

A risk management framework

A proposed risk management framework for major security- and reliability-related risks

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Executive summary

The function of the Security and Reliability Council (SRC) is to provide advice to the Electricity Authority (Authority) on the performance of the electricity system and the system operator, and reliability of supply issues. The SRC has previously considered the structures through which the electricity industry manages supply reliability risks. This paper considers how a risk management framework might be used by the SRC to assist it in identifying, communicating and advising on major security and reliability risks.

The paper considers relevant guidelines for risk management and how security and reliability risks are considered in electricity supply businesses. A concept level design of a Risk Management Framework (RMF) for the SRC is discussed and initial worked example provided.

The SRC secretariat considers that the use of a RMF can assist the SRC in undertaking its role and provide benefits through its application in the broader risk management process. For example, the RMF could improve the communications between risk owners and stakeholders and allow risks arising from multiple triggers to become more visible.

The development of criteria for probability and consequence of identified risks will enable the SRC to better define and prioritise the security and reliability risks that fall within its purview.

This paper seeks the SRC's views on the potential usefulness and value that the RMF could provide and whether to request that the Authority develop the RMF further.

1 Introduction

1.1 Purpose of the paper

- 1.1.1 The Security and Reliability Council (SRC) has been appointed, in accordance with the Electricity Industry Act 2010 (Act), to provide independent advice to the Electricity Authority (Authority) on:
- a) the performance of the electricity system and the system operator; and
 - b) reliability of supply issues.
- 1.1.2 The SRC has previously considered the structures through which the electricity industry manages supply reliability risks. Previous papers considered by the SRC include:
- a) Supply reliability risk management (May 2012)
 - b) The Electricity Authority's role in reliability (August 2012)
 - c) Supply-side reliability – credible event data (August 2012)
 - d) Reliability dashboard and reliability-centred monitoring (May 2013)
 - e) Reliability-centred monitoring (February 2014)
 - f) Transpower event review (February 2014)
 - g) Reliability monitoring in the electricity sector (June 2014)
 - h) Reliability Risk Framework (September 2014).¹
- 1.1.3 This paper draws from and builds on the past papers and SRC discussions to consider a framework through which major security and reliability risks and their management can be made more visible to the SRC when it is considering security and reliability issues.
- 1.1.4 Based on the aforementioned papers, the SRC agreed that it has a role to review notable power system events, especially where there may be lessons arising from the interaction of multiple industry participants. This is a reactive and backward-looking role, though it was understood that more work was needed to also establish a preventive and forward-looking role with respect to power system reliability. The SRC appeared to be satisfied with the forward-looking reporting it receives on power system security.²
- 1.1.5 The objective of this paper is to set out the concept for a security and reliability RMF and obtain the SRC's views on the potential benefits that may be realised through implementing such an approach. The RMF could be applied as a preventive and forward-looking tool, to assist the SRC in providing meaningful and timely advice to the Authority on reliability of supply issues.
- 1.1.6 This paper is not intended to address the outstanding matter of monitoring of reliability in a way that is representative of the variety of consumer experiences (item #2 on the July 2015 action list).

¹ Past papers are available from <http://www.ea.govt.nz/development/advisory-technical-groups/src/meeting-papers/>

² The National Winter Group report covers short-term capacity security. The system operator's hydro risk curves cover short-term energy security. The system operator's annual assessment of security of supply covers medium- to long-term capacity and energy security.

1.2 Background

- 1.2.1 Significant development of methodologies for identifying and managing risk has occurred during the last fifteen years. This has included the introduction of international standards that provide guidance and set benchmarks for risk management practices. In the electricity supply industry, the use of standards such as ISO 31000:2009 Risk Management and the ISO 55000/1/2 Asset Management suite of standards³ have become widely adopted in New Zealand⁴ and internationally.
- 1.2.2 Risks can be categorised in several ways, such as:
- a) security and reliability of the services to consumers (for example interruptions to supply)
 - b) safety of the public and workers
 - c) environmental
 - d) financial.
- 1.2.3 For the purposes of the proposed RMF, the risks covered by the SRC are assumed to be limited to security and reliability risks.

2 The RMF could help to reduce the likelihood and impact of risks by making industry-wide risk management more transparent

- 2.1.1 This section sets out:
- a) an overview of the RMF
 - b) the direct outcomes of the RMF
 - c) the intended benefits of the RMF.
- 2.2 The RMF is a process that produces an assessment of major security and reliability risks facing the electricity industry**
- 2.2.1 Risk management is an essential activity for organisations; this is particularly the case for essential infrastructure and supply businesses. To achieve good practice risk management many organisations develop frameworks and processes that ensure risks are managed consistently and in compliance with policy. The frameworks also provide for the treatment of risks and required responses to residual risks to be communicated to key stakeholders.
- 2.2.2 The proposition set out in this paper is that a RMF can be used by the SRC to identify risks (sourced either directly from the risk owners or the SRC identifying them) and how the risk owners manage them. The following diagram provides an overview of a framework the SRC could use to provide visibility of risk management and as a basis for providing advice to the Authority. The components of the proposed RMF are discussed in more detail in the following sections of this paper.

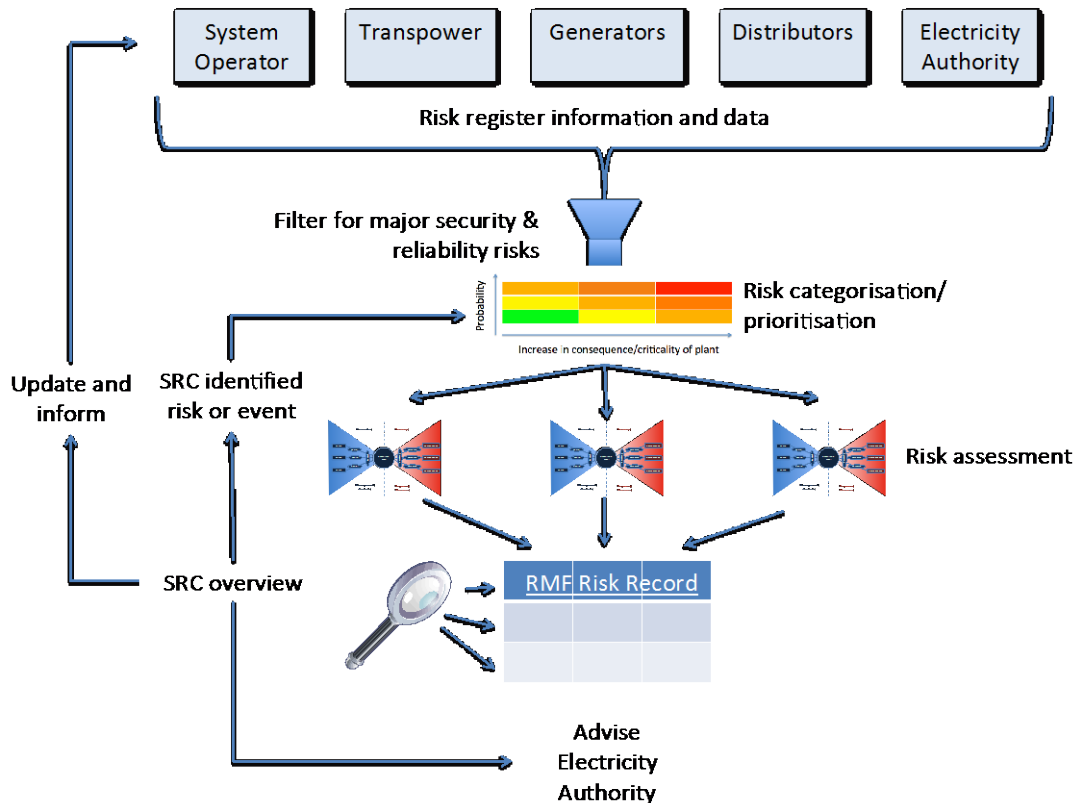
³ ISO 55000 specifies the overview, concepts and terminology in Asset Management.

ISO 55001 defines the requirements for a "management system" for Asset Management.

ISO 55002 provides interpretation and implementation guidance for such a management system.

⁴ For example, Transpower gained ISO 55000 accreditation in 2014.

Figure 1: Overview of the RMF



2.2.3 While compiling information on risks already being managed by industry participants might be seen as a duplication of effort, the SRC will be considering the risks in context of the Authority's statutory objective (rather than in the commercial context of most of the risk owners) and be looking across the industry. This should mean that a broader view of security and reliability issues can be achieved.

2.3 The RMF provides a platform for identifying whether reliability risks are being managed in a transparent and coordinated manner

2.3.1 The SRC has previously asked questions regarding:

- how the electricity industry can better engage with consumers to create appropriate mutual expectations of reliability performance
- the perceptions and reality of the causes of reliability events
- how the Authority and the Commerce Commission roles interact with respect to reliability.

2.3.2 The following questions are also relevant:

- who is the owner of each security and reliability risk (in the sense that which party has the primary responsibility for managing the risk)?
- how is the risk being managed – is this appropriate, and what are the implications of the risk management approach for the Authority's statutory objective?
- how do the roles of risk owners interact with respect to security and reliability?

- 2.3.3 The intention of the development and use of a RMF is to provide a tool through which major risks, and the management of them, can be considered in combination at a high level. The 'ownership' of the risks will not change and neither the SRC nor the Authority will, or be seen to, take ownership of the identified risks.
- 2.3.4 In particular, the RMF concept is intended to address:
- a) questions raised previously by the SRC regarding the range of risks that the SRC is required to consider and provide advice to the Authority on
 - b) the owner of the risk
 - c) how the risk is currently managed
 - d) how any residual risk has been communicated
 - e) how risks may interact or combine in as yet unidentified ways .
- 2.3.5 The RMF can also be used as a repository of information that the Authority can use in its market-monitoring role (e.g. with reference to an efficient level of reliability for the long-term benefit of consumers). Outputs from the RMF can be considered by the SRC before providing advice to the Authority Board (and perhaps be included in event enquiries, the Year In Review or similar publications).
- 2.3.6 In summary, the RMF:
- a) defines supply and reliability risks that:
 - i) fall within the SRC statutory function under the Electricity Industry Act 2010 and the Charter About Advisory Groups
 - ii) are material in terms of probability and consequence
 - b) provides transparency of:
 - i) identified major risks
 - ii) risk treatment (control and response)
 - c) provides a communication platform between risk owners, the SRC and other stakeholders on risks and risk management
 - d) provides information in a consistent format that can, as required, be used to inform and consult with consumers (e.g. for direct formal consultation or to inform more generally)
 - e) provides context and input for the identified risks
 - f) reviews the treatment of identified risks
 - g) identifies any gaps, omissions and potential overlaps of risk ownership
 - h) allows consideration of risk combinations.
- 2.4 The RMF is intended to reduce the likelihood and impact of security and reliability risks**
- 2.4.1 It is expected that the RMF will promote visibility of, and interaction on, major security and reliability risks. Through this, the RMF has the potential to reduce the likelihood and impact of risks that consumers face.

- 2.4.2 This expected benefit cannot be measured because it is generally not possible to identify if an event would have happened if it had not been identified and managed. However, improvements made in the approaches to managing risk are targeted at reducing the potential and consequences of undesirable events.
- 2.4.3 Given the significant costs if a high consequence event occurs and/or is inappropriately managed, the relatively low cost of developing and populating the proposed RMF suggests that the *potential* net benefits of its adoption are high.

3 The RMF assesses major security and reliability risks within a framework that aligns with industry-standard risk management

3.1.1 This section provides information on:

- a) standard practice risk management
- b) the SRC's role with respect to the RMF
- c) key considerations for the design of the RMF
- d) how risks will be identified and recorded
- e) a draft criteria for assessing the probability and criticality of risks
- f) worked example to illustrate the outputs of the RMF.

3.2 The RMF aligns with standard risk management practice

- 3.2.1 ISO 31000:2009 Risk Management – Principles and Guidelines has been adopted broadly in the electricity industry in New Zealand⁵ and Internationally. ISO 31000 provides a systemic and logical process for the management of risks.
- 3.2.2 In New Zealand's electricity industry, examples of the use of ISO 31000 can be seen in network asset management planning where the risk management methods can be combined with modern asset management practices to reduce the incidence and impact of asset failure. Similar approaches are used in the management of electricity generation plant.
- 3.2.3 Alignment with good industry standards of risk management will be an important feature of the RMF. As Transpower (both grid owner and system operator) is an important owner of security and reliability risks, its approach has been taken into account when developing the RMF concept. In its RCP2⁶ proposal submitted to the Commerce Commission, Transpower sets out its approach to risk management as part of its ISO 55000 accredited asset management. Transpower has provided further information on how it is developing its approach to risk management practices. An overview of Transpower's approach is provided in Appendix A.

3.3 The SRC's role would be to assess risk context and treatment, and undertake communication and monitoring

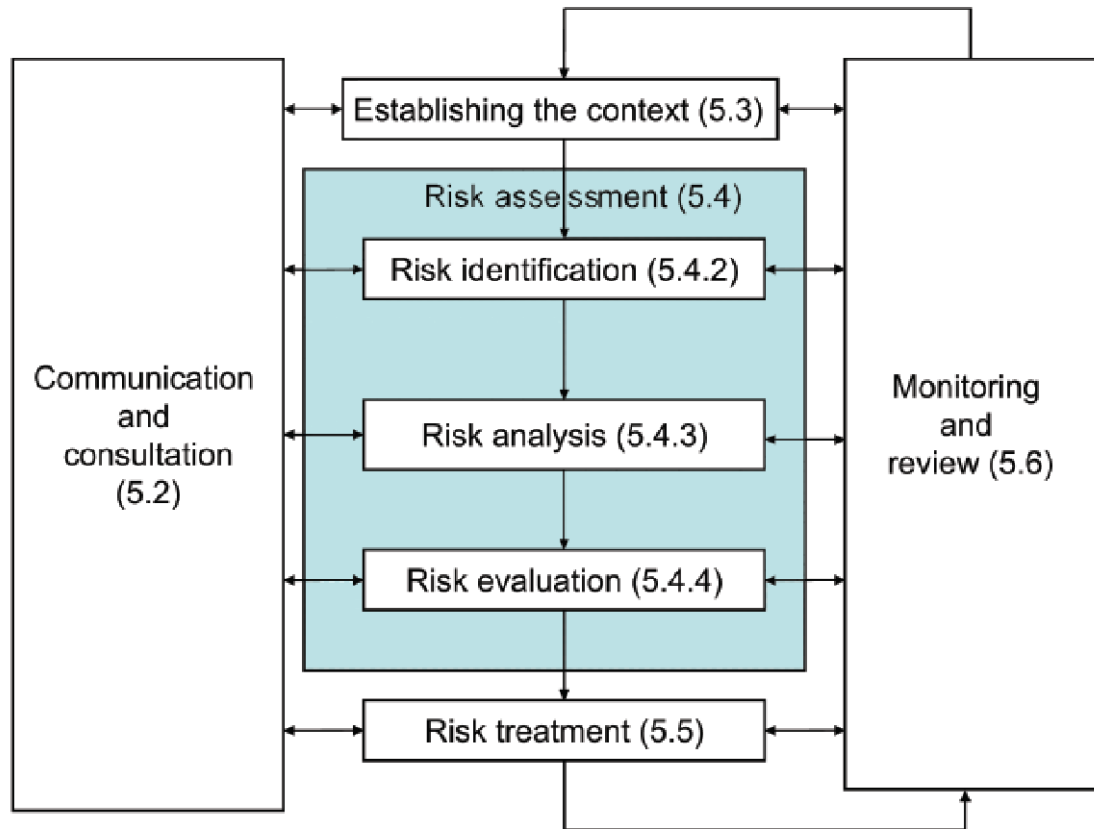
- 3.3.1 The proposed RMF design aligns with ISO 31000 Risk Management and the standard risk matrix approaches found in the electricity industry. The following figure, reproduced from ISO 31000,

⁵ Many NZ electricity industry participants also used ISO 31000's predecessor, Australian and New Zealand standard AS/NZS 4360 that was first published in 1995 and revised in 2004.

⁶ <http://comcom.govt.nz/dmsdocument/11338>

provides guidance on the key risk management process and activities and also a useful perspective on where the SRC has a role.

Figure 2: Risk management process



Source: ISO 31000:2009

- 3.3.2 The guidance provided by ISO 31000 is relevant to the role of the SRC. The activities contained in the shaded 'Risk assessment' area are activities that are undertaken by the owner of the risk (e.g. the party that ultimately is responsible for its management). Establishing context and treating the risk are activities that can be improved through multi party engagement.
- 3.3.3 The SRC may make an important contribution in the unshaded activity areas of the risk management process, particularly in the communication and monitoring areas. How the SRC may do this is summarised in Table 1.

Table 1: SRC engagement in the risk management process

Activity	Potential role for the SRC
Establishing the context	The SRC can review the risk and provide advice to the Authority on the broader context of the risk under consideration. In doing this, the SRC will bring the various perspectives of its members and the knowledge of the potential and consequences of the particular risk, and apply this knowledge and perspective in context of the Authority's statutory objective.
Risk treatment	The SRC will apply the experience and knowledge of its members to how the risk is being treated and identify whether this might be influencing overall security and reliability risk. The SRC can also consider the risk in the context of other risks and the impact on any consequences arising from events associated with the risks.
Communication and consultation	The SRC can take an important role by assisting in the communication and understanding of risks. This includes when providing advice to the Authority and for the Authority's engagement with broader stakeholders.
Monitoring and review	The SRC has a monitoring and review role. Providing alignment and transparency of risk issues, including the existence of residual risks, is a critical component of that role.

3.4 There are many requirements to consider in the design of the RMF

- 3.4.1 While the RMF will be able to be applied to individually identified risks, it could potentially also be used to provide a consolidation of the major security and reliability risks already identified and currently managed in the electricity industry, or part of the industry. In other words, the RMF could draw from existing risk management information to provide a visualisation of consolidated risks. An overview of the RMF is set out in section 2.2.
- 3.4.2 The following are more detailed requirements to be taken into account when developing the RMF:
- whilst broader risks will be considered it is expected that the RMF will prioritise and highlight major risks only
 - the risks included are those that fall within the SRC's purview
 - where it is possible, the framework will be aligned with the standards (e.g. ISO 31000) and the approaches currently used by participants, service providers and other key stakeholders. The objective is to minimise differences between the SRC framework and those commonly used in the industry

- d) the RMF is not intended to replace or duplicate risk management tools and practices used by others
- e) information on the risks (e.g. probability, consequence and management) will be sourced from participants, service providers and other stakeholders risk management systems
- f) the RMF will be capable of undertaking periodic reviews to include additional and changed risks
- g) the RMF will have an output report that provides clear communication of the key components of the management of individual risks and will, to the best possible extent, be based on visual presentation methods
- h) the RMF will produce an output that can be used by the SRC to monitor the industry's management of major security and reliability risks and provide an information source for advice to the Authority.

3.5 The RMF uses two tools to assess risks based on overall priority and controls and responses

- 3.5.1 The following is a matrix approach for establishing a priority order for risks based on the probability of occurrence and consequence of an event. The matrix approach provides for a relatively high level assessment and is widely used in the electricity industry, for example by Transpower.

Figure 3: Risk matrix example



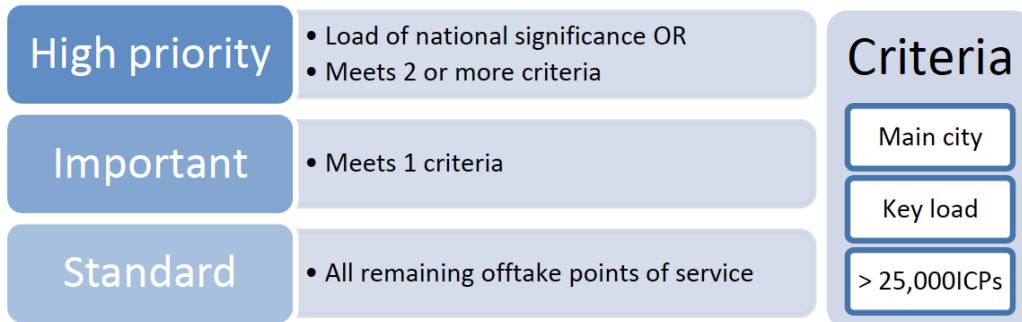
- 3.5.2 When included in the RMF, the matrix will provide a tool for prioritisation of specifically identified risks, or the most common security and reliability risks. The intention is to identify the high and extreme priority risks. Importantly, through the development of criteria for setting the probability and consequence/criticality values of risks, the SRC will define its method for establishing the priority of risks.
- 3.5.3 Scrutiny of the risk owner's assessment of the consequences of identified risks should improve the interchange between the owner of the risk and those that are exposed to the consequences. Improved risk management is likely to result through this interchange.
- 3.5.4 The Security of Supply Risks paper provided to the SRC in February 2014, identified nine security of supply risks being considered for policy development by the Electricity Authority.⁷ An initial

⁷ Available directly from <http://www.ea.govt.nz/dmsdocument/18108>

probability and consequence rating was given for each identified risk. The ratings were 'very low', 'low', 'medium', and 'high'. The criteria on which the ratings were set were not defined and were relatively subjective, based on judgement.

- 3.5.5 Use of standard objective criteria for setting probability and consequence ratings would provide consistency for the assessment of all risks. The criteria used by Transpower to establish priority ratings provide a good example and starting point. Background information on Transpower's assessment process is included as Appendix A.

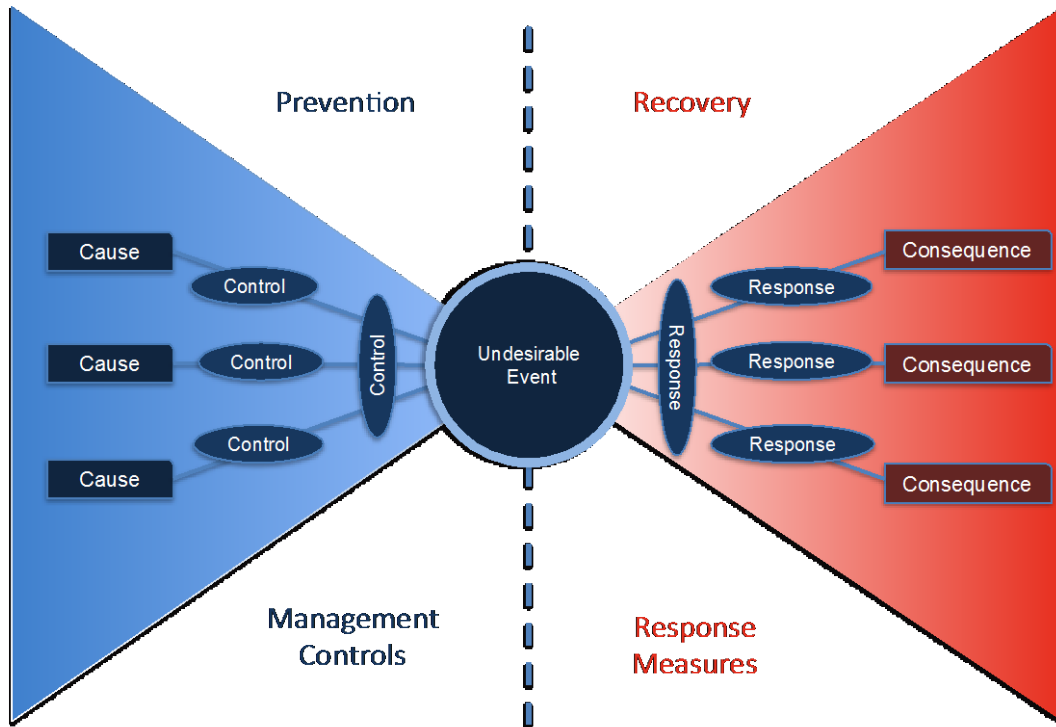
Figure 4: Transpower's criteria



Source: Transpower

- 3.5.6 For the RMF, criteria will need to be established for both the risk potential and consequence axis.
- 3.5.7 For risks assessed as being high consequence (e.g. high impact / low, medium or high probability) it is anticipated that an approach such as the 'bowtie' method will be used to record how the undesirable event is being managed. The Authority understands that the bowtie method is being used in the electricity industry. For example, Transpower is implementing this approach.
- 3.5.8 The following diagram sets out the basic components of the bowtie method.

Figure 5: Bowtie method



- 3.5.9 The bowtie approach lends itself very well to meeting the SRC's requirements as it can be used to document and communicate the industry's management of market, network and service provider risks. It is high level, and contains both proactive (pre-event) and reactive (post-event) management. It also provides a visual single information reference of the management of each risk or undesirable event.
- 3.5.10 The left-hand side of the bowtie provides for scenario based multi-cause events and controls, as is used by the system operator in its annual assessment of security of supply. Similarly, the right-hand side of the bowtie allows for combined and individual post event responses.

3.5.11 An initial example of how the bowtie may be used to present the control and response to risks is provided in the example below. The example is provided for illustration of how the bowtie approach could be used to present the management of risks.

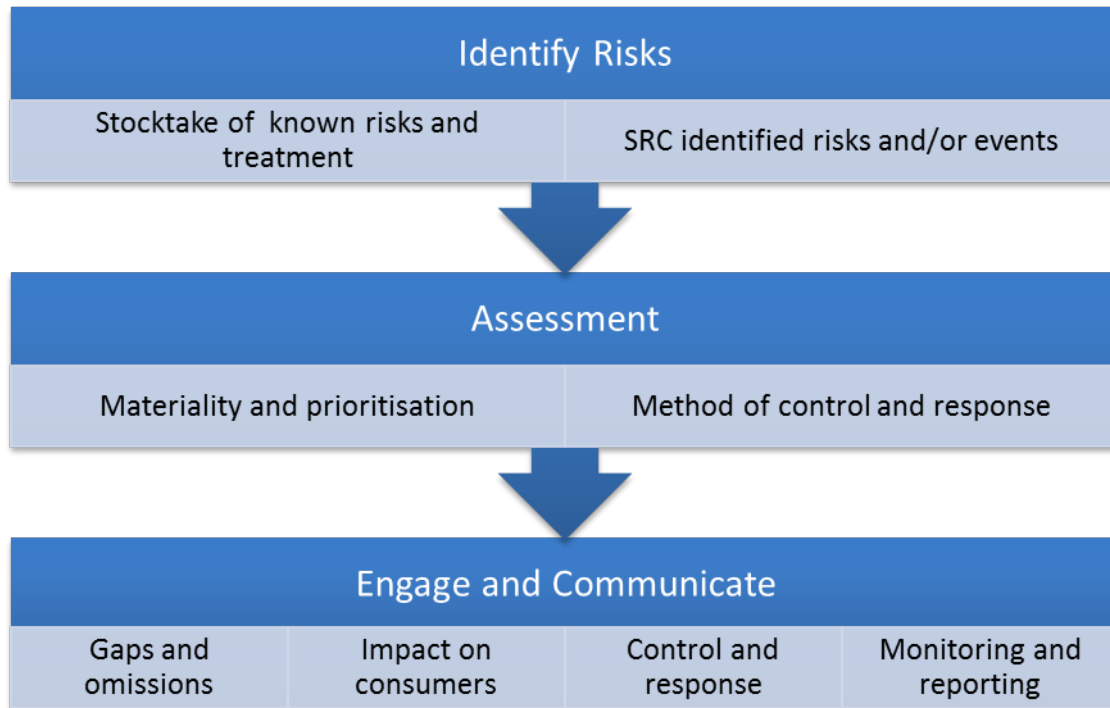
Table 2: Worked example – Low Hydro/high demand/constrained HVDC/loss of NI generation event

Cause/Scenario	Individual control	Group control		Group response	Individual response	Consequence
Sustained low hydro inflows	Monitor	Monitor security margins and market performance/responses	Undesirable Event	Monitoring and communication	Customer compensation schemes introduced	Loss of supply to >XXXXX ICPs
High demand due to long period of cold weather	Monitor	Communicate and inform market		Official conservation campaign	Proactive management of vulnerable and medically dependent consumers	Economic loss estimate VoLL x MWh undelivered to consumers
Constrained HVDC northwards transfer	Monitor	Hydro risk curve framework		Rolling outages	Outage coordination with network businesses	Reputation damage to market/industry
Unavailability of major NI thermal plant	Monitor			Participant rolling outage plans	Safety information for consumers	Cost to retailers of conservation campaigns
Overstated ability of power system during low hydro draw down	Improved modelling					

3.5.12 When considering this example, the SRC may note and decide to monitor progress of actions to improve understanding of this risk and particularity. If there is a possibility that this risk, when combined with others, has the potential to amplify the consequences, the SRC may seek further analysis from the risk owner. The SRC could also note that if the undesirable event occurred, the planned responses appeared to be appropriate.

- 3.5.13 The approach proposed in this paper combines a risk prioritisation matrix and bowtie method to provide a method through which the SRC can monitor major security and reliability risks. The tool would also provide information that would promote improved visibility of and interaction on the management of the risks and its potential consequences.
- 3.5.14 The process through which the RMF would be populated is provided in figure 6.

Figure 6: RMF process



- 3.5.15 Following the development of criteria used to define and prioritise identified risks, a stocktake could be undertaken to identify the currently known risks (for the industry overall, or just a specific component) and establish the current treatment (controls and responses) that is currently applied to the risks. This information will be collected in the bowtie register.
- 3.5.16 It is expected that the information will be sourced mainly from the system operator, grid owner and distributors supplying major regions, large loads and central business districts. Much of this information will be available from published documents and through requests directly to the relevant businesses. Generators with large portfolios and with reliance on common primary energy sources (e.g. hydro and gas) will be asked to provide any additional information as needed for the assessment of multi-cause risks.
- 3.5.17 It is important for the SRC to note the voluntary nature of the provision of risk data and information from risk owners. It would be valuable if the SRC would endorse and encourage industry cooperation to act reasonably and responsibly to assist the development of the RMF.
- 3.5.18 As there will be commercially sensitive information in risk owners' risk registers, careful handling of this information will be required. For example, this may include making it clear that risk owners will be able to filter out or redact information that they consider to be irrelevant and/or sensitive. The risks in the RMF may need to be presented at a generic level (for example 'North Island

generator failure'). This would mean that risk controls and responses would also need to refer generically to preventive steps and treatments.

- 3.5.19 The SRC will assess the outcomes of the RMF and consider the priority of risks and the current control and response management applied to them. The RMF could also be used to seek the views of stakeholders on the contents and also identify any risks that have been omitted or under/over stated. The SRC can advise the Authority on the outcomes and provide recommendations for improving the management of risks.
- 3.5.20 If the proposed approach is accepted by the SRC, the RMF concept will be developed into a demonstration model.

4 If the SRC approve of the concept of the RMF, there could be up to three further stages of development

4.1.1 This section provides information on the:

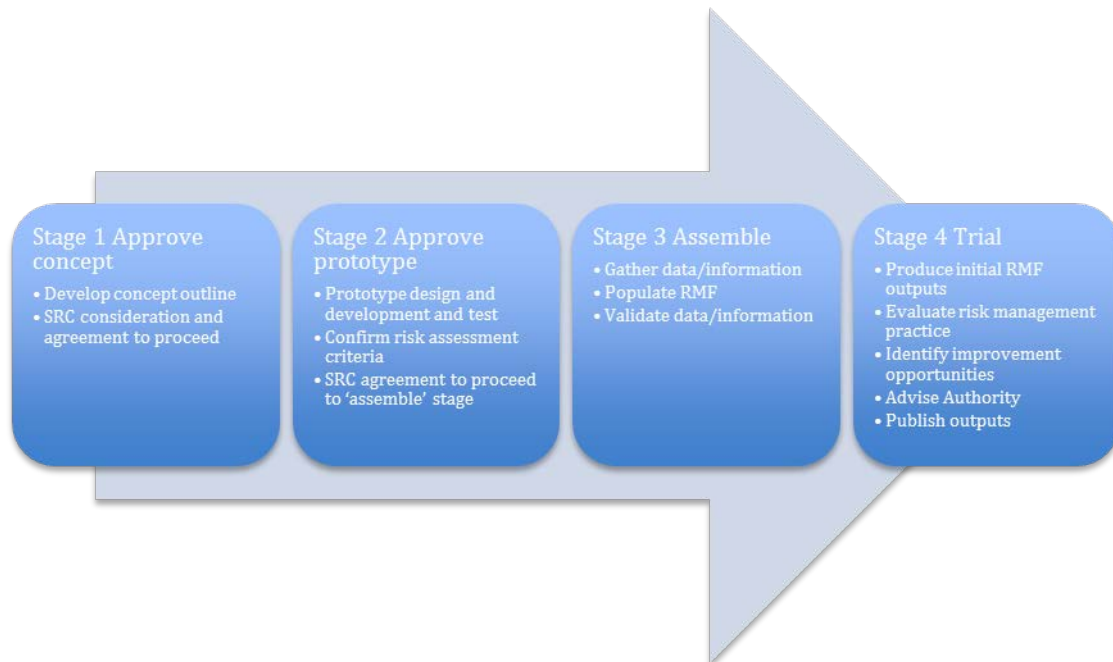
- a) proposed development stages for the RMF
- b) process for maintaining the RMF
- c) termination of the RMF.

4.2 There are four potential development stages: Approve concept, approve prototype, assemble, trial

4.2.1 The RMF development has four stages: Approve concept, approve prototype, assemble, trial. This paper proposes the concept for approval. If the SRC endorses further development, they should request that the Authority proceed to investigate the cost and effort associated with developing the prototype.⁸ Any further development would then be subject to the outcome of the prototype.

⁸ The SRC's Terms of Reference state that "The Authority is responsible for ensuring that the SRC is resourced appropriately to perform its function...The SRC does not have the authority to commission analysis or to commit resources and expenditure." The Authority has not made provision for completing this RMF in its 2015-16 work programme, as the concept was developed after the work programme was completed. If the SRC wishes to pursue this initiative, the Authority can look at how it can adjust its activities to enable the next stage of the project to be completed.

Figure 7: The four development stages of the RMF



Stage 1: Approve concept

- 4.2.2 This paper sets out the concept design for the RMF for the SRC's consideration.

Stage 2: Approve prototype

- 4.2.3 If the SRC supports further development, a prototype RMF will be designed and developed. This will be tested with key risk owners (e.g. system operator, larger generators) and the relevant Authority staff.

- 4.2.4 If the development proceeds to this stage, the SRC will be asked to approve:

- a) criteria for assessing the probability and consequence/criticality of risks. The criteria will be used to categorise and prioritise the identified risks in the prototype RMF
- b) indicative formats for RMF outputs
- c) protocols for handling of information from participants' risk registers.

- 4.2.5 Following the completion of this stage, the SRC will be asked to endorse the assembly and information gathering for the RMF.

Stage 3: Assemble

The sourcing and gathering of information and data on key security and reliability risks will be a key component of this stage. Given the apparent maturity level of risk management in the electricity industry it is expected that the information for high and extreme risks will be held in risk owners' risk registers. As discussed in paragraph 3.5.18, the SRC secretariat expects that sensitivity issues may need to be resolved for some information before risk owners agree to its release and use in the RMF.

- 4.2.6 Information can be gathered from all stakeholders at one time or sequentially commencing with the main players e.g. Transpower (grid owner and system operator), city distribution businesses and the largest generator/retailers.
- 4.2.7 Alternatively, a more discrete set of risks, or certain specific risks identified by the SRC could be investigated.
- 4.2.8 Once population has commenced, it is expected that calibration will be required to ensure that all risks included are considered on the same basis. This involves rating them on a single common matrix and could require a workshop of key stakeholders to provide validation.

Stage 4: Trial

- 4.2.9 When initial population has been completed, the RMF can be used to provide information to the SRC on high and extreme risks and how they are currently being managed (proactively and reactively). The RMF can be used by the SRC to gain a view on areas where improvement opportunities exist and to communicate to the Authority the SRC's views on the appropriateness of the current level of control and response for the major risks. It is also possible that gaps in risk identification and/or treatment may be identified.
- 4.2.10 It is expected that the bowtie approach will allow the RMF outputs to be communicated to stakeholders and, if appropriate, published on the Authority's website.

4.3 The SRC could regularly consider revisions to the RMF

- 4.3.1 The secretariat expects it will be a relatively simple, low resource task to update the RMF register. This expectation will be tested during stage three of the RMF development.
- 4.3.2 The SRC could then be asked to consider revisions to the RMF:
 - a) regularly (perhaps annually or biennially), in relation to the entire RMF or the risks that have been populated into the RMF to-date
 - b) on exception, in relation to any change that meets a threshold of materiality (to be agreed).
- 4.3.3 The materiality threshold would consider whether a change:
 - a) increases the risk priority of an existing risk
 - b) creates a new risk
 - c) has been made to the controls or responses, but not the risk priority.

4.4 The RMF would require SRC approval to continue beyond a short term trial

- 4.4.1 Following an initial period of operation⁹ the RMF would be reviewed and, if its continuing use is not supported by the SRC, it would be terminated.
- 4.4.2 Notwithstanding the above, the RMF could be terminated at any time if the SRC considered that this was appropriate.
- 4.4.3 As explained in paragraphs 4.2.1, the resourcing for the development and maintenance of the RMF is subject to Authority approval. Therefore, withdrawal of any such approval by the Authority would also trigger termination of the RMF.

⁹ This might be a period of, say, a couple of years in order for it to be effectively trialled and tested.

5 The SRC is being asked to agree whether to request the Authority to investigate developing an RMF prototype

5.1.1 The SRC is asked to consider and provide advice on the following questions:

- | | |
|------------|--|
| Q1. | Is the proposed RMF tool likely to be useful for the SRC when considering security and reliability risks? |
| Q2. | Is the RMF likely to be useful for communicating risks and risk management to the Authority and broader stakeholders? |
| Q3. | Does the SRC consider that the RMF will improve the management of risks and, through this, reduce the probability and consequences of undesirable security and reliability events? |
| Q4. | Does the SRC endorse the concept of the RMF and would it like to request the Authority to investigate developing it to the prototype stage? |
| Q5. | Will the SRC encourage industry participation in the RMF, particularly the provision of risk-related information? |
| Q6. | What advice, if any, does the SRC wish to provide to the Authority? |

Appendix A Overview of Transpower's approach to risk management

A.1.1 The following are extracts from Transpower's Asset Risk Management - Criticality Framework that was submitted to the Commerce Commission as part of its RCP2 proposal. The figures below are self-explanatory and demonstrate how Transpower has applied its criteria to establish a criticality rating for a selection of transmission system components.

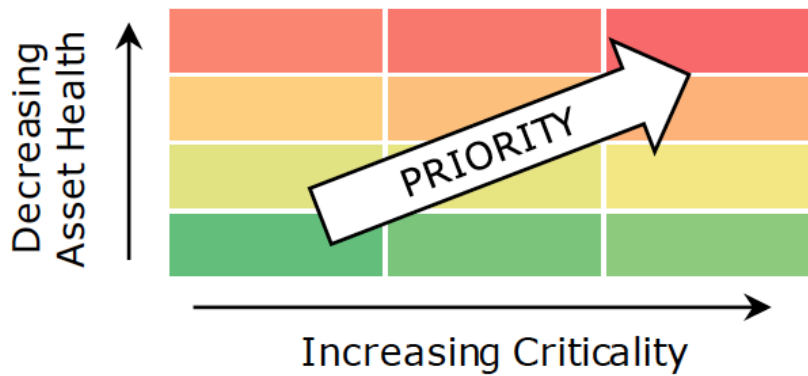


Figure 1: Asset Risk Proxy: Asset Health and Criticality

High priority	• Load of national significance OR • Meets 2 or more criteria	Criteria Main city Key load > 25,000ICPs
Important	• Meets 1 criteria	
Standard	• All remaining offtake points of service	

Description	Load of national significance	Large City	Key load	>25,000ICPs	Criticality
Addington 66 kV		Christchurch	CBD	Yes	High Priority
Bream Bay	Refinery		Refinery		High Priority
Invercargill			Dairy	Yes	High Priority
Cambridge			Dairy		Important
Kaiwharawhara		Wellington			Important
Kawerau (A)			Pulp and Paper		Important
Rotorua 33 kV					Standard

Consequence of an outage	Effects	Criticality
Places more than one of the following on single circuit security	Includes High priority POS	High
	Standard or Important POS	Medium
Places one of the following on single circuit security	>200 MW of load	High
	High priority POS	High
	Important POS	Low
	Standard POS	Low
Causes a loss of supply at one of the following	>200 MW of load	High
	High priority POS	High
	Important POS	Medium
	Standard POS	Medium
No effect		Low

Busbar or circuit criticality assignment rules

Source: Transpower BR03 Asset Risk Management - Criticality Framework

References

The system operator's annual assessment of security of supply 28 May 2014

BR03 Asset Risk Management criticality framework – Transpower 15 November 2013

ISO 31000:2009 Risk Management Principles and Guidelines

ISO 55000 specifies the overview, concepts and terminology in Asset Management

ISO 55001 defines the requirements for a "management system" for Asset Management

ISO 55002 provides interpretation and implementation guidance for such a management system

Glossary of abbreviations and terms

Act	Electricity Industry Act 2010
NI	North Island
ISO	International Organisation for Standardisation
RCP2	Regulatory Control Period 2 – Commerce Commission review to set Transpower's allowable revenue.
RMF	Risk Management Framework
SRC	Security and Reliability Council