implemented Phase 1
 - b) **Remedial Action Scheme** – Implemented Phase 1 - Proof of Concept providing RAS in Study Time Network Analysis
 - c) **Situational Awareness** - Pilot
 - d) **Load Forecasting Trial** with Participants.

In successfully implementing the high number of releases the System Operator is continually seeking improvement. The most recent release to production of Demand-side Bidding and Forecasting went very well with no adverse impact on market participants.

The current Market Systems went live back in July 2009 and as our experience and knowledge of the systems grows the System Operator continues to improve in change management.

Managing the integrity of the Market System during change

The System Operator follows a disciplined change management process. Prior to making any changes to the market systems the testing phase are detailed and thorough. It covers many 'types' of testing such as preparing test scripts, unit test (i.e. a single component), integration test (ensuring data is being passed correctly between components and that the change works with other parts of the system), performance test (making sure it doesn't negatively impact the performance of the existing system), system test (ensuring requirements are met) end-to-end and user acceptance testing, participant testing (where applicable), and regression testing (ensuring nothing else has broken as a result of the changes).

Testing validates the changes being applied will perform correctly against the specified requirements, but also ensures that existing functionality and processes that should not be impacted are preserved. This is critical for the System Operator who must ensure that its real time operations are maintained and not compromised.

The System Operator has also considered the wider supports and dependencies of these systems

Over the previous year we have worked closely with our Transpower IST group in gaining a better understanding of the overall system performance. This has involved documenting high level system descriptions of the Market System including critical functions and modes of operation. The development of schematic diagrams has also assisted us in both incident response and discussions around future system requirements to deliver on market initiatives.

The System Operator in gaining a greater awareness of its critical systems has recently created a new role specifically looking to provide oversight and co-ordination of critical systems infrastructure which is vital for Transpower and in particular the System Operator to carry out its critical functions.

Learnings from the past are being applied

The System Operator in 2011 commissioned an independent review of Transpower's response to the Market Systems event of 20th April 2011. The review was undertaken with the purpose of analysing Transpower's response to the incident and the resulting impact on the market dispatch systems.

In early 2012 the System Operator presented the report to the Electricity Authority System Operator Committee along with key recommendations and the corrective actions. The System Operator continues to actively manage the key recommendations from that report.

Volume of change

Challenges remain with the volume of changes being implemented in our systems.

In the previous 12 months six change releases were successfully implemented into the systems, people and business processes.

The System Operator continues to work with the Electricity Authority in joint-planning on a 10 year horizon. The resulting Joint Development Plan will give a clear view of likely change in the years ahead. Based on a joint Electricity Authority/System Operator 10 year plan with in excess of 40 projects, indications are that management of change will remain a significant challenge for both the System Operator and the Electricity Authority.

The Joint Development Plan focuses on delivering outcomes in three strategic areas, namely:

- Market design – to support the development and improvement of the Electricity Market
- Technology upgrade / Process improvement – management of technology platforms and processes to ensure delivery obligations are maintained
- Innovation – identifying technology and process improvements to work smarter and realise improvements

Examples of projects in each of the above areas are included in the table below by way of example.

Strategic Outcomes	Sample Projects
Market Design	• Financial Transmission Rights • Locational Price Risk Phase 2 • Gate Closure • Improved Real Time Price Signals
Technology upgrade / Process improvement	• Transient Stability Analysis Tool (TSAT) Online • Regional Operating Centre Integration • Testing Training Simulator Environment (TTSE) Upgrade • Enterprise Service Bus Review
Innovation	• Situational Awareness 2 • Remedial Action Scheme 1 – EMS • Scarcity Pricing • Wind Forecasting

The Joint Development Plan is going through the final stages of drafting and publication and will be published to key stakeholders in the September period.

3. Performance of the Reserve Management Tool (RMT)

The System Operator and Electricity Authority recently undertook an investigation into Reserve Management Tool (RMT) to understand why power system events seldom took the frequency below 49Hz yet the standard is 48Hz and what options existed around this.

The findings of this work are documented in the Collective review available at <http://www.systemoperator.co.nz/n4579.html>

The System Operator has identified that changing the RMT simulation time will significantly reduce the amount of reserve procured per trading period which puts downward pressure on reserve prices. However, it requires ancillary service providers to provide post event data at a resolution finer than the existing 6-second data obligation. The System Operator recommends 20 milliseconds to obtain the maximum reduction in quantity procurement. Without the finer data resolution, the System Operator is unable to prudently reduce the amount of reserves procured.

The System Operator also recommends modelling actual interruptible load (IL) response times to reduce procurement quantities. Again, this would necessitate finer resolution post event data from IL providers.

If the System Operator implements the changes described above, the amount of reserves purchased from the market will be reduced, thus allowing the frequency to fall to the mandated 48 Hz point during an event. The grid does not typically experience frequency this low; therefore, there may be some unexpected outcomes. For example, had these changes been applied since 2005, NZ would have experienced two more Automatic Under Frequency Load Shedding (AUFLS) events, in addition to the recent December 2011 Huntly event.

The System Operator is of the view that there is a choice to be made by Market participants, whether:

1. To reduce procurement, save the money, run to a 48Hz standard and accept increased consumer disruption, or,
2. To maintain procurement, spend the money we are currently spending, change the standard and avoid consumer disruption.

What is clear is that consumer interests are not best served by the current arrangements.

The Collective review document is currently with the industry and we are soliciting feedback while planning our next steps with the Electricity Authority.

4. Proactively delivering the most competitive market outcomes on behalf of the industry, particularly in respect of ancillary services

The System Operator is well aware the electricity system will continue to change over the next 20 years. The System Operator is engaging more and more with Participants beyond the grid, as customers and aggregators are becoming more active participants.

The System Operator is working closely with demand aggregators resulting in increased participation in both North and South Islands Instantaneous Reserves market. We expect this trend of increasing demand-side response will continue. We are seeing this in the reserves market with increased participation of relatively small (kilowatt) demand groups. These are then aggregated, and offered into the market.

The SO has been encouraging increased competition in the frequency keeping market with the inclusion of Stratford generation. There are now three contracted frequency keepers in the North Island. The inclusion of a large generating unit into the frequency keeping market has had to be considered in conjunction with the security issue of also being the credible event risk setter (largest unit) on the power system. To increase competition into the frequency keeping market security has been managed at Transpower's risk over the last 6 months using a manual procedure whereby Stratford (SPL) is only allowed to be selected as frequency keeper (FK) when its cleared MW + FK band is less than the island risk. All manual procedures are prone to error and the System Operator is in the process of self-reporting several breaches relating to Stratford frequency keeping. In addition to other Market System changes, predominately being driven by the Section 42 Initiatives, the System Operator has programmed a Market System - SPD change to replace this manual procedure with a robust automated solution.

In addition to resolving this security issue this change can be viewed as an enabler for future increased competition and FK market development.

Multiple Frequency Keeping (MFK) initiative - The success of this initiative depends on the commitment and engagement of all stakeholders – Electricity Authority, System Operator, other Market Service Providers and Participants (Frequency Keeper asset owners).

This project is an Electricity Authority initiative to implement the first stage of a multiple frequency keepers (MFK) market. It is part of a wider Electricity Authority led initiative to lower frequency keeping costs by increasing competition in the provision of frequency keeping services. The Electricity Authority aim is to increase competition by allowing multiple providers to share the frequency keeping duty simultaneously, thus allowing smaller players into the market and lowering barriers to entry. In the longer term the Electricity Authority also looks to establish a national frequency keeping market via the HVDC as this will allow greater competition between islands. However, such national markets are in the future and require code changes from the Electricity Authority, additional technology to be installed by the grid owner, and for the System Operator to modify its Market Systems.

The System Operator plays a core role in the Electricity Authority's initiative by delivering the technology to co-ordinate the action of the multiple frequency keepers in real time. The System Operator will concurrently modify the ancillary service contractual arrangements, business processes and training requirements to implement the new frequency keeping arrangements.

Procurement plan - The annual procurement plan review and consultation with industry provides the opportunity to align ancillary service procurement and standards for procurement with changes in the industry. The System Operator actively engages with the Electricity Authority and industry Participants when developing the annual procurement plan.

Longer term - For long term actions we expect to see the introduction of new market concepts that are dependent on the outcomes of other projects and the outcomes of the short term actions. Industry consultation and policy development is required for:

- a. A National Reserve Market when Pole 3 is commissioned
- b. A Very Fast Reserve product for generators and demand responders
- c. A market solution for raising the overall inertia of the New Zealand grid
- d. Wind generators encouraged to offer both energy, inertia and voltage reserves with appropriate rule changes

5. Delivery of major industry projects (with a post-project review of the Market Services Project (MSP) considered to be a potential case-study)

It is clear from the joint work planning with the Electricity Authority that the System Operator will continue to be actively involved in delivering industry projects, while managing its existing delivery obligations.

Whereas in the past these industry projects have been absorbed within existing project capability, the System Operator has committed to a Project Framework which focuses on meeting the challenge in project delivery. Key aspects of the Project Framework are highlighted below.

Programme and Project Visibility

The System Operator has established a new process of project status reporting with the intention of:

- a) Improving System Operator senior management visibility of key projects in the delivery pipeline;

- b) Ensuring alignment within System Operator on where projects are at and any challenges faced; and
- c) Identifying any trends and opportunities for improvement in the project space.

Project Status Reports are compiled fortnightly by Project Managers and are highlighted in a System Operator Programme Dashboard. The Dashboard is reviewed by System Operator Senior Management and subsequently the Electricity Authority.

The following are guiding principles for reporting to the Electricity Authority:

1. Single version of the truth – the System Operator and Electricity Authority will work from a common view of project status including known issues and challenges.
2. Information should be handled maturely – all parties should react in an appropriate and considered manner to project updates taking care to avoid exacerbating problem scenarios.
3. Questions and clarifications through appropriate channels – questions and points of clarification will be addressed through agreed communications channels.
4. Management control stays with Project Manager – any corrective action or proposed changes in direction will be agreed with and managed by the relevant Project Manager(s).
5. Regular forum required to address trends and direction – the System Operator and Electricity Authority will meet in a regular forum to review the System Operator Programme Dashboard and key projects.

System Operator Project Life Cycle

The System Operator Project Life Cycle establishes a standard approach to delivering projects whether industry initiatives or life cycle projects. It is a common reference point for Project Managers and business managers to:

- Clarify what the project phases are from inception through completion;
- Identify the steps in each phase by way of supporting checklists; and
- Identify key artefacts and templates to support successful delivery.

In other words, the System Operator Project Life Cycle establishes the agreed standard way of doing projects. It should be noted that this new life cycle approach is proving very valuable for co-ordinating with other stakeholders such as the Electricity Authority and Transpower IST for planning purposes.

A key aspect of the System Operator Project Life Cycle will be Project Closure (including Post Implementation Review) where key project lessons learnt will be recorded.

Programme Governance and Management

The System Operator is looking closely at whether it has the appropriate governance arrangements, processes and controls in place across the project life cycle. Improvements in this area will include:

1. Clarifying project roles and responsibilities – greater clarity on the responsibilities and accountabilities of managers and staff taking part in projects is required.
2. Establishing the Programme Management function within System Operator – the work on the Project Framework to date has highlighted the need for greater management support in the projects area focusing on project standards, processes and disciplines.
3. Refining existing governance arrangements – existing governance arrangements are being refined to ensure that we optimise the use of everyone's time and get people contributing in the right areas.

The Project Framework has highlighted the need for the System Operator to continuously assess the likely demands that projects will present and how it responds accordingly. The Project

Framework provides a significant platform for establishing medium and long term System Operator project capability that is commensurate with market and industry requirements.

In developing the System Operator Project Management Framework the System Operator has closely considered the report prepared by Phil Royal of PricewaterhouseCoopers for the Electricity Authority and the System Operator in September 2011. The System Operator supports the conclusions and recommendations outlined in the 'Review of Section 42 Timelines' report. The report identified a number of opportunities that can potentially reduce timeframes and improve the overall lifecycle approach in future. We look forward to working with the Electricity Authority to implement more of the PWC report recommendations.

Yours sincerely

A handwritten signature in black ink, appearing to read 'K. Devine', with a long horizontal line extending from the end of the signature.

Kieran Devine
General Manager System Operations

Copy to : Carl Hansen - Chief Executive