Meeting Date: 16 August 2023

RISK RADAR – SECURITY AND RELIABILITY RISKS

SECURITY AND RELIABILITY COUNCIL

This paper is to help the SRC brainstorm about electricity industry risks with the objective of ensuring that they spend their time dealing with the most consequential matters that could manifest over a mix of timeframes.

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.

Risk Radar - security and reliability risks

1. Purpose and background

1.1. This paper presents the latest version of the SRC's risk radar (Table 1). The risk radar supports the SRC to triage their time and attention in a risk-based way.

1.2. Risks are sorted into four categories:

a) risks that could manifest within one year.

b) risks that could manifest within five years.

c) risks that could manifest in more than five years.

d) persistent risks that could manifest at any time.

1.3. Within each category, risks are ordered by the SRC secretariat's rough estimation of consequence and likelihood.

2. Changes since the previous version

2.1 There were no changes arising from the SRC's June meeting.

2.2 The radar will be reviewed at the strategy session, informed by an updated environment scan and input from members.

2.3 Additions to the register are marked in red and removals with ~~strikethrough~~, although, as noted, there were none for this meeting.

3. Questions for the SRC to consider

3.1 The SRC may wish to consider the following questions.

Q1. What content changes would the SRC like made to this risk register for the next meeting?

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?

Table 1: Risk radar - security and reliability risks

This table sets out the risks, as discussed at each meeting. The risks are not listed in priority/rank order

Short term Within 1 year	**Medium term** Within 5 years	**Long term** More than 5 years	**Persistent** Could arise at any time
S1: the risk of a growing disconnect between energy and capacity issues due to more intermittent renewables (without adequate firming) causing more regular industry disruption and could result in unplanned outages (e.g.,9 August 2021).	M1: Inefficient market response to significant industrial demand reductions (eg Tiwai exit).		P1: Cyber-attack damages power system assets and/or cuts supply, for example Waikato DHB and Colonial Pipeline (both 2021), or breaches data security - Pinnacle Midlands Health Network (2022)
S2: The prospect of Dry winter / official conservation campaign increasing prices and carbon emissions through increased thermal generation and as the risk becomes realised there is likely to be supply reductions both voluntary and mandatory.	M2: Continued delay to the Review of 'Tree Regs' increases risk of damage and blackouts due to tree interference with lines.	L1: Ageing and/or under-invested generation, distribution. and transmission assets lead to increased failures.	P2: Gas supply running down (in part due to exploration uncertainty) reduces generation adequacy and availability.
S3: Market confidence reduced by the pain from high prices and security of supply (dry year) causing regulatory intervention impacting on investor's willingness to invest long-term in assets for de-carbonisation.	M3: Aspirational Government carbon goals leading to early thermal exit potentially causing reduced reliability and security of supply, if capability and ambition are misaligned.	L2: The increasing dependence on artificial intelligence (AI) and automation reduces the industry's ability to deal with unusual and unexpected critical issues (in real time or to quickly recover)	P3: Physical attack (war, terrorism, sabotage, and political unrest/protest) damages power system assets and/or cuts supply.

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S4: Black out risk rises if the transition from the current two-block to a four-block extended reserve scheme is delayed/poorly implemented.	M4: Lack of thermal generation (Huntly, Taranaki - both existence and availability) for its firming role adversely affecting reliability and security.	L3: Undersized generation fleet due to demand growth from greater electrification (without adequate demand response) exceeds generation capacity causing unplanned outages.	P4: Natural disaster damages power system assets and/or cuts supply.
S5: Reduced output from hydro due to changes in generation output arising from the National Policy Statement on freshwater management.	M5: Poor standards governance and enforcement permits inadequate standards and/or significant non-compliance of equipment against standards.		P5: National or international pandemic harms access to: a) the availability of imported goods/services b) international specialists and reduces ability for work crews to travel domestically.
S6: Reduction in investment confidence due to uncertainty about how Electricity Price Review conclusions and other Government policy interventions (eg Onslow pumped hydro) will be implemented.	M6: Increased peak demand on some LV networks from electric vehicles causes localised supply outages and potential network damage and unnecessary network investment.	L4: Loss of industry knowledge and capability through an aging workforce and younger people moving overseas.	P6: Insufficient information sharing and planning amongst industry participants in relation to reliability of supply risks increases costs and reduces reliability.
S7: Unsignalled or quickly changing strategic priorities of the regulator increases investment uncertainty for industry participants.	M7: Commerce Commission's regulatory control period #3 (April 2020-March 2025) impacts on reliability and asset health by inhibiting investment.	L5: Reliability treated less like a public good as new technology makes it more customisable and left to individual response, which causes an unstable system if	P7: Changes in industry live line and supply restoration operating guidelines, for example continued reluctance to use live line techniques for suitable work, lead to reduced supply

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		individuals don't take up DER.	reliability performance through increased planned outages.
S8: Unreliable social media commentary impacting on assets or personnel in the industry (e.g. critical comments inciting physical attacks on repair personnel, equipment or thermal fuel deliveries).	M8: Generation market structure not aligning with or reacting to physical structural change, reducing investment incentives, e.g. pumped hydro, thermal decommissioning, and the transition to 100% renewables	L6: the risk of stranded assets increasing the cost for those left using them (the "death spiral") becoming increasingly apparent making networks commercially unviable.	P8: AUFLS is not set per the current Code requirements potentially causing blackouts if AUFLS does not arrest frequency drop.
S9: Ongoing fallout from COVID-19 and the Russian annexation of Ukraine harms industry's: a) personnel capability/travel. b) availability and increased prices of imported goods/services. general level of preparedness and responsiveness for managing incidents, and the potential impact on critical industry plant such as generating stations and control rooms; and the ability to get enough critical expertise into the country with the aggregate impacts of supply chain issues,	M9: Impact of increased climate and weather-related events causes an increase in severity and frequency of network and transmission outages.		P9: LV network congestion, due to rapid increase in small scale distributed generation, increasing likelihood of network damage and unplanned outages.

Short term Within 1 year	**Medium term** Within 5 years	**Long term** More than 5 years	**Persistent** Could arise at any time
a growing economy and big investments.			
S10: Risk of lack of preparedness for the ongoing fallout from COVID-19 and the Russian annexation of Ukraine causing further economic hardship (with consequent impact on potential reduction in maintenance).	M10: Simultaneous replacement across multiple networks of ageing assets causing resource and supply chain issues, reducing security and reliability of supply.		P10: Unplanned gas supply interruption may limit gas fired thermals' ability to generate.
S11: Diffuse or fragmented responsibilities across government entities makes it harder to get alignment, leading to inefficiencies or delays in strategies and critical system security workstreams.	M11: Generator investor incentives weakened due to uncertainty, for example, arising from Tiwai closure and central government investigation into solutions to dry-year risk such as pumped hydro storage.		