Annual review of the system operator's performance

For the year 1 July 2017 to 30 June 2018

Final report

5 March 2019

Market Performance

Executive summary

This review of the system operator's performance is for the period 1 July 2017 to 30 June 2018.

We are pleased with the system operator's performance

We are pleased with the system operator's continued trend of improved performance. Most of the system operator's outputs have been of a high standard. Highlights include the system operator's work on real-time pricing (RTP) and load forecasting, the continued improvement in project management capability, and the collaborative working relationship with us.

But disappointed with its response to the 2 March AUFLS event

However, we have concerns about the system operator's response to the automatic under-frequency load shedding (AUFLS) event that occurred on 2 March 2017. We consider that the process undertaken by Transpower (as both grid owner and system operator) in response to this event lacked transparency, accountability, and thoroughness.

Some specific concerns with Transpower's response include it identifying some key facts late in the process, its joint investigation not being conducive to taking responsibility for failures, and failing to assess compliance for the event. Some of the failings in Transpower's process are likely due to the investigation involving both the grid owner and system operator. We note that the system operator has started making some positive changes in response to the event.

And concerned that closer Transpower integration risks reduced accountability

Transpower began a review of its operations. That review, and an initial structural change, would more closely integrate Transpower's grid owner and system operator roles. While we see some benefits of closer integration, we also see greater potential for conflicts of interest and muddied accountability to arise. As noted above, the 2 March 2017 event was an example of the separation of grid owner and system operator roles being unsatisfactorily managed.

We urge Transpower to remain cautious, open-minded and alert to risks of closer integration. Stakeholders need to be aware of such risks and help keep Transpower accountable.

The system operator met most of its performance metrics

We consider that the system operator met 83 per cent of the applicable performance metrics for the 2017-18 financial year, which is in excess of the 80 per cent target.

We have made recommendations for further improvement

We have made four recommendations to the system operator in this performance review:

Recommendation 1: *Ensure that it acts proactively and strategically when planning the needs of its security of supply function.*

Recommendation 2: *Ensure that it continues to improve its organisational capability for economic analysis, including cost benefit analysis.*

Recommendation 3: *Improve meaningful participation in customer satisfaction surveys.*

Recommendation 4: *Ensure conflicts of interest are well managed and highly transparent.*

Recommendation 5: *In next year's self-review include more insights and detail on how it plans to continually improve.*

We look forward to continuing to work with the system operator.

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1 Introduction

The system operator's role

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 manages the processes to meet demand at least cost. This is 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 us 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.

We have reviewed the system operator's performance

1.3 Part 7 of the Electricity Industry Participation Code 2010 (Code) requires us to regularly review how the system operator is performing its role. More detail on these requirements is set out in Appendix A. This review of the system operator's performance covers the year ending 30 June 2018.

1.4 The key inputs into this review were the system operator's self-review of its performance for the same period (self-review) and comments from:

(a) our staff who have worked with the system operator during the review period

(b) the Security and Reliability Council (SRC), based on a draft version of the executive summary of our annual review

(c) the System Operations Committee of the Authority Board (SOC), based on a draft version of our annual review

(d) the system operator, based on both draft and near-final versions of our annual review.

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

1.5 In conducting our review, we have aimed 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.

1.6 We have assessed the system operator's progress towards each of its five strategic goals (set out in its strategic plan) over the review period. These strategic goals are:

(a) demonstrating value for money

(b) playing an active role in shaping the industry's future

(c) delivering competition with security

(d) improving asset and infrastructure management

(e) developing organisational effectiveness.

2 Demonstrating value for money

The system operator showed initiative and provided high quality solutions and reports in projects. However, there is scope for improvement in its performance of service enhancement projects—particularly in terms of ensuring that the system operator keeps us suitably involved. The system operator also still has some work to do to meet some of our recommendations from last year's review.

The system operator met 83 per cent *of its applicable performance metrics, greater than the 80* per cent *required to trigger the maximum incentive payment. In line with its forecasts, system operator revenue reduced by $4.4 million to $40.8 million. Its regulatory profit (after tax) increased by $2.4 million to $7.3 million due to lower operating expenditure.*

We have recommended that the system operator ensure that it acts proactively and strategically when planning the needs of its security of supply function and that it continues to improve its organisational capability for economic analysis.

The system operator has made progress responding to last year's recommendations

2.1 The system operator has made some progress towards meeting the five recommendations made in the 2016-17 review of the system operator's performance. However, we consider that the system operator still has work to do. Table 1 sets out our view on the system operator's response to last year's recommendations.

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

Recommendations in 2016-17 performance review	Our view on the system operator's response to recommendations
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.*	We commend the system operator on the progress it has made on improving its security of supply preparedness. These improvements have been driven by improved project management capability and extra resources applied to the security of supply workstream. However, we would like the system operator to ensure that it does not lose sight of thinking strategically about the needs of its security of supply function. While the system operator's improved project management has helped the short-term process of getting projects completed on time, it has not helped focus the system operator on the medium- to long-term needs of the security of supply function and how these can best be met. We recommend the system operator ensure that it acts proactively and strategically when planning the needs of its security of supply function.

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).*	We note the system operator's commitment to working with us to ensure it meets this recommendation. We agree this sits better outside of the system operator's annual review and that it can be considered in the system operator's next iteration of its strategic plan.
Recommendation 3: *Consider including information in future self-reviews that enables readers to assess the system operator's performance with respect to risk management.*	We consider the system operator has successfully included information on the system operator's risk management performance in this year's self-review.
Recommendation 4: *Apply the successful approach taken in the RTP project to similar projects in the future.*	We commend the progress the system operator has made in this area. The system operator has displayed a high standard of project management in nearly all projects and has continued to develop a collaborative relationship with us.
Recommendation 5: *Ensure that system operator improves its organisational capability for economic analysis, including cost benefit analysis.*	We consider that improving the system operator's capability for economic analysis is a work in progress. We were disappointed with the quality of the economic analysis for the dispatch service enhancement (DSE) project, but were impressed with the thoroughness of the economic approach taken in the credible event review. We recommend that the system operator continue to work on improving its organisational capability for economic analysis, including cost benefit analysis.

Recommendation 1: ***Ensure that it acts proactively and strategically when planning the needs of its security of supply function.***

Recommendation 2: ***Ensure that it continues to improve its organisational capability for economic analysis, including cost benefit analysis.***

Joint work planning has continued to operate well

2.2 Clause 7.7 of the Code requires the system operator and Authority to agree and publish a Joint 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 system operator service provider agreement (SOSPA).

2.3 Joint work planning has continued to operate well, with joint work planning team meetings running very smoothly with constructive discussions. We continue to consider

the joint work planning as a very valuable part of our relationship with the system operator.

The system operator has delivered commercial services of a generally high standard

2.4 In addition to providing funding to the system operator for performing its key role, we also:

(a) help to fund developments to the market and market systems that are agreed under the Joint Development Programme

(b) procure the system operator's expert advisory services.

2.5 We consider the system operator delivered commercial services of a generally high standard over the review period. The system operator has continued to manage projects effectively, and generally works collaboratively with us to get the best outcome.

Service enhancement projects have scope for improvement

2.6 The DSE project is the first service enhancement project under the new SOSPA. We have been impressed by the system operator's interactions and communication with industry on this project, especially at industry briefings.

2.7 However, the system operator's performance in some other aspects of the DSE project has been unsatisfactory. In particular:

(a) Our staff felt resistance to their involvement in the project.

(b) Our requests for information have required substantial follow up to ensure the request is actioned, and when requests are responded to the response is often inadequate.

(c) The system operator surprised us at an industry briefing by informing the industry that initially there wouldn't be any internet-facing web services for existing dispatch products. This was despite us asking the system operator for information on the design of the service and details of the internet-facing web services before the industry briefing.

(d) The quantification of benefits in the cost benefit analysis was poor. The cost benefit analysis needed significant rework to adequately represent the true net benefits.

2.8 We were pleased with the updated design the system operator provided us at a comprehensive design briefing between the two parties. This design briefing resolved our concerns about the scope of internet-facing web services.

2.9 While we have had some concerns about the system operator's performance on the DSE project, we note that as this is the first service enhancement project it is not unreasonable that there are some teething issues. We hope that these issues will be smoothed out for the next service enhancement project.

Capital project delivery has been successful overall

2.10 Capital projects are typically those that involve the development or maintenance of the market systems. Some of these are developments that support our market design projects, and some are developments that the system operator initiates and oversees.

2.11 The system operator has successfully delivered capital projects during the review period.

The system operator's performance on technical advisory services (TAS) projects has been excellent

2.12 We procured the system operator's advice on development projects under the TAS provisions of the SOSPA.

2.13 The system operator's performance on TAS projects has been excellent—the system operator has shown initiative, provided quality solutions and reports, and has managed the TAS projects effectively.

2.14 The system operator's work on RTP continued to be a highlight. There continued to be a collegial relationship between us and the system operator on this project and the system operator worked constructively with us to work through key design issues. The system operator was focussed, took initiative, communicated clearly, and generally put lots of resources and effort in to the market design for RTP. The system operator planned ahead by bringing other analysts onto the project to reduce reliance on key people.

2.15 We are pleased with the initiative the system operator showed in its support on the improvements to the load forecast. This initiative led to the system operator making some useful discoveries (around its IT capability). A very comprehensive TAS report was delivered and included a work programme for improving the system operator's load forecast.

2.16 The system operator also made excellent contributions to work on supporting normal frequency management and on the initial assessment of battery storage technology as instantaneous reserve providers. The system operator came up with a workable solution to a technically challenging issue in the normal frequency management project, and delivered reports to a high standard in the battery storage technology project.

2.17 We commend the system operator on its excellent performance on TAS projects in the 2017-18 financial year.

The system operator met 15 out of 18 applicable performance metrics

2.18 The SOSPA requires the system operator and 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.

2.19 The parties agreed a performance metrics and incentives regime in June 2017 for the 2017-18 financial year. We agreed with the system operator on six critical success factors and 19 performance metrics to measure the system operator's performance against. The system operator's performance against those performance metrics determines the size and direction of the incentive payment.

2.20 We consider that only 18 of the 19 performance metrics are applicable for measuring the system operator's performance over the 2017-18 financial year. The performance metric for on-time special event preliminary reports was not applicable because the system operator was not required to prepare any special event preliminary reports over the review period.

2.21 Table 2 sets out the system operator's results against the performance metrics for the 2017-18 financial year.

Table 2: System operator's performance against the performance metrics

Metric	Target	System operator view of performance	
		Actual	Pass/fail
System operator customers are informed and satisfied			
Participant survey result	≥ 79%	93%	Pass
Participant survey response rate – online	≥ 20%	7%	Fail
Participant survey response rate – first tier	≥ 80%	100%	Pass
On-time special event preliminary reports	90% ≤ 10 business days	N/A	N/A
Edge technology report	≥ 1/year	1	Pass
Market insights report	≥ 5/year	15	Pass
System operator maintains Code compliance and meets SOSPA obligations			
Market impact of breaches	≤ 1/year > $50k	0	Pass
On-time Code/SOSPA deliverables	100%	46	Pass
We deliver projects successfully			
Service maintenance project delivery	≥ 60%	33%	Fail
Market design/service enhancement project delivery	≥ 60%	100%	Pass
System operator is committed to optimal real-time operation			
Infeasibility resolution	100% ≤ 2 business days	100%	Pass
Infeasibility resolution	80% ≤ 1 business day	100%	Pass
High spring washer resolution	100% ≤ 2 business days	100%	Pass
High spring washer resolution	80% ≤ 1 business day	100%	Pass
System operator's people are engaged and competent			
Staff engagement score	≥ 68%	68%	Pass
System operator's tools and technologies are fit for purpose			
Capability functional fit	73%	67%	Fail
Technical quality	50%	60%	Pass
SCADA/MS availability	99.9%	100%	Pass
On-time schedule publication	99%	100%	Pass

2.22 We agree with the system operator that it failed to meet three of the performance metrics. With respect to those failures:

(a) The survey response rate failure tells us virtually nothing about the system operator's performance. Its importance lies in enhancing confidence that the

results of the customer survey can be relied on as an indicator of the system operator's performance. This matter is discussed further in paragraph 3.8.

(b) The service maintenance project delivery metric, like the market design/service enhancement metric, provides an indicator of the system operator's forecasting accuracy given a range of factors. Those factors include the system operator's own systems and personnel capability, and predicting the future priorities of the Authority. The failure was based on the system operator not meeting time and budget requirements for two out of three projects. The target was 60% which required the system operator to meet time and budget for two out of the three projects.

(c) The capability functional fit failure was slight (six percentage points below the target of 73 per cent). Persistent failure of this metric would be of concern and likely manifest in the medium-term as higher-cost projects where tool or system changes are included.

2.23 We consider the system operator met 15 of the 18 applicable performance metrics. That is an 83 per cent success rate, which is in excess of the 80 per cent rate required to trigger the maximum incentive payment to the system operator. We congratulate the system operator for this result and looks forward to further refinement of the performance metrics.

The system operator has continued to meet its auditing obligations

2.24 The system operator has met its:

(a) Code obligations to undertake audits of its key market systems software (Scheduling Pricing and Dispatch (SPD), and the Reserve Management Tool (RMT))

(b) SOSPA obligations to undertake business assurance audits of various aspects of its service.

2.25 We are confident the system operator approaches its audits in a diligent and pragmatic manner that improves the value of audits.

The system operator increased regulatory profit and reduced revenues

2.26 The system operator provided audited financial information as an addendum to its annual self-review of performance. The system operator's 2017/18 financial year had a number of large differences compared with recent history (highlighted in Table 3 overleaf).

Table 3: Significant changes to system operator's financial information in 2017/18

Financial measure	Changed by ($M)	Changed to ($M)	Per cent change	Reasons for change
Revenue	$4.4 ⬇	$40.8	10% ⬇	Recovery of costs of the previous refresh of the market system[1] tapers off over time, reducing revenues. This significant decline in revenue was largely forecast.
Operating expenditure	$1.6 ⬇	$20.6	7% ⬇	Lower salary costs resulting from: (i) vacant positions taking longer to fill with suitable candidates (ii) fewer positions (iii) some vacancies being filled with lower-remunerated employees. Changes in information technology systems reducing associated licencing requirements. Insourcing some aspects of the enterprise service bus support.
Depreciation	$4.8 ⬇	$9.7	33% ⬇	The assets created by the previous refresh of the market system were fully depreciated in 2016/17. This is the primary reason depreciation fell so much in 2017/18.
Regulatory profit (after tax)	$2.4 ⬆	$7.3	49% ⬆	The calculation of regulatory profit includes revenue, operating expenditure and depreciation. Decreases in operating expenditure and depreciation resulted in this increase. The decrease in revenue mitigated the extent of this increase.

[1] Transpower delivered a major refresh of the system operator's market system earlier in the decade. The market system is the suite of software used to deliver core system operator functions. The major refresh was delivered as one massive project (really a suite of projects) that concentrated costs over the following ten years. The system operator's current approach refreshing the market systems is to do so incrementally, treating the market system as a set of modular parts. This should mean revenue (and depreciation) is more evenly spread in future.

2.27 Furthermore, the system operator's 'vanilla' return on investment increased substantially from 16 per cent to 28 per cent. This was caused by a combination of:

(a) the seven per cent decrease in operating expenditure set out in Table 3

(b) a 43 per cent decrease (decreased by $5 million to $6.5 million) in assets purchased or commissioned during the year.

2.28 We are satisfied the SOSPA incentivises the system operator to improve efficiencies and enables consumers to benefit from such improvements in the long-term. 2017/18 is the second financial year in the first five-year period under the SOSPA.

(a) The system operator's revenue is incremented annually by the consumer price index minus an offset (a 'CPI minus X' approach). This means that within each five-year period, the system operator's regulatory profit will tend to reduce if its operating costs rise faster than the consumer price index minus the offset.

(b) If the system operator implements efficiencies over that needed to maintain its regulatory profit, the system operator retains the benefit of those reductions in operating expenditure during the then-current five-year period. Every five-year reset, revenue is renegotiated in light of actual performance (such as enduring reductions in operating expenditure).

3 Playing an active role in shaping the industry's future

The system operator has shown initiative in considering how emerging technology may impact on the system operator's role and has been proactive in outage planning.

There has continued to be a collaborative working relationship between the system operator and us—with the system operator prepared to listen, engage constructively, and respond well to criticism. However, there have been some instances where the system operator's communication with us has been ineffective.

The system operator has built constructive and helpful relationships with other stakeholders.

We have recommended that the system operator improve meaningful participation in customer satisfaction surveys.

The system operator has shown initiative in preparing for the future

3.1 The system operator continued to display initiative in considering how future industry change may impact on system operations. This is apparent in various pieces of work the system operator did on emerging technology and the potential impact on the system operator's ability to operate a stable power system. This has included:

(a) investigating the impact of a significant increase in electricity generated from solar photovoltaic panels on the power system and starting to investigate various energy storage scenarios on the power system's performance.

(b) near the end of the review period, publishing a paper on New Zealand's energy future as part of its 'Te Mauri Hiko – Energy Futures' work.

3.2 We also commend the system operator for its work on outage planning, including development of an outage planning visualisation tool and commencing a review of its outage planning policy.

The system operator's working relationship with us has continued to grow

3.3 The relationship charter signed by the Authority and system operator in 2014 continues to support a strong working relationship between the two parties. The relationship continued to grow over the 2017-18 financial year, and generally is as strong as it's ever been.

3.4 Engagement between the two parties was generally positive over the review period, with the two parties willing to listen to each other's point of view and engage constructively. The system operator also responded well to criticism.

3.5 There have also been some instances where the system operator failed to communicate with us effectively. The system operator needs to ensure that the collaborative and open relationship that we and system operator generally have flows through into all aspects of the system operator's role.

(a) In the DSE project the system operator was uncooperative, leading to DSE interactions between the system operator and us being strained at times. We also didn't receive standard monthly project reporting on the DSE project.

(b) The system operator's communication with us was also poor during the post-event review of the 2 March 2017 AUFLS event—the system operator (with the exception of real-time operations staff) was generally unhelpful and unresponsive, and the reporting lacked transparency.

3.6 Nonetheless, we consider the system operator's communication was effective overall. System operator project managers have engaged proactively with our staff, while regular meetings between senior management were helpful for addressing any project challenges and issues as they arose.

System operator has engaged constructively with other stakeholders

3.7 We have been pleased with the constructive relationships the system operator has developed with other stakeholders. More specifically, we consider the system operator has interacted well with:

(a) the SRC and SOC. The system operator's primary representative on the SOC was a great ambassador for the system operator—he answered questions constructively, provided lots of useful information, and took criticism well. The system operator provided reports of good quality at short notice and worked constructively with us to adapt papers when necessary.

(b) the Market Development Advisory Group (MDAG). The system operator's observer at MDAG was excellent. He provided high-quality advice when needed without over-powering MDAG's discussion.

(c) the wider industry. The system operator engaged well with the industry on the DSE project—this included valuable industry briefings and some useful websites showing technical detail in an easy-to-understand manner.

3.8 The system operator's customer satisfaction survey showed that 93 per cent of survey respondents (compared to 81 per cent last year) rated the system operator's service as 'very good' or 'good'. However, we caution reading too much into this result as only 16 customers responded to this question, compared to 59 customers for the 2016-17 financial year.

3.9 We are disappointed with the small response rate (seven per cent) to the online customer satisfaction survey, particularly as a response rate of at least 20 per cent was one of the agreed performance metrics for the 2017-18 financial year. However, we note that focussing on the response rate only can be problematic—it is a combination of both the quantity and quality of responses to the customer satisfaction survey that is important. We recommend that the system operator consider how it can improve meaningful participation in future customer satisfaction surveys.

Recommendation 3: Improve meaningful participation in customer satisfaction surveys.

4 Delivering competition with security

We were disappointed with the process undertaken by Transpower in response to the 2 March 2017 AUFLS event. The process lacked transparency, accountability, and thoroughness. Some of the failings in Transpower's process are likely due to the investigation involving both the grid owner and system operator.

The system operator has improved its security of supply preparedness. However, it still needs to act more proactively and strategically when planning the needs of its security of supply function.

The scope and quality of the system operator's initial SOSFIP review appeared to suffer from insufficient resources. But we were impressed with the sensible economic approach taken by the system operator in its credible event review.

The system operator responded to operational events competently

4.1 There were no particularly significant power system events during the review period. There were several weather-related system events, but we are happy that these events had no ongoing or profound impacts and were dealt with acceptably by the system operator.

4.2 There were five under-frequency events (UFE) that were considered during the review period—two UFEs on 2 March 2017, and one on each of 11 June 2017, 15 June 2017, and 9 February 2018.

4.3 We have no concerns with the system operator's management of the UFEs that occurred on 11 June 2017, 15 June 2017, and 9 February 2018, or of the second UFE that occurred on 2 March 2017 (at Aviemore). The system operator's reporting of these UFEs was clear and we agreed with the system operator's findings.

4.4 However, we do have some concerns with the system operator's handling of the first UFE that occurred on 2 March 2017. These concerns are dealt with separately in the following section.

We have several concerns about the system operator's response to the 2 March 2017 AUFLS event

4.5 On 2 March 2017 there was a significant power system event where coincident transmission circuit disconnections led to the separation of the South Island into two electrical systems.

4.6 Following the event, Transpower (both as the system operator and the grid owner) investigated what happened, determined lessons that could be learnt, and determined what actions were required as a result. Transpower released its final report on the event just after the end of the review period (9 July 2018), but most of the analysis and investigation of the event occurred during the 2017-18 financial year.

4.7 We have several concerns with the system operator's response to the 2 March AUFLS event over the 2017-18 financial year. These concerns are that:

(a) Transpower's initial investigation failed to identify some important matters, with some key facts (such as how dispatch occurred) not discovered until late into Transpower's investigation.

(b) Draft versions of Transpower's report on the event were not transparent or candid and did not seem to reflect the views expressed by operations staff earlier in the process.

(c) Transpower took too long to complete its investigation and publish its final report on the event.

(d) Transpower's joint investigation and reporting was not conducive to:

(i) discovering and describing the system operator's view of the event

(ii) taking responsibility for failures—the grid owner and system operator were hesitant to make the other part of the organisation accountable for errors.

(e) The system operator's chain of reasoning for why there was no causer of the first UFE (a conclusion that we did not share) lacked justification.[2]

(f) In April 2018 (13 months after the event) the system operator admitted they had not assessed compliance for the event, despite this being a requirement of the SOSPA and clause 94 of the system operator's policy statement.

(g) The system operator did not self-report a breach in relation to the event. The system operator has advised it intended to complete assessment and reporting of breaches upon finalisation of the event report. The system operator acknowledges the breaches should have been assessed and reported earlier.

4.8 Overall, we were disappointed with the process Transpower undertook in response to the 2 March 2017 AUFLS event. We consider the process lacked transparency, accountability, and thoroughness. Some of the failings in Transpower's process are likely a result of the combined nature of the response, with Transpower's investigation involving both the grid owner and system operator.

4.9 We want to ensure that the industry is aware that there are risks associated with Transpower taking an integrated approach (as both grid owner and system operator) and that the industry needs to help keep Transpower accountable.

4.10 The system operator is making positive changes in response to the 2 March 2017 AUFLS event review.

(a) Transpower is making progress against the 13 actions arising from the 2 March 2017 AUFLS event review.

(b) The system operator's response to the identification in April 2018 of incorrect HVDC 'i-limit' information from the grid owner appears to provide some anecdotal support for improved aspects of post-event reporting and role accountability.

The system operator has improved its security of supply preparedness, but needs to improve further

4.11 In last year's system operator performance review we noted that the system operator did not appear as well prepared for the low hydro inflows during the 2017 autumn and early winter as we expected it to be.[3] We recommended in the 2016-17 performance review

[2] We acknowledge that identifying the causer of an under-frequency event is dependent upon interpreting poorly-written parts of the Code.

[3] Electricity Authority, *Annual Review of the system operator's performance: for the year 1 July 2016 to 30 June 2017*, March 2018, paragraph 2.18.

that the system operator improve its security of supply preparedness.[4] Table 1, on page 5, sets out our view on the system operator's performance against this recommendation.

4.12 Overall, the system operator has improved its security of supply preparedness since last financial year, and we acknowledge the resources the system operator has put into improving in this area. Project management in the security of supply area has improved substantially on the previous financial year, and the system operator has been well prepared for security of supply meetings, answered questions knowledgably, and been willing to talk over issues.

4.13 However, we consider that the system operator still needs to think more proactively and strategically about the needs of its security of supply function. While the system operator's improved project management has helped the short-term process of getting projects completed on time, it has not helped focus the system operator on the medium- to long-term needs of the security of supply function and how these can best be met. For this reason, we have recommended that the system operator ensure that it acts proactively and strategically when planning the needs of its security of supply function.[5]

4.14 We acknowledge that the system operator has started developing a security of supply strategy that considers what the security of supply function may look like in the future. We look forward to seeing the outcome of this work.

The system operator is ensuring it is prepared for emergency management

4.15 We commend the system operator on the continued planning it undertook to manage power system emergencies. This included black start testing, system restoration workshops, and business continuity planning.

Aspects of the SOSFIP review were of poor quality

4.16 Aspects of the system operator's initial review of the security of supply forecasting and information policy (SOSFIP) were disappointing, though delivered on time in March 2018.

4.17 The scope and quality appeared to suffer from insufficient resources, despite the system operator having been given an extended timeframe. For example, the system operator failed to address concerns that we raised on earlier versions of the SOSFIP, such as a lack of detailed modelling and a reliance on illustrative charts rather than results from a model. We also specified some detailed things we wanted the system operator to look at in the review, including the rationale for why they include the lakes that they do, but this didn't happen.

The system operator made some improvements to its ASA, but further improvements needed

4.18 The system operator made some improvements to its Security of Supply Annual Assessment (ASA) in the 2017-18 financial year following feedback by us in last year's

[4] The full recommendation is included in Table 1 on page 5.

[5] See recommendation 1 on page 6.

system operator performance review.[6] The ASA conveyed the necessary messages to the right people, without unnecessarily alarming non-industry people.

4.19 However, we consider further improvements to the ASA are needed. There continues to be a lack of transparency on what the system operator uses for its demand forecasts and more generally the demand-side appears to receive less attention than the supply-side. We also continue to be concerned that the ASA doesn't have the level of quantitative rigour that it should.

We were impressed with the system operator's credible event review

4.20 We were impressed with the credible event review published by the system operator, especially with the sensible economic approach taken.

[6] Electricity Authority, *Annual review of the system operator's performance: for the year 1 July 2016 to 30 June 2017*, March 2018, page 11.

5 Improving asset and infrastructure management

We consider Transpower's new divisional structure may help improve the system operator's asset and infrastructure management.

The system operator's realigning of its operational focus from reliability to resilience is a positive step and will enable future benefits.

The system operator took some steps to prepare for the future

5.1 The system operator has continued to prepare for the future through its restructure, investigation of evolving technology, and reviewing its capital expenditure investment roadmap.

5.2 We consider Transpower's new divisional structure may help improve the system operator's asset and infrastructure management and we look forward to seeing evidence over the next few years. However, we note that under the restructure there may be greater scope for conflicts of interest—this is discussed further in section 6.

5.3 We applaud the system operator for investigating use of evolving technology in modelling and forecasting.

We commend the system operator on its focus on resilience

5.4 The system operator continued to realign its operational focus from infrastructure reliability to infrastructure resilience over the review period. We consider that the system operator's work on this realignment is positive and is an enabler of future benefits. In addition, Transpower's new divisional structure (discussed further in section 6) gives weight to the system operator's operational and infrastructure planning capability.

6 Developing organisational effectiveness

The system operator's new divisional structure may enhance the system operator's operational and infrastructure planning capability, but it needs to ensure it has processes in place to deal with any conflicts of interest that may arise.

The system operator's staff are helpful and prepared to listen, and its project managers have engaged positively and effectively with us.

The system operator performed well in compliance-related areas, other than its failure to self-report any breaches for the 2 March 2017 AUFLS event.

We have recommended that in next year's self-review the system operator include more insights and detail on how it plans to continually improve.

The system operator's new divisional structure increases our concerns about potential conflicts of interest

6.1 Transpower began a review of its operations. The findings of that review would improve efficiency and more closely integrate Transpower's grid owner and system operator roles. In April, Transpower created a new Operations Division that delivers both system operator services and some grid owner services. We understand Transpower's reasoning for this restructure and (as discussed in section 5) believe it can enhance the system operator's operational and infrastructure planning capability.

6.2 However, with system operator services and grid owner services both provided by the Operations Division, there is greater scope for conflicts of interest to arise.

6.3 Transpower needs to ensure that it follows good processes to deal with any potential conflicts of interest (between the system operator and grid owner). We urge Transpower to be cautious, open-minded and alert to risks of closer integration. Furthermore, it must manage its conflicts of interest in a highly transparent manner to promote its own accountability.

Recommendation 4: ***Ensure conflicts of interest are well managed and highly transparent.***

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

6.4 We continued to be impressed by the overall performance of the system operator's staff during the review period. The vast majority of staff were always prepared to listen, be helpful, and flexible.

6.5 In most cases the system operator resourced projects and functions appropriately. However, the system operator needs to ensure that core competencies, such as security of supply, continue to be resourced adequately.

6.6 In general, system operator staff have the skills required to effectively perform their roles and have suitable expertise in its traditional areas of core engineering competencies. We are concerned that the system operator may not have as much economic capability as ideal—this is touched on below.

6.7 We note that near the end of the financial year there was a small cluster of human errors that led to some breaches and pricing errors. The system operator needs to ensure that a pattern does not emerge.

The system operator has improved its project management further

6.8 The system operator continued to improve its project management capability over the review period. Most project managers have proactively engaged with both system operator and our staff to ensure issues are addressed. This has resulted in open and effective lines of communication.

6.9 The system operator improved its project management for its security of supply function, so that it meets the high standard set in other system operator projects. We encourage the system operator to continue to strive for a high standard of project management in all its projects.

The system operator needs to make further improvements in its economic analysis

6.10 In the 2016-17 review of the system operator's performance, we recommended that the system operator improve its organisational capability for economic analysis, including cost benefit analysis.

6.11 The quality of the system operator's economic analysis during the review period has been mixed. The quantification of benefits in the cost benefit analysis undertaken for the DSE project was poor—the cost benefit analysis needed significant rework to adequately represent the true net benefits. However, we were impressed with the economic approach the system operator applied to the credible event review.

6.12 We have recommended that the system operator continue to improve its organisational capability for economic analysis, including cost benefit analysis.[7]

The system operator's self-review should better distil insights for future performance

6.13 The system operator's self-review of its performance should be a key input into developing and improving the system operator's organisational effectiveness in the future. The system operator's self-review set out how it considered it performed against its performance metrics and strategic goals.

6.14 However, we consider the self-review should also identify the insights that will determine the system operator's future focus for continuous improvement. Such insights might be examples of:

(a) success that need to be celebrated, repeated and ingrained into performance

(b) failures that need to be remembered and avoided in future.

6.15 We recommend that the system operator's self-review for the next financial year contain more insights and detail on how it is going to continue to improve its performance.

[7] See recommendation 2 on page 6.

Recommendation 5: ***In next year's self-review include more insights and detail on how it plans to continually improve.***

The system operator has performed well in compliance-related areas

Principal performance obligations have been met

6.16 Clause 7.2 of the Code sets out the system operator's principal performance obligations (PPOs). We are 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.

The system operator has improved its compliance under the Code

6.17 The Code imposes compliance obligations on the system operator, including in documents incorporated into the Code by reference.

6.18 In its self-review, the system operator noted that it breached the Code 12 times during the review period, compared to 20 breaches in the previous financial year.

6.19 There was one major breach during the review period concerning the processing of some dispatchable demand bids at Norske Skog. This was a systematic problem that had been present for several years. The system operator worked co-operatively on the investigation into this breach and no settlement was needed.

6.20 We noted in last year's review of the system operator's performance that there were a few instances when the system operator was slow reporting breaches.[8] We consider there has been some improvement in reporting of breaches due to learnings from the 2 March 2017 AUFLS event.

The system operator didn't self-report any breaches for the 2 March 2017 AUFLS event

6.21 We are concerned that the system operator didn't self-report any breaches for the 2 March 2017 AUFLS event. After we alleged twelve breaches in May 2018 the system operator admitted four of these.

The system operator reviewed documents incorporated into the Code by reference that relate to security of supply

6.22 The Code requires the system operator to regularly review various documents that are incorporated into the Code by reference.[9]

6.23 The system operator reviewed the SOSFIP and its associated ASA and hydro risk curves (HRCs) during the financial year. Section 4 of this review discussed the system

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8 Electricity Authority, *Annual review of the system operator's performance: for the year 1 July 2016 to 30 June 2017*, March 2018, paragraph 3.24.

9 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 SOSFIP, emergency management policy, policy statement, procurement plan, and system operator rolling outage plan (respectively).

operator's security of supply performance, including its review of the SOSFIP, ASA and HRCs.

6.24 Under the policy statement, the system operator must also review the identification, assessment, and assignment of potential credible events not less than once in each period of five years.[10] The system operator completed a review of credible events at each bus in June 2017. The quality of the system operator's credible event review was discussed in section 4 of this review.

[10] See clause 13.1 of the Policy Statement.

Appendix A Requirements for system operator performance review set out in the Code

A.1 Requirements for the Authority's review of the system operator's performance are set out in Part 7 of the Code. In particular:

(a) Clause 7.8 of the Code requires that the Authority undertake a review at least once each financial year, concentrating on the system operator's compliance with:

(i) its obligations under the Code and the Electricity Industry Act 2010

(ii) the operation of the Code and the Electricity Industry Act 2010

(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 SOSPA

(ii) reports from the system operator to the Authority, specifically including the system operator's annual self-review, which it is required to perform each year under clause 7.11 of the Code, and provide to the Authority by 31 August

(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 impacted on 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.

A.2 As set out in the Electricity Industry Act 2010, the Authority has a statutory objective to "promote competition in, reliable supply by, and the efficient operation of, the electricity industry for the long-term benefit of consumers".