

## TECHNOLOGY AND INFORMATION SECURITY

## SECURITY AND RELIABILITY COUNCIL

This paper introduces papers and presentations on the theme of Technology and Information Security. The secretariat has been asked to provide the SRC with material to support this expanded theme and build upon the SRC's previous focus on participant cyber-security.

**Note:** This paper has been prepared for the purpose of the Security and Reliability Council (SRC). Content should not be interpreted as representing the views or policy of the Electricity Authority except where specifically noted.

# Technology and Information Security

## 1. Introduction

- 1.1. The SRC has asked the secretariat to provide information on Technology and Information Security, as part of the theme for this meeting. The SRC includes this theme as an expansion from its previous focus on cyber-security.
- 1.2. In previous years the cyber security theme has centred on aggregated results, analysis and learnings arising from a survey sent to participants on their level of cyber preparedness. After two consecutive years of surveys the SRC decided not to conduct a survey of participants, instead preferring to focus on Market Operations Service Providers (MOSPs), including Transpower.
- 1.3. The purpose of this theme is to give the SRC a better understanding of how MOSPs, contracted by the Authority, approach and manage Technology and Information Security. As part of the theme, members will hear from the MOSPs, as well as industry experts, a participant, and the Authority. Presentations will also cover recent issues and roles performed by other agencies. The SRC also has an opportunity to provide input into research being conducted on cyber-information sharing and the benefits and barriers.
- 1.4. This information will enable the SRC to advise the Authority on where there may be gaps, where additional resources may be needed and potential opportunities for collaboration and efficiencies and to reduce risk.
- 1.5. This paper introduces papers and presentations from:
  - a) InPhySec (on issues and recent themes)
  - b) Transpower (covering the system operator, grid owner and FTR Manager)
  - c) NZX (as Clearing, Reconciliation and WITS Manager)
  - d) Jade (as Registry Manager)
  - e) The Authority (on frameworks and MOSP monitoring)
  - f) Mercury NZ (case study)
  - g) Jeff Whitty (Principal Advisor at the Infrastructure Commission) on cyber-security information sharing.
- 1.6. Presenters (a-d above) were asked to consider the following issues, as they relate to the electricity sector:
  - a) How they approach technology and information security in their work as a MOSP
  - b) What work have they done in this area over the last 12 months, what are they currently focusing on and what are their future intentions
  - c) Any areas where they look to other entities to perform a role - this will help the SRC identify gaps
  - d) Including suggestions about other initiatives (incl. from overseas)
  - e) Any other areas that would help inform the SRC as to how they manage technology and information security.

1.7. The following section sets out information about the presentations (noted in paragraph 1.5 above) appended to this paper.

## 2. InPhySec

2.1. InPhySec operates as an independent entity, providing cyber and related advice across the public and private sectors since 2015.

2.2. InPhySec supported the SRC's previous work on cyber-security, through question generation for surveys, aggregation and analysis of results and advice.

2.3. A representative from InPhySec will provide the SRC with a scene-setting presentation covering:

- What are the biggest issues impacting technology and information security
- What learnings are available from recent events and initiatives and practices overseas
- How InPhySec works with entities to support robust and effective technology and information security practices
- What resources may be available for (particularly the electricity sector) entities to use to support best practice
- Whether the existing regulatory framework supports best practice and whether any changes should be considered
- Opportunities for broad sector collaboration
- What support and guidance regulators could/should offer participants
- Any other guidance or suggestions for power system managers to support best practice technology and information security

2.4. As an independent expert in Technology and Information Security, the InPhySec presenter will remain for the other MPSO sessions and the SRC wrap-up session. This will enable the InPhySec presenter to provide members with an independent assessment of the MOSPs presentations, answer member's questions, and assist members to provide advice to the Authority.

2.5. InPhySec's presentation is included as Appendix A to this paper.

## 3. Transpower/EMS

3.1. Transpower is a State-Owned Enterprise that owns the national grid. The Authority (separately) contracts Transpower to perform the role of system operator.

3.2. The system operator coordinates electricity supply and demand in real time, in a manner that avoids fluctuations in frequency and disruption of supply.

3.3. The system operator determines the optimal combination of electricity generators and reserve providers for each half-hour trading period. The system operator then instructs generators on when and how much electricity to generate and manages any events that cause the supply-demand balance to be disrupted.

3.4. Transpower's business group entity Energy Market Services (EMS) provides "a multi-faceted range of products and services, focusing on the provision of efficient data management and market solutions for private and public sector clients in the New Zealand."

3.5. The Authority contracts Transpower (through EMS) as the Financial Transmission Rights (FTR) Manager, responsible for:

- Creating inter-island FTR's
- Allocating FTR's to industry participants via auction
- Managing the FTR register, in which all FTR's are publicly listed
- Registering parties who wish to participate in FTR auctions
- Undertaking other activities associated with operating, promoting and developing the FTR market

3.6. Transpower has a centralised "Information Services and Technology" group that provides these services to all of Transpower, including EMS. Transpower/EMS's presentation is included as Appendix B to this paper.

## 4. NZX

4.1. New Zealand stock exchange (NZX) formed in 1983 operates New Zealand's equity, funds, derivatives energy and carbon markets. The Authority contracts NZX as the WITS, clearing and reconciliation managers for the New Zealand electricity market.

4.2. The role of the clearing manager is to invoice industry participants by combining reconciled quantity information (provided by the reconciliation manager) with half-hourly pricing information (from the clearing manager), to determine the amounts owed to and by each industry participant.

4.3. The role of the reconciliation manager is to receive and process large quantities of electricity meter data on a monthly basis. They are responsible for reconciling this data against all quantities of electricity conveyed to purchasers and all quantities of electricity supplied by generators. They scale, calculate and allocate unaccounted for electricity.

4.4. The role of the wholesale information and trading system (WITS) manager is to run the WITS, as a central facility for the receipt and publication of information between, and on behalf of, buyers and sellers in the wholesale electricity market.

4.5. Another important function of WITS is to send compliance information to the Authority to monitor that participants are adhering to the electricity industry participation code (the Code). Monthly reports include service levels against targets, fault response and resolution times.

4.6. NZX's presentation is included as Appendix C to this paper.

## 5. Jade

5.1. Jade Software Corporation (Jade) is a software development company, based in Christchurch, providing business intelligence and software development managed services among a suite of other specialties.

5.2. The Authority contracts Jade as the registry manager. The registry manager is responsible for:

- Maintenance and validation of installation control point (ICP) information, both current and historical, via online and batch functions
- Notification facility that advises all affected participants of changes made to ICP information

- Delivery mechanism for the switching protocols
- Provision of ICP look-up facilities to authorised participant, both online and in batch mode
- Provision of compliance reporting

5.3. Jade also performs monthly software maintenance reviews to ensure registry user issues are addressed and resolved in a timely manner.

5.4. Jade's presentation is included as Appendix D to this paper.

## 6. Authority's monitoring of MOSPs

6.1. The Authority contracts MOSPs to provide a range of services for participants, the broader sector and end consumers. An important aspect of the contract is the Authority's monitoring of MOSPs to ensure they are carrying out their functions efficiently and helping facilitate market development.

6.2. The secretariat has asked the Authority to provide information on the monitoring framework, how it monitors MOSPs and their approach to technology and information security.

6.3. The aim is to provide the SRC with information about current state, so it can consider the frameworks in place and whether they are appropriate to support best practice policies and procedures.

6.4. The Authority's presentation is included as Appendix E to this paper.

## 7. Case study – Mercury's cyber-security journey

7.1. The SRC asked the secretariat to include in the agenda a case study related to the theme for this meeting. Mercury NZ has agreed to provide a case study on their cyber-security journey.

7.2. Mercury's presentation is included as Appendix F to this paper.

7.3. The representative from Mercury will attend remotely and be available for questions.

## 8. Research – cyber-security information sharing

8.1. An opportunity has arisen for the SRC to input on current research into the benefits and barriers of cyber-information sharing.

8.2. Jeff Whitty, Principal Advisor (Policy) at Te Waihanga, the New Zealand Infrastructure Commission, provides the Government with advice on energy policy. While new to the energy sector, his role draws on 20 years' experience working in engineering, project management and public sector roles. Jeff is pursuing a Masters of International Security (Massey) where his research has examined the benefits and barriers that constrain cyber-information sharing among New Zealand's electricity sector operators.

8.3. The secretariat considered this work aligned with the technology and information security theme and offers a good opportunity for the SRC to consider the preliminary findings and input into the research prior to publication.

8.4. Jeff Whitty has kindly agreed to present his preliminary findings and discuss them with the SRC at this meeting.

- 8.5. Members are encouraged to consider additional areas of focus or methodology, ask questions, and provide feedback.
- 8.6. The presentation and related paper are included as Appendices G1 and G2 to this paper.

## 9. Questions for the SRC to consider

The SRC is asked to consider the following general questions.

- Q1. What further information, if any, does the SRC wish to have provided to it?**
- Q2. What gaps, overlaps or inefficiencies need to be addressed and by whom?**
- Q3. What additional information-sharing across the sector is desirable to support best practice technology and information security?**
- Q4. What other opportunities are available to uplift sector performance in this area to support a secure and reliable electricity supply to consumers?**
- Q5. What advice, if any, does the SRC wish to provide to the Authority?**

- 10. Appendix A: InPhySec presentation**
- 11. Appendix B: Transpower/EMS presentation**
- 12. Appendix C: NZX presentation**
- 13. Appendix D: Jade presentation**
- 14. Appendix E: Authority presentation**
- 15. Appendix F: Case Study – Mercury NZ**
- 16. Appendix G: Preliminary research findings - cyber-security information sharing presentation**