Meeting Date: 6 August 2020

TRANSPOWER'S COMMUNICATION OF REDUCED SECURITY AND OUTAGES

SECURITY AND RELIABILITY COUNCIL

This is the summary of the SRC discussion of Transpower's communication plan for reduced security and outages, including responses from Transpower regarding their handling of specific reduced security and outage incidents.

Contents

1. Background

1.1 The SRC secretariat's work on a risk management framework identified that the communication preparedness of the Electricity Authority (Authority) and Transpower were important for minimising the adverse impacts of various supply shortages.

1.2 At the 12 March 2020 meeting, a paper was presented which detailed Transpower's plans and practices for outage and reduced security.[1] That paper included a summary of Transpower's then-new (created October 2019) external communications plan (plan). The SRC expressed a desire to have confidence that the plan achieves its goals.

1.3 Also at the March meeting, the SRC discussed the Wellington Region N-Security Review provided by Transpower[1]. During the verbal discussion with Transpower, some inconsistencies were noted between the discussion and report.

1.4 An action item from the March SRC meeting was to develop a set of questions in relation to Transpower's communication of reduced security and outages.

1.5 At the 12 May 2020 meeting, the proposed questions were presented and discussed, and the result of this was a finalised set of questions to be presented to Transpower, so the issue could be wrapped up at this meeting.

1.6 The SRC has not yet issued any advice to the Authority on either the Wellington n-security event or the communication of reduced security and outage situations.

1.7 The minutes from prior meetings is included as Appendix B.

Previous discussion on the Wellington N-security event

1.8 Previous discussion on the Wellington event included a specific concern about the asymmetric line swing and whether this has been encountered before.

1.9 A broader discussion followed about whether outage planning followed good industry practice in this instance. The secretariat noted at the meeting that any participant that believed the grid owner had breached the Code could allege a breach to the Authority's compliance team. No breaches have been alleged in connection with this issue to date.

Previous discussion on Transpower communication

1.10 Most discussion on outage communication had a customer focus, such as where one may find information regarding outages. Some consideration was given to risk allocation in planning for outages and how that was managed.

1.11 The discussion served to inform the questions asked of Transpower by the SRC.

[1] 12 March 2020 papers are available from https://www.ea.govt.nz/development/advisory-technical-groups/src/meeting-papers/2020/src-meeting-12-march-2020/

2. Questions from the SRC to Transpower

2.1 From the discussion at the 12 May 2020 meeting, the series of questions was redrafted and sent to Transpower from the SRC.

2.2 The questions were:

2.2.1 Had Transpower encountered asymmetric conductor span swing before? The report provided by Transpower asserted it was unaware of any, though a representative in the meeting indicated they thought there had been one.

2.2.2 What is the process followed by Transpower to identify when the risk (probability and consequence) of non-supply to consumers of unplanned grid maintenance is unacceptably high? Is there a (formal or informal) net benefit test applied? Should the SRC feel confident that what consumers regard as an unacceptable risk is well aligned with Transpower's assessment of unacceptable? Does Transpower have examples of where it has taken exceptional steps when consumers were faced with an exceptional risk?

2.2.3 Could Transpower provide an example of when a stakeholder has challenged a planned/proposed outage (through the annual outage plan), requiring Transpower to undertake a net benefit test? How do Transpower's net benefit tests estimate outage costs to consumers?

2.2.4 Please select an incident (or more than one[2]) to demonstrate how communication of reduced security and outages have actually operated since the new external communications plan has been released and properly embedded in business-as-usual processes. For the incident(s):

2.2.4.1. What communications did Transpower issue?

2.2.4.2. Did Transpower receive any feedback on its communications? If so, what?

2.2.4.3. Did Transpower's communication since the plan's introduction meet the goals of the plan?

2.2.4.4. If not, what changes did Transpower make to ensure its communications meet the goals of the plan, and have these changes worked?

2.2.4.5. Is there anything further Transpower will do differently or any changes it intends to make to the plan for next time as a result of this incident?

3. Transpower's response

3.1 The questions and responses from Transpower are included as Appendix A. Highlights and the secretariat's comments are included below.

[2] The scenarios posed were:

- Planned reduction of security
- Planned outage
- Unplanned reduction of security
- Unplanned outage

3.2 Transpower's response was thorough and, in the secretariat's view, provided adequate scenarios to demonstrate their use of the communications plan.

3.3 Transpower's answer to the question regarding asymmetric conductor span swing confirmed that they have no evidence of having encountered this issue in the past.

3.4 The secretariat notes that the description of the process for planned outages was detailed and robust.

3.5 Transpower's description of the process for unplanned maintenance was less detailed. The secretariat infers from this that the urgent nature of unplanned maintenance means stakeholders are dependent on Transpower exercising good judgement about when more detailed analysis of risks is warranted.

3.6 A challenge inherent to assessing the risk of both planned and unplanned maintenance is the accuracy with which probability of failure can be estimated. The probabilities involved are virtually always very low but can have very wide margin of error. With the benefit of hindsight, event investigators can uncover connections/relationships that reveal the actual probability of failure was much higher than expected.

3.7 Transpower's answer to question four demonstrates that they are communicating with the larger EDBs and providing them with the opportunity to receive additional information or provide feedback into the planning process. EDBs take up these opportunities at different rates depending on the needs of their network.

4. Questions for the SRC to consider

Q1. Transpower's response to question two identifies scenarios where a Service Contingency and Risk Mitigation Plan is prepared. Does the SRC consider the settings triggering a plan to be appropriate?

Q2. What further information, if any, does the SRC wish to have provided to it by the secretariat?

Q3. What advice, if any, does the SRC wish to provide to the Authority?

5. Appendices

Appendix A: Transpower response to questions from Security and Reliability Council

Appendix B: Minutes from previous meetings

Appendix A

Transpower response to questions from Security and Reliability Council

Transpower response to questions from Security and Reliability Council

1) Had Transpower encountered asymmetric conductor span swing before? The report provided by Transpower asserted it was unaware of any, though a representative in the meeting indicated they thought there had been one.

   Our engineering and operational staff are not aware of any asymmetric conductor swing issues occurring previously on Transpower lines assets during reconductoring work. As we noted in the report to the SRC in February, this span is long and straddles a valley. The hazard arose due to the different behaviour of the new and old conductor in certain wind conditions, creating a flash over risk. Enquiries with our international peers through technical networks such as CIGRE resulted in a blank. Peer organisations are generally able to undertake double circuit reconductoring works with both circuits de-energised given the higher level of redundancy built into their networks.

2) What is the process followed by Transpower to identify when the risk (probability and consequence) of non-supply to consumers of unplanned grid maintenance is unacceptably high? Is there a (formal or informal) net benefit test applied? Should the SRC feel confident that what consumers regard as an unacceptable risk is well aligned with Transpower's assessment of unacceptable? Does Transpower have examples of where it has taken exceptional steps when consumers were faced with an exceptional risk?

   Unplanned maintenance only occurs where there has been an equipment failure or there is an urgent defect that poses a significant risk to supply. Restoration is managed based on impact and availability of other circuits or assets to back feed and provide load.

   For planned outages, Transpower's outage process begins with customer visits over the January-March period to discuss the next year's draft outage plan (1 July to 30 June). The plan is issued to connected parties on the 19th May each year. Following issuing the outage plan, any change, including additional outages, is notified to the affected customer(s).

   Six weeks out from the planned outage start, the customer is re-notified of the pending outage. At all these stages of engagement, discussions take place in respect of the timing of the outage and the risk of the timing on the customers network. Outages can then be moved and rescheduled following these discussions to minimise risk. Flexibility reduces in our ability to change outages the closer to the outage start. In practice, changes do occur to mitigate risk right up to the day, especially where weather is a factor, ie. lightning raises risk levels.

   A Service Contingency and Risk Mitigation Plan is prepared (and can be shared with customers) for all outages where:
   a. There is n-security for a load or generator of 50MW or more during the outage with a recall time of 4 hours or greater;
   b. There is n-security and the consequences of a loss of supply to a customer is significant or deemed unacceptable, or there are significant outages in IONS.
   c. There is a planned loss of supply to a customer.
   d. An outage window should not proceed if a significant safety risk exists and has not been mitigated.

   These criteria align with our triggers for customer and community communication for outages.

Weekly reports of 'Significant Outages in the Next Ten Weeks' identify the instances when risk mitigation measures/plans are required in changing sites from n-1 to n-security. We use a Service Specification on Contingency and Risk Mitigation – Service Requirements (TP. SS 07.56) to define the criteria and procedures for planning and implementing work on grid equipment and systems - to ensure that associated risks are effectively addressed.

Based on the experience of our regional teams, we identify outages which while not meeting all the above criteria, would still benefit from a risk mitigation plan. We have been working over the last 2 years to improve our risk mitigation plans for outages.

3) Could Transpower provide an example of when a stakeholder has challenged a planned/proposed outage (through the annual outage plan), requiring Transpower to undertake a net benefit test? How do Transpower's net benefit tests estimate outage costs to consumers?

As noted above customers do regularly request changes to planned outages, either through our annual consultation, or as we make changes to the outage plan. We coordinate with them where we can and where it is appropriate. A formal request for a net benefit test (under the process detailed in the Outage Protocol) only happens after we have pursued extensive discussions and after an initial formal representation is made for us to reconsider the outage.

In the last two years we have had two formal requests for net benefit tests both by generators. In the same period, we have had more formal representations mostly from one generator, concerning 21 outages. A typical example of the generator's concern is around the outage potentially causing market constraints, particularly at a time when we may see adverse market conditions. For all these outages, the generator has either accepted that the outage needs to go ahead, or Transpower has rescheduled work considering the costs and benefits of doing so, and it has not been necessary to complete a full cost-benefit analysis. We have not had a formal request for a net benefit test from a distributor or directly connected customer.

The costs and benefits of an outage that are considered in the net benefit test are set out in the Outage Protocol (which is incorporated into the Code by reference) – these include the costs and benefits to Transpower, distributors, retailers or generators (difference in production costs) as well as consumers. For consumers, the outage costs include elements such as:

- *the cost of actual or potential unserved energy (for outages which reduce security to N, this would be a probability-weighted cost of unserved energy in the event customers suffered a loss of supply) and*
- *extra costs associated with potentially more costly generation.*

Avoided unserved energy costs (through maintenance), is considered a benefit.

4) Please select an incident (or more than one*) to demonstrate how communication of reduced security and outages have actually operated since the new external communications plan has been released and properly embedded in business-as-usual processes. For the incident(s):
   a) What communications did Transpower issue?
   b) Did Transpower receive any feedback on its communications? If so, what?
   c) Did Transpower's communication since the plan's introduction meet the goals of the plan?
   d) If not, what changes did Transpower make to ensure its communications meet the goals of the plan, and have these changes worked?

e) Is there anything further Transpower will do differently or any changes it intends to make to the plan for next time as a result of this incident?

In addition to our outage communications and notifications as noted above, we publish a 10-week forward view of outages on our website. This shows, for each customer, which points of service may experience either a planned loss of supply or a reduction in security as a result of planned outages.

Planned outage example:
Transpower has a large project on at Karapiro involving planned outages affecting Hinuera substation – this in turn impacts Tirau, Matamata and Putaruru. The first outage was scheduled for 9 February 2020 and was planned for 12 hours from 5:00am – 5:00pm.

We worked closely with PowerCo on this outage. Advertising was via Facebook, radio and newspaper from mid-December, with more detailed information provided on the Transpower website. Engagement with consumers was ongoing prior to Christmas on Facebook, email and phone calls.

Following feedback from the community, the project revisited and re-planned work to be done on the day. This enabled the outage to be shortened to 10 hours, with the timing shifted to 8:00am – 6:00pm. Moving the timing and reducing the time required avoided impacting two milkings. Key stakeholders were advised directly including Fonterra, Federated Farmers and Councils. We worked with Federated Farmers to develop specific messaging and advice on animal welfare – this was provided on our website and was linked via our Facebook posts. Facebook, radio and newspaper advertising occurred again in the lead up together with engagement of local media. PowerCo met with retailers, who communicated directly with their customers (consumers.) We continued to respond to several consumer queries and concerns via phone calls, emails and Facebook. PowerCo posted an 'am I affected' tool on their website and this was shared via Transpower channels.

On the day of the outage, we provided regular posts to Facebook with updates on work progress and expected return to service timing, together with responding to comments and messages.

PowerCo's feedback on the process was supportive on following up – we jointly ran the same process again in June for the second outage.

One learning has been better streamlining our communications timing with retailers so we aren't operating ahead of them – this was exacerbated for the February outage by wanting to notify early given people could be away over the Christmas-January period. Another challenge has been ensuring full contact with the community – with feedback saying some had found out via their neighbour as they don't get the paper, don't listen to the radio and don't have Wi-Fi.

We have subsequently discussed this scenario with our Consumer Advisory Panel (CAP) – feedback from them was supportive. CAP members suggested consideration of direct communication with community groups such as local Marae and via Community Networks Aotearoa.

Planned reduction of security examples:
To date since implementing our updated External Communications policy we have had no reduced security events where our customers wished to communicate with their customers (as per our policy explained in the February SRC paper). Planned work resulting in a reduction to n-security has triggered conversations with Communications Managers from seven EDBs since the revised was approved. To date:

- *five have confirmed they did not want to pursue any community communication regarding outages.*
- *two of the five also clarified they are happy for this arrangement to stand for the next 12 months, and that there is no need to re-engage each time an outage is planned that reduces security to N.*
- *the remaining two did not respond to requests as to whether they wished to proceed with community communications.*

Those EDB's contacted to date in this regard include Aurora, Eastland, Northpower, PowerNet, Top Energy, Unison and Vector.

In addition to the above process, we also use our operational experience to identify outages which while not meeting some or all criteria, would still benefit from discussing with the relevant customer (this could be to do with the type of outage or the risk sensitivity of the customer). This has occurred a few times since our updated External Communications Policy was approved, for example for reduced security of supply at Gracefield following a fault, for fault testing as part of the control system replacement on the HVDC and for transformer maintenance at Wilton impacting security to customers fed by the 33 kV bus at this site.

Unplanned event example:
Late last year we had a loss of supply event in Northland, resulting from bird streaming, where the Bream Bay-Huapai 1 circuit was out of service for planned maintenance/project work. The circuit tripped and did not auto-reclose, with circuit breakers at Kaikohe subsequently tripping, causing loss of supply to parts of Northland. Immediately after the tripping, while the cause was being investigated, the Northland contingency plan was initiated which involves starting to restore Northland using the 110kV network from Wellsford. This continued until the 220kV network was available. The table sets out the maximum duration at the 3 affected GXP's.

Grid exit point	MW affected	Max Interruption Duration	System minutes
Maungatapere	83.4 MW tripped	91 minutes	1.167
Kaikohe	48 MW tripped	101 minutes	0.707
Bream Bay	50 MW tripped	72 minutes	0.549
Total	**181.4 MW tripped**		**2.423 system minutes**

During the event we communicated with affected customers at several levels and with emergency services, in line with our operating policies. The National Grid Operations Centre (NGOC) control room was in contact with the Northpower and Top Energy control rooms at various times throughout the event, starting with advising them of the event together and notification to the Police. Transpower management were in contact with customer management to provide updates as information became available. This information supported Northpower's local media updates. Ongoing updates were posted on our Facebook page to inform the public of known information and best estimates of restoration times. We also responded to media questions as they were received.

This incident received media attention - the following day Alison Andrew fronted an interview with Radio New Zealand and Mark Ryall, GM Grid Delivery, did a television interview. We also issued a press release identifying the likely cause of the event as bird streaming and responded to print media enquiries subsequent to this press release.

Subsequent to the event, key operational management met with our customers, and their large industrial customers to discuss the event and understand the impacts on stakeholders. The meeting

was hosted by Northpower in Whangarei and included Transpower customers – Northpower and Top Energy, Ngawha generation (embedded generator) and large end users (NZ Refining, Fonterra, Golden Bay Cement, Affco meat processing, Juken NZ, and others from timber processing and manufacturing industries). The meeting provided an opportunity for Transpower to explain the unplanned interruption and the actions taken both during and after the event, and to discuss the follow up work underway. It provided an opportunity for stakeholders to explain the impact of interruptions on their businesses, including the impact of communications prior to outages and during unplanned interruptions, with discussion on how such impacts might be mitigated in future. The meeting was constructive, and the engagement has continued as we work through issues relating to enabling auto-reclose on these circuits during outages.

Appendix B: Minutes from previous meetings

March 2019

8. Action list and updates

8.6. The group noted the actions and that:

8.6.1. the hydrological situation has changed considerably since the paper was written and is no longer poor

8.6.2. the secretariat should prepare a paper to explain the hydro risk curves

8.6.3. the 'mean storage' figures on the hydro risk curve chart vary, which suggests they are rolling means

8.6.4. the grid security situation in Wellington during the current grid maintenance of the Wilton-Central Park transmission lines highlights the importance of grid redundancy, planning of outages and implications of an elevated terror alert status.

1. Action: Secretariat to prepare a paper that explains what the hydro risk curves represent and how they work.

2. Action: Secretariat to prepare a paper that explains what the grid reliability standards are and how they were derived, how they are used, how n-security outages are decided upon and planned for, and includes any available data on the uses of n-security and any related lessons learned.

August 2019

8. System operator business continuity and incident management

8.5. Members noted:

8.5.1 restoration of generation plant can be a hard-to-predict factor in restoring after an incident

8.5.2 shorter staff employment tenures in modern workplaces tend to increase the frequency with which exercises need to be undertaken

8.5.3 two instances where Transpower (particularly the grid owner) outage planning and communication was unsatisfactory

8.5.4 their lack of confidence in the process for scheduling transmission outages to minimise the economic and social impacts of transmission asset failures at times of reduced transmission security

8.5.5 two instances where Transpower considered not communicating risks as they judged it could be harmful to communities and policing costs

8.5.6 with the development and ubiquity of mobile phones, there is potential for consumer-driven reporting of outages to augment industry-driven reporting.

8.6. The SRC agreed to advise the Authority:

8.6.1 the system operator self-assesses the maturity of its incident management to be 'developing'

8.6.2 Transpower should involve a broader set of stakeholders (such as industry, police, emergency management groups, major electricity users and community representatives) when developing its communications plans because:

8.6.2.1 it is important that Transpower does not make assumptions about what information stakeholders would want prior to or during an outage

8.6.2.2 Transpower communicates using mediums that consumers see and media report against, and this can set consumer expectations

8.6.2.3 Transpower needs to ensure it has effective communications with relevant parts of the industry supply chain so that there is an effective ability to communicate consistent information to stakeholders.

8.7. The SRC directed its secretariat to ensure that a proposed future paper about the communications plans of the Authority and Transpower include information about communication of restoration times and any decisions to withhold information.

October 2019

8. Transmission security

8.6. The secretariat introduced Ross Parry to speak on its behalf and guide the SRC's discussion. The secretariat's representative spoke to the slides provided.

8.7. Members asked the secretariat various questions about length of outages, scheduling of outages, case studies and major events.

8.8. The SRC Chair twice asked Transpower representatives if the asynchronous swinging of Wilton-Central Park conductors should reasonably have been anticipated. Transpower representatives gave more context to the circumstances without directly answering the question.

8.9. A member asked Transpower representatives if the level of investment in transmission network resilience is economically appropriate. A Transpower representative responded that investment needs are quite granular and Transpower aims to incorporate studies of the value of lost load in different locations. Transpower offered to present to a future meeting on the studies of the value of lost load. The secretariat noted this topic is on the SRC's planned agenda in 2020.

8.10. After the Transpower representatives left the room, the SRC noted errors in paragraphs 4.2.8 and 4.2.9 of the secretariat's report and agreed to provide advice to the Authority that:

a) The SRC is supportive of the Commerce Commission's new requirement to require Transpower to report on the time that the transmission network spends in n-security state, and would like to see the data that eventually comes out of that.

b) Regulatory arrangements promoting secure transmission investment should be reviewed as there are opportunities for improvement.

c) The SRC will receive further relevant information in future papers on:

   i. Transpower's communication plans and practices for reduced security situations, outages and security of supply emergencies

   ii. Authority and Transpower studies into the value of lost load

   iii. Transpower's challenges with reconductoring projects.

d) The SRC will provide advice to the Authority about the Wellington n-security issue once the above papers have been presented.

March 2020

13. Review of circumstances of March 2019 Wellington n-security

Raewyn Moss joined the meeting.

13.1 The Chair noted:

a) an updated and corrected paper was provided to members yesterday. Changes were made to account for the most recent correspondence on the matter and to correct a mischaracterisation of Transpower's view

b) that SRC member Greg Skelton has an interest in this matter in his capacity as Chief Executive of Wellington Electricity

c) that this matter has been discussed before and that it was previously put to the Authority Board, who asked the SRC to review the situation and report back to the Authority.

13.2 Transpower representatives presented an overview of the report and then invited questions.

13.3 Members asked a variety of questions including whether Transpower are satisfied with the current communication plan, and what rights customers have in these types of projects.

13.4 The secretariat asked a Transpower representative to reconcile their oral statement that Transpower had encountered asymmetric line swing before with section 4.3 of Transpower's report that states the opposite. The Transpower representative undertook to investigate and advise the SRC's secretariat.

13.5 The secretariat asked whether Transpower identified any other tacit assumptions in other parts of its grid development planning. A Transpower representative responded that many lessons have been learned and Transpower is confident asymmetric line swing would be assessed appropriately in future grid works.

13.6 While not in scope of Transpower's or the secretariat's paper, several members considered it likely that the grid owner's outage planning was not in accordance with good electricity industry practice. The secretariat noted that any participant that reasonably believed the grid owner had breached Part 8 of the Electricity Industry Participation Code could allege a breach to the Authority's compliance team.

13.7 The SRC agreed to provide interim advice to the Authority that it will seek additional information before it can provide substantive advice on this agenda item.

13.8 The SRC directed its secretariat to:

a) investigate an incident that occurred after the new communications plan was developed (see paragraph 14.6 below for examples)

b) circulate a list of questions amongst the SRC and when confirmed send to Transpower to answer

c) prepare to have this matter concluded at the next SRC meeting.

3. Action: Secretariat to investigate an incident that occurred under Transpower's new External Communications Plan and develop a list of questions to pose to Transpower.

John Clarke joined the meeting

14. Transpower and Authority communication plans and practices for reduced security, outages & security of supply emergencies

14.1 Transpower representatives provided an overview of the paper they produced then welcomed questions from the members.

14.2 Members asked various questions about Transpower's outage protocol and external communications plan, and where customers can find outage information.

14.3 The secretariat asked about security reporting to the Commerce Commission.

14.4 Transpower representatives expressed concern about potential misinterpretation of data: that consumers might overestimate probability of failure during N security, that the distributor might be able to reconfigure their network such that an outage at a nearby GXP doesn't necessarily mean a given customer will lose power.

Raewyn Moss, Stephen Jay and John Clarke left the meeting

14.5 Due to the linkages with agenda item #13, the SRC agreed to provide interim advice to the Authority it will seek additional information before it can provide substantive advice on this situation.

14.6 The SRC directed the secretariat to provide a paper to the following meeting that assesses how Transpower performed relative to its new communications plan in a recent incident (possible examples are Rangitata River Floods December 2019, Auckland CBD January 2020, Northland November 2019). This is recorded in action #5 above.

May 2020

12. Developing questions for Transpower about its communication of reduced security and outages

12.1 The secretariat explained part of the associated action was not completed due to the pandemic, but this discussion should help ensure this topic can be wrapped up at the August SRC meeting.

12.2 The secretariat noted the information in brackets in paragraph 2.2.4 and 2.2.5 should have been removed.

12.3 Members made various comments around the proposed questions including it was expected that the scope of the questions be beyond just communication, and if they should be asking about risk allocation by doing certain works and how that is discussed in the design and planning stages.

12.4 Members commented the uncertainty around whether a specific span incident had occurred before the Wellington incident had not been addressed.

12.5 The SRC directed its secretariat that:

a) the SRC would like to have additional questions beyond just communications added, particularly around security and the unanswered span query. It also needs to cover the identified gap in risk planning - when does a plan change so that n-security doesn't occur (ie consideration of cost to customers).

b) the revised questions should be sent out to members along with the minutes from this meeting.

c) there needs to be a timeframe given with an aim to complete this at the next SRC meeting.

4. Action: Secretariat to circulate revised. questions amongst members along with Meeting 31 minutes