Network Security Report 2024

30/08/2024

Entrust
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Attention: The Trustees

Entrust, as Vector's majority shareholder requires under the NDREOR that Vector management engage an independent expert to provide a report that advises on the state of the Auckland Electricity reticulation assets.

WSP was engaged by Vector to undertake the 2024 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

The study focussed on the effectiveness of Vector's approach and processes that support the management of network assets. The following areas were reviewed: Maintenance, Upgrade and Investment, Capacity and Planning,

Security and Risk, Managing network resilience in response to the impact of climate change and Managing the uptake of EV's. 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 2022 report, Vector's network has been impacted from several climate change related events such as the Auckland Anniversary Floods and Cyclone Gabrielle. In addition, the trends around EV uptake, DER integration and large point loads such as data centres continue to evolve. These issues pose a challenge for network reliability and efficient capital investment. It should also be noted that a variety of government policies and incentives will continue to impact Vector's path forward, and these are highlighted in the summary below.

FINDINGS AND RECOMMENDATIONS

WSP found that Vector has developed and implemented appropriate approaches to managing its network assets. In general processes were welldefined, expenditure appropriately allocated, consistent with peer electricity businesses, and evidence was sighted to demonstrate that processes were being suitably followed. While some areas for improvement were identified, these were low risk.

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

A. Maintenance

WSP found that Vector's approach to forecasting maintenance, asset replacement and associated expenditure is appropriate and consistent with good industry practice. Vector's procedures and standards that have been established for high criticality and high-volume assets are generally in line with industry practices and equipment manufacturer requirements and have evidence of ongoing review and updates with expenditure appropriately allocated.

WSP also found that Vector is performing in line with good industry practice in relation to planning and executing maintenance activities.

Vegetation management is critical for the safe and reliable operation of the network. The Electricity (Hazards from Trees) Regulations 2003 have been under extended review since 2019 with some potential changes only made public this year. Vector's vegetation strategy should be updated following the completion of the Tree Regulation review.

We note that Vector's strategic objective following an internal review of planned maintenance, to undertake risk assessment on a common basis

across asset classes will enable improved decision making and trade-offs across asset classes between replacement, maintenance and augmentation investment options and therefore help improve management of overall network risk and performance.

We found that there is evidence of performance improvement in the raw data and that Vector has been compliant with performance standards during DPP3, except for 2023 due to impacts of Cyclone Gabrielle and the Auckland Anniversary Floods. Vector is actively monitoring and taking actions to manage performance in areas that are likely to have material benefits. WSP considers that the initiatives and reliability practices are appropriate for maintaining network reliability performance within the compliance limits.

B. Upgrades and Investment

Vector has well-defined and embedded processes for identifying network upgrade needs and capital justification to achieve its business objectives and reduce investment risk. These processes are being managed and are performing similarly to peer organisations.

WSP recognises Vector's ongoing efforts and commitment to improve their practices and considers that Vector has developed and implemented an appropriate investment decision-making process, such that the resulting expenditure appears appropriate for the current state of the network.

C. Capacity and Planning

WSP found that Vector has well-defined and embedded processes for future planning that utilises granular data to provide a robust bottom-up model that is used to assess future scenarios, determine the demand forecast and identify potential network constraints. Innovative Assets Engineering (IAEngg) was engaged by the Commerce Commission in July 2023 to undertake a review of the 2023 AMPs of the NZ Electricity Distribution Businesses (EDBs) and concluded that Vector had an 'excellent' load forecast system for network growth in comparison to its NZ peers. WSP have noted the comparative strength of Vector's forecast model in their review and concur with this assessment.

WSP reviewed and recognises the improvement in the documentation of the Customer Scenario model and the approach to continual improvement of the models and input assumptions.

D. Security and Risk

Vector has well-defined and embedded processes for security and risk management. Vector have improved the approach applied to quantify resilience. As a result, they have a better understanding of the current state of network resilience and the benefits that can be achieved by different projects and project options. WSP also found that Vector has also

demonstrated well-defined and embedded processes for cyber security and has demonstrated effectiveness at identifying and mitigating cyber risks.

The processes reviewed are consistent with good industry practice, enable identification of network constraints and risks, and are resulting in appropriate investment on the network.

E. Managing Resilience and Impacts of Climate Change

WSP found that Vector has integrated the impact of climate change on network resilience and security of supply into its processes and is actively managing the associated risks and opportunities. We found that Vector is undertaking appropriate steps to obtain robust data from appropriate sources which ensures that it is suitable for the context of their network region. They are then using the data to identify and assess risks and determine appropriate mitigation options, both in relation to network investment and network operational practices.

The impact of vegetation on the network, particularly during storms and other major events, affects network reliance. Vector recognises that the outcome of the Electricity (Hazards from Trees) Regulations 2003 review will have a material impact on how vegetation can be managed and alternative options that should be considered to manage network resilience. WSP believe that this is a prudent approach that will potentially result in a more affordable outcome for customers if Vector's recommendations are adopted.

F. Managing the Uptake of EV's

Vector has established robust processes for dealing with the uncertainty of EV uptake and customer charging behaviour as well as the resultant variability in EV demand. This includes developing a future network roadmap and embedding the forecast uptake of EVs (as per the customer scenario model) into the network constraint modelling.

This approach allows Vector to incorporate EVs and provide potential for orchestrating charging that promotes affordability and provides efficiency benefits to the total network demand forecast. However, Vector recognises that their ability to manage the update of EVs and to achieve the Symphony Scenario is dependent on the setting of good government policy and regulations that promote these efficient outcomes. WSP believe that Vector's prudent approach to the changing and uncertain EV demand will potentially result in an affordable transition for customers.

Vector have identified that safeguarding regulatory settings is a strategic objective across asset classes which, when combined with good national policy will be essential for the electrification of transport.

WSP found that Vector has robust technology platforms with ADMS and DERMS to enable collection and analysis of data and control of EV charging.

In addition, Vector has demonstrated they are actively consulting and working with customers and stakeholders to understand their changing needs. This will help in assessing innovative new technologies that may provide a net benefit to the business.

G. Field Review

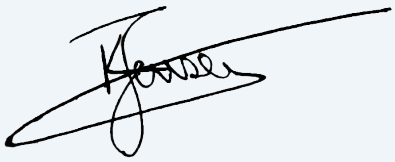
WSP observed preventative and corrective maintenance activities being undertaken in both the Northern and Auckland regions in both zone substations and on the distribution network. Overall, we observed a high level of quality of workmanship and that the FSPs were observed to be following the Vector standards. We found strong engagement and compliance with health and safety procedure and requirements.

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 appropriate to manage the operational risk of the network.

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

Regards



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