14 October 2022

Entrust
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Attention: The Trustees

Network Security Report 2022

The Auckland Electricity Consumers Trust (AECT) deed requires that Vector management engage an independent expert to provide a report that advises on the state of the Auckland Electricity reticulation assets. Vector's majority owner Entrust has requested that this study include all of Vector's electricity distribution assets.

WSP was engaged by Vector to undertake the 2022 review. WSP is one of the world's leading professional services firms, providing engineering, design and strategic advisory services to clients across all industries. WSP is well regarded for our capability to apply our technical subject matter knowledge, combined with strong commercial acumen and regulatory understanding, to ensure that asset management strategies and processes are robust and well supported both technically and economically.

WSP's review team consisted of experienced Chartered Professional Engineers and Certified Asset Management Assessors. The team has strong experience in undertaking similar investigations and reviews across Australia and New Zealand.

SCOPE OF WORKS

The study focused on the effectiveness of Vector's processes that support Operational Risk Management for its electricity network. Five specific areas were specified for the review including maintenance practices, network growth, capacity to meet forecast demand, risks to security of the network, Vector's response to managing customer behaviour and the uptake of distributed energy resources. To support the desktop review, limited site visits were carried out to assess how well the field service providers are complying with the maintenance and data recording practices specified by Vector.

CONTEXT

Since the previous Network Security Report was published, a number of factors have influenced Vector's network and the processes applied to manage operational risk. The biggest impact has been from the advent of the COVID19 pandemic and its impacts on network demand and Vector's ability to carry out normal network activities.

FINDINGS AND RECOMMENDATIONS

WSP found that Vector has developed and implemented appropriate approaches to managing the operational risk of its network. There could be improvements made, but in general the processes were well-defined, consistent with peer electricity businesses, and evidence was sighted to demonstrate that processes were being suitably followed.

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The following paragraphs provide an overview of our findings in each of the areas.

a/ Maintenance

Vector operates a rolling 10-year maintenance programme that consists of preventative, corrective and reactive maintenance. The corrective maintenance strategy applies risk-based prioritisation to schedule defect remediation activities. Other planned work is completed concurrently so that multiple defects can be addressed during a single outage, thereby reducing network interruptions.

Vector has made a concerted effort to improve its maintenance programmes by fully integrating SAP PM across all its maintenance programmes, thereby enabling data-based decision making. WSP also found that the contractual arrangements established for the field service providers have been effective in improving network performance.

WSP considers that the approach to maintenance in line with industry practices, and that the budgeting for these maintenance activities is appropriate.

b/ Upgrades and investment

Vector has implemented a sound governance process to manage capital investment. The process is incorporated in the SAP workflow system, which provides traceability and is consistent with gateway processes and approval practices at peer electricity businesses. Capital Expenditure Justification (CEJ) documents are the artefacts developed to demonstrate prudency and efficiency of expenditure.

WSP found that there may be an opportunity to further improve the process by ensuring CEJs are developed as early as possible, with the objective of maximising the number of full CEJs completed for projects planned for execution during the early years of the AMP planning horizon, thereby increasing the confidence in the investment required in the near-term capital expenditure plan.

WSP considers that Vector has implemented an appropriate investment decision-making process that includes consideration of network risk when prioritising projects, and that the investments identified appear appropriate for the current state of the network.

c/ Capacity and planning

Vector has a sound approach to modelling its 30-year demand forecast and identifying constraints at zone substations. The approach uses three separate models, which were found to be functioning correctly and producing appropriate outputs. Security of Supply Standards were correctly applied in the models.

Vector has applied scenario modelling to gain a clearer understanding of future electricity demand. The modelling explores different scenarios that are based on plausible trends in the uptake of technology to 2050. The scenario considered most likely (termed Symphony) has been adopted as the base case in planning. WSP found that this was a sound process.

Vector has demonstrated that it is applies a defined process for accepting new asset types and technologies onto the network and is advanced in its transition to a modern customer-centric business model. Customer experience key performance indicators are monitored and used to plan and implement customer experience improvement initiatives.

d/ Security and risk

WSP found that Vector has well-defined and embedded processes for security and risk management in order to achieve its business objectives. The risk processes and Security of Supply Standards are consistent with peer electricity businesses, enable identification of network constraints and risks, and are resulting in appropriate investment on the network.

A recent improvement has been the establishment of a Business Continuity and Resilience Framework which consolidates all related documentation into one location and provides improved governance. The business continuity framework includes a crisis management plan, business unit continuity plans, facility contingency plans and emergency response plans.

WSP found that Vector's cyber security capability is advanced compared to its peer businesses, as demonstrated by the ability of the Vector Technology Solutions business unit to provide cyber security services to other EDBs. We found that Vector has demonstrated well-defined and embedded processes for cyber security, and has demonstrated effectiveness at identifying and mitigating cyber risks.

WSP considers that the processes applied to capacity and security are aligned with peer electricity businesses, enable identification and mitigation of risk, and are resulting in appropriate investment on the network.

e/ Future networks

Vector has recognised that Distributed Energy Resources (DERs), predominately electric vehicles, and the decarbonisation of the economy, will drive long-term increases in demand; and that advanced planning can result in significant savings for customers. In response, Vector has developed a roadmap that defines its approach to the management of DERs and non-network solutions.

The roadmap demonstrates a strong focus on developing the network and the functionality of systems for the management of DERs; and non-network solutions to enable deferral, or avoidance, of network investment. While the roadmap was still in draft at the time of this review, it demonstrated a coordinated approach across the business for setting up the appropriate systems and processes as a foundation that can be scaled up as required.

Vector has demonstrated it will consider the benefits of non-network solutions when undertaking network planning at both a strategic and tactical level. The method for assessing the economic value of non-network solutions is new and not yet widely implemented, but is planned for implementation in the RY23 AMP.

WSP considers that Vector has established a robust draft roadmap for its future networks workstream, with a strong link to planning and a new modelling tool to assess the economic viability of non-network solutions.

f/ Field reviews

WSP observed preventative and corrective maintenance activities being undertaken in both the Northern and Auckland regions in both zone substations and on the distribution network. These are detailed in Appendix B. A high level of safety and quality of workmanship was demonstrated and the FSPs were observed to be following the Vector standards.

CLOSING STATEMENT

In WSP's opinion, the documentation provided, discussions held with key staff and management, and audits of network operations undertaken by field crews, demonstrate that the process, strategies and initiatives currently being implemented by Vector are generally appropriate to manage the operational risk of the network.

WSP has made a number of recommendations that will assist Vector with its continual improvement activities and ensure ongoing operational risk management.

Regards,

Rebecca Tjaberings
Director Power