

Annual review of the system operator's performance

The Authority's annual review of system operator's performance for the year ending 30 June 2017

16 March 2018

The Authority has reviewed the system operator's performance for the year to June 2017

The Security and Reliability Council's (SRC) functions under the Electricity Industry Act 2010 include providing advice to the Electricity Authority (Authority) on the performance of the system operator.

The Electricity Industry Participation Code requires both the system operator and Authority to perform an annual review of the system operator's performance.¹

At its 6 November 2017 meeting, the SRC considered the system operator's self-review for the year ending 30 June 2017, as well as the Authority's initial assessment of the system operator's performance ("the initial assessment") for the same period. At this meeting, the SRC considered that, in general, the system operator had performed well over the review period. The SRC also provided advice encouraging the system operator to "reduce the likelihood of breaches and other issues being caused by manual errors".

The Authority has since completed its review of the system operator's performance ("the review"). The review was published on 13 March 2018 and is attached to this paper.

The purpose of this paper is to obtain any further feedback from SRC members on the performance of the system operator. The review has a three-page executive summary which should be a sufficient level of detail for most SRC members. The complete review (which has 18 pages of content) is attached so SRC members can read more detail on any particular matters of interest.

The system operator has demonstrated a continued trend of improved performance over the review period

In general terms, the Authority's view of the system operator's performance is unchanged from the initial assessment.

The Authority continues to have a high level of confidence in the system operator's performance. The Authority is pleased with the system operator's progress towards four of its five strategic goals.

As noted in the initial assessment, the Authority had some concerns about the system operator's performance in its security of supply functions. The Authority understands that the system operator has identified ways to improve the way it manages security of supply and is devoting substantial resources to making these improvements.

The Authority's consideration of the 2 March event has been excluded from the review

The most significant power system event during the review period was the automatic under frequency load shedding (AUFLS) event on 2 March 2017. The SRC considered this event at its 13 December 2017 meeting and provided extensive advice to the Authority.

The Authority noted in the initial assessment that it would consider how the system operator performed before, during, and after this event once it had considered Transpower's report on the event. The system operator has recently opened its own review into this event and it is possible that their findings may be incorporated into Transpower's to-be-published report on the event.

¹ The requirements of both the system operator and the Authority with respect to the annual processes to review the system operator's performance are specified in clause 7.11 of the Code.

Transpower's report is not yet finalised, though the Authority is concluding its consideration of the event based on a well-advanced draft version of Transpower's report. In order to not unduly delay the annual review, the Authority excluded this event from its scope. The Authority will ensure that its views are either reflected in the Transpower report or published separately.

Questions for the SRC

The SRC may wish to consider the following questions.

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| <p>Q1. What further information, if any, does the SRC wish to have provided to it by the secretariat?</p> <p>Q2. What advice, if any, does the SRC wish to provide to the Authority?</p> |
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Annual review of the system operator's performance

For the year 1 July 2016 to 30 June 2017
Final report

13 March 2018



Executive summary

This review assesses the system operator's performance for the 12-month period ending 30 June 2017. It is produced in accordance with Part 7 of the Electricity Industry Participation Code 2010 (Code).

The scope of the review includes the performance of the system operator under both the Code and the system operator service provider agreement (SOSPA).

The inputs into the review were the system operator's self-review for the same period, observations from Authority staff and advice on draft versions of this review from the Security and Reliability Council (SRC), the System Operations Committee of the Authority Board (SOC), and the system operator.

The conclusion of the review is that the system operator has demonstrated a continued trend of improved performance over the review period.

The Authority values the increasingly collaborative working relationship it has with the system operator, which has been driven by senior management at the system operator. The system operator delivered numerous outputs of an excellent standard over the review period, particularly in the real time pricing (RTP) project.

The Authority believes the system operator is clearly focussed on how it can better support the long-term benefit of consumers, and looks forward to continuing to work with the system operator in achieving this objective.

However, the Authority does have some concerns about the system operator's performance in its security of supply functions, although the system operator's performance in this area did not lead to any security of supply risk. We understand the system operator has identified ways to improve the way it manages security of supply and is devoting substantial resources to making these improvements.

The system operator has set five strategic goals, which are outlined in its strategic plan. The strategic goals provide the system operator with a clear and positive direction, and the Authority is encouraged by the system operator's progress towards four of the five goals.

However, due to the concerns about the system operator's performance in its security of supply functions mentioned earlier, the Authority considers the system operator needs to improve its performance in delivering competition with security.

The Authority's view of the system operator's progress towards each of the strategic goals is set out below.

- **Delivering competition with security:**

The Authority was generally happy with how the system operator responded to low hydro inflows during the 2017 autumn and early winter. The system operator was communicative and engaged well with industry during the event. However, the system operator did not appear as well prepared for this security of supply event as the Authority expected it to be. The system operator's funding application was generally of a good standard, with the exception of how it defined the trigger point for spending such funding. The system operator also would have been better prepared if it had delivered the Security of Supply Forecasting and Information Policy (SOSFIP) review to the Authority by 13 March 2017 as agreed. The Authority recommends that the system operator improve its security of supply preparedness

(see recommendation 1 below). The Authority understands that such improvements are already well advanced.

The Authority is pleased with the planning the system operator undertook for emergency management.

- **Demonstrating value for money:** The system operator made some excellent contributions to projects over the review period. The system operator's work on RTP was a standout for the year. Projects were generally completed on time and on budget. Going forward, a more iterative process when developing the scope and options of a project would be beneficial so that the Authority's views are successfully fed into the process. The Authority recommends that the approach taken in the RTP project be applied to similar projects in the future (see recommendation 4 below).

The system operator continued to show a commitment to meeting its compliance obligations in the Code. It was open and proactive in reporting breaches. Documents incorporated into the Code by reference that do not relate to security of supply were reviewed successfully.

The system operator has made progress towards meeting the four recommendations in the 2015-16 review of the system operator's performance. However, further work is needed to meet two of the 2015-16 recommendations. Specifically, the Authority would like to see the system operator assess its performance against the actions set out in the strategic plan, and an explicit statement in future self-reviews on how the system operator is proactively managing risks. The Authority has made further recommendations in these respects (see recommendations 2 and 3 below).

- **Planning for tomorrow:** The Authority recognises the initiative the system operator has continued to display in considering how future industry change may impact on system operations, and what opportunities may arise from new technologies and changes in market conditions.

The system operator's work considering what risk management lessons can be learnt from three overseas events or trends showed foresight and was of great value.

- **Strengthening relationships:** The system operator and the Authority continue to have a strong working relationship that is underpinned by their relationship charter. Over the review period the relationship has continued to improve, becoming more collegial, collaborative and supportive.

The system operator has also demonstrated good working relationships with other stakeholders. For example, the system operator engaged well with the industry at workshops and in relation to Meridian Energy's contingent storage proposal.

- **Investing in good people:** The Authority was impressed by the overall performance of the system operator's staff over the review period. A highlight of the year was the system operator's continued improvement in its project management capability. This has led to projects running smoothly and to time.

The clarity of the system operator's reports has also improved. However, there is still more that could be done in this area. In particular, the Authority recommends the system operator improve its capability in the area of economic analysis (see recommendation 5 below).

Overall, the Authority is pleased with the system operator's performance over the review period. The Authority supports the system operator in continuing to align itself with the joint objective, and in responding to the five recommendations included in this review, which are to:

- Recommendation 1:** *Improve security of supply preparedness. With respect to its security of supply function, the system operator should:*
- *think more proactively and strategically about the needs of its security of supply function*
 - *strengthen its capabilities for situations of security shortage, including plans and processes that are well documented and efficiently designed*
 - *leverage its organisation-wide project management capability.*
- Recommendation 2:** *Consider assessing its performance against the actions set out in the strategic plan (the relevant strategic plan being the plan that ends at the same time as the year in review).*
- Recommendation 3:** *Consider including information in future self-reviews that enables readers to assess the system operator's performance with respect to risk management.*
- Recommendation 4:** *Apply the successful approach taken in the RTP project to similar projects in the future.*
- Recommendation 5:** *Ensure that system operator improves its organisational capability for economic analysis, including cost benefit analysis.*

Contents

Executive summary	ii
1 Introduction	6
This annual performance review is required under the Code	7
This annual performance review covers all aspects of the system operator's performance	8
2 Delivering competition with security	9
Power system status, events and challenges	9
The system operator managed the power system competently	9
Implementation of the National Market for Instantaneous Reserve was successful	9
Security of supply and emergency management	10
The system operator should improve its security of supply function	10
The system operator is ensuring it is prepared for emergency management	12
3 Demonstrating value-for-money	13
The system operator has made progress in responding to the Authority's recommendations in last year's review	13
Joint work planning has continued to operate well	14
The system operator has delivered commercial services of a high standard	15
The system operator has performed well in compliance-related areas	16
4 Planning for tomorrow	19
The system operator has shown initiative in preparing for the future	19
5 Strengthening relationships	20
System operator and Authority continue to have a strong working relationship	20
System operator has been proactive and engaged	21
6 Investing in good people	22
The quality and skill of the system operator staff was of a good standard	22
The system operator needs to continue to improve the clarity of its reports	22
The system operator has improved its project management capability	22
7 Overall the system operator demonstrated continued improvement over the review period	23

Tables

Table 1: System operator response to last year's recommendations	13
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1 Introduction

- 1.1 The system operator is a market operation service provider that performs a crucial role for the electricity industry in New Zealand. The system operator must coordinate resources (mainly dispatchable generation) to meet demand at least cost. This must be done in real time, without overloading grid assets, while employing resources to mitigate specific threats of power supply interruptions.
- 1.2 The system operator also has a role in working with the Authority to support and facilitate industry development and day-to-day operations that promote competition, ensure reliable supply, and promote efficient operation of the electricity industry, for the long-term benefit of consumers.
- 1.3 In recognition of the importance of this service provider role and the relationship between the Authority and the system operator, Part 7 of the Code requires both parties to regularly review how the system operator is performing its role.
- 1.4 This Authority review of the system operator's performance covers the 12-month period ending 30 June 2017.
- 1.5 The inputs into this review were:
 - (a) the system operator's self-review of its performance for the same period (self-review)
 - (b) the observations of Authority staff who have worked with the system operator during the review period
 - (c) advice from:
 - (i) the SRC, based on a draft version of the executive summary of the annual review
 - (ii) the SOC, based on a draft version of the annual review
 - (iii) the system operator, based on both draft and near-final versions of the annual review.

This annual performance review is required under the Code

- 1.6 Requirements for the Authority's review of the system operator's performance are outlined in Part 7 of the Code. In particular:
- (a) Clause 7.8 of the Code requires that the Authority review the performance of the system operator at least once each year, concentrating on the system operator's compliance with:
 - (i) its obligations under the Code and the Electricity Industry Act 2010 (Act)
 - (ii) the operation of the Code and the Act
 - (iii) any performance standards agreed between the system operator and the Authority
 - (iv) the provisions of the SOSPA.
 - (b) Clause 7.9 of the Code requires that the Authority's review takes into account:
 - (i) the terms of the SOSPA¹
 - (ii) reports from the system operator to the Authority, including the system operator's annual self-review which is required by the Code
 - (iii) the performance of the system operator over time in relation to parts 7 and 8 of the Code
 - (iv) the extent to which acts or omissions of other parties have affected the system operator's performance and the nature of the task being monitored
 - (v) reports or complaints from any person, and any associated responses by the system operator
 - (vi) the fact that the real time coordination of the power system involves a number of complex judgments and inter-related incidents
 - (vii) any disparity of information between the Authority and the system operator
 - (viii) any other matter the Authority considers relevant to assess the system operator's performance.
- 1.7 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"*.
- 1.8 Achieving this objective requires the system operator's support. In recognition of this and the fact that the Authority and system operator have many objectives in common, the two organisations agreed a relationship charter in 2014. The relationship charter sets a *joint objective* for the two organisations, to promote competition, ensure reliable supply, and promote efficient operation of the industry, for the long-term benefit of consumers. It also outlines principles for resolving tension, and pursuing the joint objective.
- 1.9 The relationship charter is the primary 'performance standard' that the Authority has considered under paragraph 1.6(a)(iii).

¹ In February 2016, the Authority and system operator signed a new SOSPA, which came into effect on 1 July 2016. This annual review is the first time the system operator's performance has been assessed against this new SOSPA.

This annual performance review covers all aspects of the system operator's performance

1.10 The Authority's review aims to:

- (a) cover all aspects of the system operator's performance - both positive and negative
- (b) provide constructive feedback, wherever possible, for the purpose of continuous improvement in performance.

1.11 The Authority has assessed the system operator's progress towards each of its five strategic goals (set out in its strategic plan) over the review period. The strategic goals are:

- (a) delivering competition with security
- (b) demonstrating value for money
- (c) planning for tomorrow
- (d) strengthening relationships
- (e) investing in good people.

1.12 The Authority is pleased with the system operator's overall performance—the system operator has demonstrated a continued trend of improved performance over the review period. The Authority has concerns about some aspects of the system operator's performance of its security of supply functions, but has been impressed by the system operator's performance in the real time pricing (RTP) project, its project management capability, and the increasingly collaborative way it engages with the Authority.

2 Delivering competition with security

Power system status, events and challenges

The system operator managed the power system competently

- 2.1 The most significant power system event during the review period occurred on 2 March 2017. In that event, coincident transmission circuit disconnections led to the separation of the South Island into two electrical systems. As a result, there:
- (a) was an over-frequency situation in the lower South Island
 - (b) were under-frequency situations in the upper South Island (with automatic under frequency load shedding (AUFLS) feeders tripping) and in the North Island (with interruptible load being shed).
- 2.2 The Authority has not, as at the date of this review, completed its consideration of the 2 March 2017 event. Due to incompatible timing, the Authority has excluded that event from the scope of this review. Once it has completed its consideration of that event, the Authority will consider whether to publish relevant information for stakeholders.
- 2.3 Another major system event during the review period was the Hawke's Bay snow storm. A snow storm in the Hawke's Bay region during August 2016 led to two widespread outages in quick succession. After the first outage, the system operator tried to avoid the second outage by creating an electrical island, but could not do this in time. In direct response to this event the system operator now has plans in place to successfully create an electrical island.
- 2.4 Other major events during the review period were the November 2016 Kaikoura earthquake and the Port Hills fires in February 2017. The Authority is satisfied that the system operator responded appropriately to these two events.
- 2.5 There were five under-frequency events during the review period. There is little the system operator can do to influence the number of under-frequency events that occur. The system operator can directly influence the power system response to under-frequency events.
- 2.6 The Authority has no concerns with the system operator's management of the power system events that are within the scope of this review.
- 2.7 During the last quarter of the review period security of supply started to become a concern due to low inflows into the southern hydro lakes. This concern is discussed below in paragraphs 2.17 to 2.21.

Implementation of the National Market for Instantaneous Reserve was successful

- 2.8 The system operator implemented National Market for Instantaneous Reserve (NMIR) in October 2016. NMIR significantly improves 'competition with security'. The Authority considers that the implementation was successful and comments more on this in paragraphs 3.6 to 3.11.

Security of supply and emergency management

The system operator should improve its security of supply function

- 2.9 The system operator's performance in the security of supply area was not as strong as the previous review period, with the system operator appearing to 'crank the handle'. The Authority believes the system operator could put more thought into how processes, and its work more generally, can be improved over time. Project management in the security of supply area has also not been as good as the strong project management shown in other areas of the system operator's work. However, the system operator has engaged well with industry on security of supply issues.
- 2.10 There are four areas of security of supply that we comment on in this review:
- (a) the review of the Security of Supply Forecasting and Information Policy (SOSFIP)
 - (b) hydro risk curve (HRC) updates
 - (c) the Security of Supply Annual Assessment
 - (d) the system operator's response to low hydro inflows during the 2017 autumn and winter.

The SOSFIP review was not delivered by the system operator

- 2.11 The system operator's statutory objective work plan for 2016-17 required it to deliver a SOSFIP review to the Authority by 13 March 2017. An administrative error by the system operator in tracking its deliverables meant it missed the completion date of 13 March 2017. The SOSFIP review was not delivered by the end of the review period (30 June 2017).
- 2.12 The Authority's biggest concern in relation to the SOSFIP review has been the system operator's lack of written communication to us on a revised delivery date. The review of the SOSFIP appeared to be poorly project managed with little progress having been made on the review before the agreed 13 March deadline. The Authority recommends that the system operator apply its otherwise good project management capability to its security of supply function.²

Greater transparency and timeliness required for hydro risk curve updates

- 2.13 The 2017 dry year highlighted that the industry did not have a good understanding of the HRC model and the assumptions that feed into it. The Authority acknowledges it is challenging to educate the industry about security of supply matters as such matters seldom command attention until security is threatened. Greater transparency of the HRC model would assist stakeholders to understand and check the inputs and assumptions influencing the model.
- 2.14 The Authority would like to see the system operator publish HRCs earlier—the 2018 HRCs were published too late for some parties that had already taken trading positions.

² Refer Recommendation 1, detailed after paragraph 2.21.

The system operator needs to improve its Security of Supply Annual Assessment

- 2.15 The system operator published its Security of Supply Annual Assessment (ASA) in February 2017. After publication of the ASA, the Authority expressed concerns to the system operator about the following issues:
- (a) The system operator largely replicates the previous year's ASA, with little evidence that it is thinking about who's reading the ASA and how it's being communicated.
 - (b) It appears the ASA demand forecasts are systemically biased high. This negatively affects the value of the ASA.
 - (c) The system operator has not provided adequate detail on its assumptions (such as whether the demand forecasts are P50 or P90), which means the Authority (and other stakeholders) do not have all the necessary information required to effectively assess forecasts against actual data.
- 2.16 The Authority considers the system operator can improve the quality of the ASA by:
- (a) moving to public data sets, open models and well-documented assumptions, so that stakeholders can run their own versions of the analysis to understand what it means for them
 - (b) providing two versions of the report—a more detailed version with full assumptions, and a simpler version that is accessible to the wider public, media and the minister
 - (c) ensuring that demand forecasts are as accurate as possible given the information that is available
 - (d) ensuring that the report formatting doesn't over-emphasise the most unlikely forecasts
 - (e) ensuring that the assumptions used are suitable for every scenario in which they are applied—such as base case estimates of the likelihood of generation being built not being used in a scenario in which the build likelihood would be materially different.

The system operator's response to low hydro inflows was acceptable in the circumstances, but the system operator needed to be better prepared

- 2.17 The Authority was generally happy with how the system operator responded to low hydro inflows during the 2017 autumn and early winter. The system operator released a broad range of information during the event, with an increased frequency of information release, including daily reports. The system operator also engaged well with the industry, including engaging particularly thoroughly on Meridian's contingent storage proposal.
- 2.18 However, the system operator did not appear as well prepared for this security of supply event as the Authority expected it to be.
- 2.19 Under the Emergency Management Policy (EMP) the system operator is required to prepare a funding application when controlled hydro storage is at or below the New Zealand or South Island 1% HRC. The Authority was satisfied with the system operator's funding application, but felt the system operator's proposed process for determining the trigger point for spending was poor and needed considerable rework. However, the Authority was satisfied with the eventual funding application and very pleased with the responsiveness of the system operator to its questions.
- 2.20 The system operator seemed under-prepared when it received Meridian's contingent storage proposal. This was potentially due (in part) to the system operator having not delivered the SOSFIP review.
- 2.21 The Authority recommends that the system operator ensure it is better prepared for any potential security of supply events in the future, particularly dry winters. The Authority acknowledges that such improvements are already underway, and that the system operator is devoting substantial resource to these improvements.

Recommendation 1: *Improve security of supply preparedness. With respect to its security of supply function, the system operator should:*

- *think more proactively and strategically about the needs of its security of supply function*
- *invest more in its capabilities for situations of security shortage, including plans and processes that are well documented and efficiently designed*
- *leverage its organisation-wide project management capability.*

The system operator is ensuring it is prepared for emergency management

- 2.22 The Authority commends the planning the system operator undertook to manage power system emergencies. This included plans for black start and system restoration, more comprehensive testing of black start services, and business continuity planning.

3 Demonstrating value-for-money

The system operator has made progress in responding to the Authority's recommendations in last year's review

- 3.1 The Authority recognises that the system operator has made progress towards meeting the four recommendations made in the 2015-16 review of the system operator's performance. However, the Authority considers that the system operator still has some work to do. Table 1 sets out last year's recommendations and the Authority's view on the system operator's response to them.

Table 1: System operator response to last year's recommendations

Recommendations in 2015-16 review of the system operator's performance	Authority's view on the system operator's response to recommendations
<i>Recommendation 1: Ensure that any recommendations of the post-project review of the PRISM SCADA upgrade are implemented, and that the Authority is informed about the implementation.</i>	The Authority commends the system operator for how it has applied the recommendations of the post-project review of the PRISM SCADA upgrade to the RTP project. The Authority looks forward to seeing further evidence of the PRISM SCADA recommendations being applied when the delivery team is established later this year.
<i>Recommendation 2: Work with the Authority to identify what information and indicators on financial performance should be included in future self-reviews.</i>	The system operator notes in its self-review that engagement with the Authority to establish financial reporting requirements is underway as part of the agreement to establish whether system operator cost-of-services reporting is feasible. The Authority is aware that cost-of-services reporting is a dependency for further development of financial indicators.
<i>Recommendation 3: Consider whether there would be value in further aligning the annual self-review and system operator service strategic plan, specifically by making an assessment against the intended activities expected to contribute to meeting the strategic plan's overarching goals.</i>	The system operator notes in its self-review that the annual self-review is now structured to directly reflect its strategic plan. However, the Authority notes that this is the third of the system operator's self-reviews that have been structured in line with the system operator's five strategic goals. The Authority's recommendation was that the system operator "consider whether there would be value in <u>further</u> aligning the annual self-review and system operator service strategic

	plan...". It is not clear to the Authority what the system operator has done to further this alignment. The Authority recommends the system operator assess its performance against the actions set out in its strategic plan (the relevant strategic plan being the plan the ends at the same time as the year in review). However, the Authority notes that this assessment may sit better outside the system operator's annual self-review rather than within it.
Recommendation 4: <i>Consider including information in future self-reviews that enables readers to assess the system operator's performance with respect to risk management and any planning to counteract an aging workforce.</i>	The Authority considers the system operator has successfully included information on any plans to counteract an aging workforce in this year's self-review. The system operator has included references to its risk management performance in a few areas within its self-review, including a new section on learnings from overseas events or trends. However, the self-review is not clear about what the system operator is doing on risk management in more general terms. The Authority would like the system operator's self-review to include an explicit statement on how the system operator is proactively managing risks.

Recommendation 2: *Consider assessing its performance against the actions set out in the strategic plan (the relevant strategic plan being the plan that ends at the same time as the year in review).*

Recommendation 3: *Consider including information in future self-reviews that enables readers to assess the system operator's performance with respect to risk management.*

Joint work planning has continued to operate well

3.2 Clause 7.7 of the Code requires the system operator and Authority to agree and publish a development programme that coordinates and prioritises:

- (a) the items on the Authority's industry development work plan on which the Authority intends to liaise with the system operator
- (b) the system operator's capital expenditure plan (capex plan) provided to the Authority under the SOSPA.

- 3.3 Joint work planning has continued to operate well. Joint work planning team meetings have allowed constructive discussions between the Authority and the system operator. The Authority considers the joint work planning a very valuable part of the Authority's and system operator's relationship.

The system operator has delivered commercial services of a high standard

- 3.4 In addition to providing funding to the system operator for performing its key role, the Authority also:
- (a) helps to fund developments to the market and market systems that are agreed under the Joint Development Programme
 - (b) procures the system operator's expert advisory services.
- 3.5 The Authority considers that the system operator delivered commercial services of a high standard over the review period. Projects were managed effectively with excellent communication and interactions between relevant parties. Overall, the system operator appeared more engaged than the previous review period, and provided constructive input into the projects it was involved in.

Capital project delivery has been successful overall

- 3.6 Capital projects are typically those that involve the development or maintenance of the market systems. Some of these are developments that support the Authority's market design projects, and some are developments that the system operator initiates and oversees.
- 3.7 The system operator generally has a good track record for delivering the Authority's market design projects, and this review period was no exception. The most significant capital projects during the review period were implementing the National Market for Instantaneous Reserve (NMIR) in October 2016, and implementing system changes required to reduce gate closure from two hours to one hour.
- 3.8 The Authority considers that the implementation of NMIR was successful.
- 3.9 However, just before implementation of NMIR the Authority discovered a risk of causing pricing problems should certain circumstances arise. The Authority and system operator accepted the circumstances were very unlikely to occur, and that the risk could be eliminated with a software release 30 days after implementation. Based on this, a joint decision was made for NMIR implementation to proceed. However, five days after NMIR implementation, the circumstances that had been considered unlikely occurred. As a result, there was a minimal impact on market prices for ten days.
- 3.10 The Authority considers the system operator appropriately responded to unrelated volatile pricing results following the implementation of the NMIR. Both the Authority and the system operator received complaints about the volatile pricing results. The system operator set up a meeting with the Authority to discuss the issue. Following the meeting the system operator undertook to educate stakeholders and it did so very successfully.
- 3.11 The system operator successfully implemented system changes required to enable gate closure to reduce from two hours to one hour.

TAS projects were well managed

- 3.12 The Authority procured the system operator's advice on development projects under the Technical Advisory Service (TAS) provisions of the SOSPA. The system operator has helped the Authority on ten pieces of work during the review period.

- 3.13 In general, the system operator has managed TAS projects well. In order to further enhance the consistency with which useful project deliverables are produced, the parties should share and compare their expectations by adopting a more iterative process when developing the scope and options of a project.
- 3.14 There were some minor disruptions to projects due to the system operator's restructure, but this was not a significant issue.
- 3.15 The system operator's work on real time pricing (RTP) was outstanding. The RTP project applied the relationship charter. There was a close collegial effort where differences of opinion were resolved readily, and the system operator kept the Authority well informed of developments. The system operator demonstrated project management, analytical, and technical skills of an excellent standard. The Authority commends the system operator for the quality of this project. It considers the approach taken in the RTP project should be applied to similar projects in the future.

Recommendation 4: ***Apply the successful approach taken in the RTP project to similar projects in the future.***

- 3.16 The system operator's work on the review of wholesale market trading arrangements was also of a high standard. The system operator prepared a very good report, which was completed on time and on budget. System operator staff were fully engaged and innovative in the way they presented material to the Authority.
- 3.17 The system operator made good contributions to other TAS projects.
- 3.18 The system operator also helped the Authority on four development projects during the review period:
- (a) efficient procurement of extended reserves
 - (b) gate closure
 - (c) extended reserve RMT (reserve management tool) update
 - (d) RTP consultation support.
- 3.19 There were some external challenges (not of the system operator's making) in the extended reserves projects that the system operator dealt well with. The system operator did everything it needed to do to ensure the extended reserves project progressed.
- 3.20 The gate closure development project was implemented successfully (as discussed above in paragraph 3.11), while the system operator's contribution to RTP was a highlight of the year (as discussed above in paragraph 3.15 and elsewhere).

The system operator has performed well in compliance-related areas

Principal performance obligations have been met

- 3.21 Clause 7.2 of the Code sets out the system operator's principal performance objectives (PPOs). The Authority is satisfied that, as required by the PPOs, the system operator:
- (a) avoided cascade failure of assets resulting in loss of electricity to consumers
 - (b) maintained frequency within specified levels (as set out in clauses 7.2A and 7.2B of the Code)
 - (c) managed frequency time error as required (as set out in clause 7.2C of the Code)

- (d) was not required to investigate and resolve a security of supply or reliability problem (as set out in clause 7.2D of the Code) as no requests were received from participants.³

The system operator has improved its compliance under the Code

- 3.22 The Code imposes compliance obligations on the system operator, including in documents incorporated into the Code by reference.
- 3.23 The system operator continued to be open and proactive in reporting breaches, and in communicating with the Authority to discuss compliance matters and issues of market behaviour.
- 3.24 Breach reports were good at providing necessary information and explanations, and in most instances, were timely. However, the Authority noted a few instances when the system operator was slow reporting breaches. The Authority encourages the system operator to make sure it has the processes in place for quick reporting of breaches while maintaining reasonable processes to filter out events that are not breaches. This will ensure that affected parties have the best opportunity to be part of the investigation and any remediation.
- 3.25 In its self-review, the system operator noted that it breached the Code 20 times during the review period, compared to 24 breaches in the previous 12 months (July 2015 to June 2016). This reduction in breaches was driven by reductions in process errors (from three to one) and manual errors (from 18 to 12), but partially offset by IT issues breaches increasing from three to seven. The number of modelling errors the system operator caused was also a significant reduced during the review period (from 12 down to four).

The system operator successfully reviewed documents incorporated into the Code by reference that do not relate to security of supply

- 3.26 The Code requires the system operator to regularly review a number of documents that are incorporated into the Code by reference.⁴
- 3.27 Section 2 of this review discusses documents incorporated into the Code by reference that relate to security of supply (the EMP, the SOSFIP and its associated ASA and HRCs). The Authority's view is that system operator's security of supply performance fell short of the Authority's expectations during the review period.
- 3.28 Outside of security of supply, the system operator delivered its policy statement review in May 2017. This review was of a good standard, with the system operator undertaking an appropriate level of consultation.
- 3.29 The Authority was also impressed with the quality of the system operator's work in undertaking the credible event review in late 2016. In particular, the Authority commends the system operator for its engagement with the Authority, and its innovative adoption of a staged approach (assessing assets by class in the first of a series of reviews).

³ Authority staff received verbal confirmation from the system operator on 29 November 2017 that it received no such requests. This is not recorded in the system operator's self-review.

⁴ Clauses 7.5(3), 8.10A, 8.42A, and 9.5(3) of the Code require the system operator to consult on revisions to the security of supply forecasting and information policy (SOSFIP), emergency management policy, policy statement, procurement plan, and system operator rolling outage plan (respectively).

Performance against performance metrics

- 3.30 The SOSPA requires the system operator and the Authority to annually agree a set of objective measures for the next financial year, against which the quality of the system operator's provision of the service will be measured.
- 3.31 The parties had agreed a performance metrics and incentives regime in June 2016. The system operator and Authority agreed on two objective performance metrics for the 16/17 financial year:
- (a) market benefits: at least \$1 million of market benefits released through the application of the CRE objective and/or implementing new capital investments
 - (b) participant survey: 77.5% of the participants responding to the system operator's annual participant survey rate the system operator's performance as 'good' or better.
- 3.32 The system operator's performance against those performance metrics determines the size and direction of the incentive payment.
- 3.33 The Authority is pleased the system operator met the first metric, and exceeded the second metric:
- (a) The market benefits performance metric was achieved primarily through Transpower implementing a system operator initiative to increase the HVDC pole 2 overload from 528 to 650 MW (received). This increase took effect on 30 November 2016. It reduced the Instantaneous Reserve (reserves) requirement for a pole 3 trip by up to 122 MW for a given HVDC transfer. Because of the co-optimisation of energy and reserves in the wholesale electricity market, this resulted in lower energy and reserve prices and costs.
 - (b) The system operator's customer satisfaction survey showed that 81% of respondents (compared to 75% last year) rated the system operator's service as 'very good' or 'good'.

4 Planning for tomorrow

The system operator has shown initiative in preparing for the future

- 4.1 In the previous review, the Authority considered the system operator was showing foresight in investigating and anticipating challenges to system operations, and opportunities that might arise from new technologies and changes in market conditions. This was apparent from its solar PV study, environment scan, and market systems roadmap.
- 4.2 This review period, the system operator continued to display initiative in considering how future industry change may impact on system operations. This is apparent in its continued work on the solar PV study and market systems roadmap, as well as its tighter grid management programme, situational intelligence programme, outage visualisation tool, and outage management process changes.
- 4.3 The Authority also applauds the work the system operator has done considering any lessons to be learnt from three overseas events or trends. The reports to the SRC and SOC on these events were of a high standard. The Authority encourages the system operator to continue to assess overseas and New Zealand-based events for any learnings that may help the system operator to manage and/or reduce future risks.

5 Strengthening relationships

System operator and Authority continue to have a strong working relationship

- 5.1 The relationship charter signed by the Authority and system operator in 2014 continues to support a strong working relationship between the parties. The relationship has continued to improve over the past few years, including a slight improvement in this review year relative to what was already a strong relationship in the previous review period. The relationship has generally been collegial, collaborative, and supportive. The system operator's senior management have supported and encouraged this.
- 5.2 System operator staff have generally raised issues in an appropriate manner when disagreements between the two organisations inevitably arise. In most cases, the Authority has been given opportunities for comment on projects. Occasionally, it has not been clear to the Authority whether the system operator has fully considered the Authority's comments. The national reserves and extended reserves projects are examples where such comments were made. While performance has been good, the Authority considers the system operator could improve the response it gives when it does not accept or act on the Authority's comments.
- 5.3 There have also been some instances where the system operator has failed to communicate effectively. The most significant of these instances was in relation to the review of the SOSFIP. After failing to meet the 13 March 2017 agreed deadline for delivering its review of the SOSFIP, the system operator did not clearly communicate to the Authority how it planned to remedy this, and when it would be able to complete the review by. The Authority also considers that communication and engagement between systems specialists within the two organisations is still an area that requires some improvement.
- 5.4 However, the Authority considers the system operator's communication was excellent overall. System operator staff have been willing to give Authority staff insights into the system operator's thinking about the future, which has been invaluable and constructive. System operator project managers have also been effective at keeping communication lines open and monthly management meetings have helped keep both organisations in the loop. The Authority also appreciated a one-off meeting with the system operator where entire teams met to gain a better understanding of each other's roles and priorities.

System operator has been proactive and engaged

- 5.5 The Authority has been pleased with the professionalism that the system operator has applied to its relationships with other stakeholders. More specifically, the Authority considers the system operator has interacted well with:
- (a) the SRC and SOC. The system operator was proactive—it thought about what work it was doing and whether it was relevant to the SRC and SOC and proposed some papers as a result. The system operator was also obliging at providing papers when requested (even at short notice) and all papers were of reasonable standard, with some papers being excellent.
 - (b) the Wholesale Advisory Group (WAG). The system operator's observer at WAG provided excellent and well-timed contributions, including providing any clarifications when requested. System operator presentations were of high quality and were well received by the WAG.
 - (c) the wider industry. The system operator engaged well with the industry both at workshops and in relation to Meridian's contingent storage proposal. The industry workshops held in September and April were of high quality and very professional.
- 5.6 The system operator's customer satisfaction survey showed that over half of the respondents rated the system operator's service as 'getting better' over the past six months. In addition, 81% of respondents (compared to 75% last year) rated the system operator's service as 'very good' or 'good'.
- 5.7 The Authority notes some fluctuations in responses to the survey but cannot determine whether these are genuinely reflective of system operator performance:⁵
- (a) While there was an increase in the percentage of respondents who rated the system operator's service as 'very good' or 'good', fewer respondents rated the system operator's service as 'very good'—down from 27% in 2015 to 19% in 2016.
 - (b) The 'competence' service area is the only service area that has shown a significant gain in respondents' ratings of performance—the percentage of respondents who rated the system providers service as 'good' or 'very good' fell or stayed the same for the other seven service areas. This is of particular concern for the service areas that were already some of the system operator's weakest performing areas—including 'empathy' and 'knowing the customer'.
- 5.8 The Authority is pleased to see the system operator's performance in the competence service area continues to be rated highly by respondents, with 89% of respondents rating the system operator's performance in this service factor as good or very good in 2017. This is particularly pleasing given this service area was of high importance to 90% of the survey respondents.

⁵ 61 customers responded to the 2016 survey. 34 responded to the 2015 survey. Given the small sample sizes, the Authority cautions against reading too much into the results.

6 Investing in good people

The quality and skill of the system operator staff was of a good standard

- 6.1 The Authority was impressed by the overall performance of the system operator's staff during the review period. The system operator role requires specialised staff with a range of skills and the Authority considers that the quality and skill of the system operator staff has been of a good standard. The system operator has also ensured they have provided the appropriate human resources for each task.
- 6.2 The system operator implemented a new organisational structure late in the financial year. This restructure appeared to be managed well with limited disruption to projects. It is too early to tell what effect the restructure will have, though the Authority has no concerns at this time.

The system operator needs to continue to improve the clarity of its reports

- 6.3 The system operator has continued to improve the clarity of its reports. Most written outputs are fit-for-purpose and system operator staff have generally been receptive to making changes in response to Authority feedback. Some of the system operator's reports necessarily cover very technical material, which will always be challenging to present in an accessible way. While the system operator has presented technical material well in some reports, other reports (particularly those that include economic analysis) could be better.
- 6.4 The Authority encourages the system operator to continue to improve the clarity of its reports, with key areas to focus on:
- (a) ensuring there is enough detail to limit misconceptions by stakeholders
 - (b) knowing who the audience is, and if the report is likely to be read by a range of people (with differing expertise in the material) that the executive summary provides a clear summary that is readable by different audiences
 - (c) improving its capability in the area of economic analysis, including cost benefit analysis.

Recommendation 5: ***Ensure that system operator improves its organisational capability for economic analysis, including cost benefit analysis.***

The system operator has improved its project management capability

- 6.5 A highlight of the year has been the system operator's continued improvement in its project management capability. Project managers have been actively involved in projects, ensuring that there are open and effective lines of communication, and have documented their processes well. This has led to projects running smoothly and to time. There has also been consistency between how different project managers report process, which has been helpful. Although project managers have followed their processes closely they haven't let this stifle progress – they have been flexible within reason.

7 Overall the system operator demonstrated continued improvement over the review period

- 7.1 The system operator has demonstrated a continued trend of improved performance over the review period.
- 7.2 The Authority values the increasingly collaborative working relationship it has with the system operator. Senior management at the system operator have practiced and promoted that style of relationship. The system operator delivered numerous outputs of an excellent standard over the review period, particularly in the RTP project. A highlight of the year has been the system operator's first-rate project management, which has ensured projects have run smoothly and to time.
- 7.3 The Authority notes that the review period was a challenging year for the system operator in regard to security of supply, and encourages the system operator to ensure it is better prepared for security of supply events in the future. The Authority acknowledges that such improvements are already underway.
- 7.4 The Authority believes the system operator is clearly focussed on how it can better support the long-term benefit of consumers, and looks forward to continuing to work with the system operator in achieving this objective.
- 7.5 Overall, the Authority is pleased with the system operator's performance over the review period.