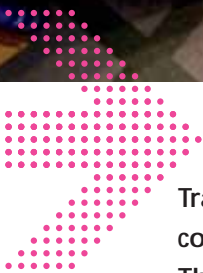Alcatel·Lucent

TRANSPOWER NEW ZEALAND

PROVIDING MODERN COMMUNICATIONS
FOR NEW ZEALAND'S NATIONAL ELECTRICITY GRID

Transpower New Zealand, the national electricity transmission grid operator, needs a reliable communications network to ensure optimum management of its modern power system. The company has called on Alcatel-Lucent to renew its telecommunications network.

Transpower's Perspective

CHALLENGES

In New Zealand, power systems are being run harder than ever before. This is due both to the difficulty of building new assets (for environmental reasons), and the impact of emerging renewable energies such as wind. To ensure optimum management of the existing power system and safely handle increased demand as new systems come on line, a reliable communications network is essential. In this regard, Transpower, the transmission owner and operator in New Zealand, needs to:

> **Replace aging networks:** Transpower's communications networks – like its power networks – need renewal, to resolve reliability and capacity issues. If not overhauled, the legacy communications network could put the electricity supply at risk.

> **Reduce costs:** Under increasing pressure from stakeholders, Transpower must transmit electricity more cost effectively. For this, it needs a modern communications network that will lower operational costs, while offering improved flexibility and operational efficiency.

SOLUTION

To transform its communications network, Transpower selected as its trusted partner Alcatel-Lucent, because of the company's depth of engineering, product and operational expertise, multi-vendor capabilities, and experience in working with utilities. Alcatel-Lucent's solution includes:

> **Network engineering, operation and maintenance:** design, integration, deployment, operation and maintenance of a single, reliable, future-proof IP/MPLS over SDH network.

> **Migration of Transpower's mission-critical communications systems** to the new network, connecting 192 sites across the country.

> **Operations Support Systems (OSS),** including fault, problem and inventory management to support the operations of the communications network, and the ability to introduce and assure new services on it.

BENEFITS

With Alcatel-Lucent's solution, Transpower will obtain a homogenous, simple and robust communications infrastructure, enabling improved efficiencies and supporting the services and applications needed for the renovation and enhancement of the National Grid. In addition, the solution will:

> Simplify a complex array of point-to-point, non-scalable networks.

> Extend IP capability from 45 to 192 sites.

> Reduce the number of equipment types in the network from 115 to 12.

> Reduce the number of vendor interfaces from 28 to 3.

> Support new services, e.g., advanced SCADA, substation automation and enhanced security.

> Provide 18 business services, to agreed SLAs.

> Provide centralized inventory and assurance functions.

> Substantially reduce network operating costs.

ABOUT TRANSPOWER

> Transpower, a state-owned enterprise, is the transmission owner and systems operator of New Zealand's power system.

> The company owns and operates an approximately 12,000 km high-voltage power grid with some 192 substations, offices and switchyards.

"Alcatel-Lucent is helping us bring together multiple legacy and future technologies onto a single, easy-to-manage platform, in a reliable and achievable communications solution that will deliver operational savings and efficiencies into the future"

Jim Tocher, General Manager Information Services and Technology, Transpower

Alcatel-Lucent's Perspective

CUSTOMER REQUIREMENTS

Transpower's current telecommunications network environment requires renewal to support the grid investments planned over the next ten years. The communications network must be robust, available and future-proof, and use tried and tested technologies. It also must support – in real time – the full variety of operational services associated with a modern electricity transmission network.

In seeking a solution for a modern communications network, Transpower needed a partner that could provide:

- **Lifecycle management:** Transforming the existing telecommunications and networking resources over a five-year period, while providing a vision for future evolution of the network.

- **Operations management:** Operating and maintaining Transpower's telecommunications network, ensuring efficient, high-level service delivery.

- **New architecture:** Developing a highly robust, scalable telecoms architecture in line with Transpower's mission-critical requirements.

Paul Janeck
Alcatel-Lucent
General Project Manager

"As a technology leader, Alcatel-Lucent is helping Transpower meet the challenges and demands of a changing communications environment, while delivering the reliability, availability and robustness required to support vital power transmission systems."

OUR METHODOLOGY

The Alcatel-Lucent project began with intensive planning and preparation, developing the following elements:

1. The contract, which consists of a demanding regime of Key Performance Indicators (KPI).

2. A high-level solution design of the new national communications network.

3. A five-year project plan for network transformation.

4. Business-case planning, containing the detailed architecture.

5. A price book that sets individual unit and typical configuration prices for the duration of the five-year plan.

DELIVERY CHALLENGES

Key delivery challenges for Alcatel-Lucent include:

- **Managing site access processes, due to the high-voltage working environment:** Alcatel-Lucent has established strategic relationships with existing field service contractors, who will carry out all deployment activities, enabling Alcatel-Lucent to fulfill the project's demanding safety requirements.

- **Migration of services:** Throughout the migration process, Alcatel-Lucent is committed to ensuring service continuity for the mission-critical services that effectively control Transpower's power line assets.

- **Network design to support mission-critical services:** the network architecture has to be carefully considered to support a variety of critical services, such as teleprotection with its very stringent network requirements, legacy SCADA communications with its ultimate migration to e-SCADA, operational voice, CCTV, etc.

THE ADDED VALUE

Alcatel-Lucent's solution will bring Transpower the capacity and flexibility of a modern network, providing a highly reliable mix of TDM communications for protection and legacy services, with IP networking for Transpower's evolution to modern energy technologies. The TDM capability will provide the necessary time-sensitive communications channels needed by teleprotection services. With public service providers progressively withdrawing TDM in favor of IP, Transpower needs its own TDM capability, independent of public operators, to sustain these vital services.

The Transpower Solution at a Glance

THE BUSINESS SOLUTION

Alcatel-Lucent is providing a highly reliable, modern telecommunications network to Transpower New Zealand, the national electricity transmission grid operator, to replace its aging legacy communications network, which has neither the capacity nor the functionality to support the major upgrades to the National Grid planned over the next ten years.

The Alcatel-Lucent solution, based on delivery of a scalable, future-proof IP/MPLS over SDH network, includes system design, integration, deployment, operation and maintenance, as well as the migration of Transpower's mission-critical communications to the new network, connecting 192 sites nationwide.

THE TECHNICAL SOLUTION

Services scope

- **Design, integrate and deploy** a resilient nationwide communications network
- **Operations:** Network Operations Center, including operational processes
- **Maintenance:** Full suite of support services for Alcatel-Lucent and third-party products

NGN Network

- Alcatel-Lucent OMSN 1660 and 1662 – multiservice (TDM and Ethernet) transport – access, aggregation and core
- Alcatel-Lucent 7710 SR – multiservice MPLS layer supporting VPRN and VPLS
- Alcatel-Lucent 9500 MCX – digital microwave radio transmission
- Alcatel-Lucent OmniPCX (call servers, Unified Communications applications, gateways and handsets); PABX and applications supporting both VoIP and TDM for operational voice and corporate voice
- Alcatel-Lucent OmniSwitches – LAN switches
- Nokia TDM multiplexers – legacy interfaces, e.g., for teleprotection, SCADA
- Alcatel-Lucent 5620 SAM, 1350, OmniVista – element managers

Operations Support Systems (OSS)

- Alcatel 8920 PrM – based on the Remedy platform – trouble ticket, problem and work order management
- Amdocs Cramer Inventory Management System – modeling of physical and logical network resources
- IBM Tivoli Netcool – view network alarms; perform root cause analysis and service impact analysis; create automated trouble tickets

KEY FEATURES

Lifecycle management: Alcatel-Lucent is providing full lifecycle management for the solution, including all network elements, to ensure that Transpower's communications network remains fully responsive to the company's evolving needs. The five-year project will transform Transpower's existing telecoms resources, while providing a sound foundation for the future.

Incident management: As part of operations management, Alcatel-Lucent will take control of the incident lifecycle, from the time an incident first develops until it is fixed.
This will be achieved using an end-to-end, prime vendor service model that includes:
- A centralized Network Operations Center (NOC) in Hamilton
- A redundancy site in Christchurch

- Efficient and timely after-hours support
- Streamlined resourcing

Highly stable network architecture: Alcatel-Lucent is implementing a traditional three-tier architecture consisting of an access layer, aggregation layer and core layer.

Operations Support Systems to support the new IP/MPLS network and legacy TDM network:
- Centralized Inventory System to manage the networks' physical, logical and service layers
- Centralized Alarm Management System to provide a consolidated view of all alarms
- Problem Management System to manage network trouble/problem tickets and ensure their resolution

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