Transpower New Zealand
Providing modern grid communications for New Zealand’s National Electricity Grid
“Nokia helped us bring together multiple legacy and future technologies onto a single, easy-to-manage platform, in a reliable and achievable communications solution that delivers operational savings and efficiencies now and into the future.”

**Cobus Nel (General Manager – Information Services and Technology, Transpower)**
Executive summary

**Challenge**
Transpower, New Zealand’s electricity transmission grid operator, needed a reliable communications network to ensure optimum management of its modern power system to replace its aging legacy communications network, which had neither the capacity nor the functionality to support the major upgrades to the National Grid planned over the next ten years.

**Solution**
Nokia has provided a highly reliable, modern telecommunications network to Transpower. The Nokia solution, based on delivery of a scalable, future-proof IP/MPLS over SDH network, includes system design, integration, operation and maintenance.

**Results**
Transpower obtained an intelligent, secure and adaptive communications infrastructure, enabling improved efficiencies and supporting the services and applications needed for the renovation and enhancement of the National Grid. With our network security is ensured since real-time information is shared across a single network to inform the decision-making process and quickly avoid and contain power disruptions.

“The building of our new TransGO network has enabled us to standardise our telecommunications solution across all of our sites, we have managed to reduce the number of equipment types in the network from 115 to 12 and reduce the number of vendor interfaces from 28 to 3. This makes it much easier to understand how each site is configured and gives us certainty around future deployment costs. The ability to deliver both legacy and IP services on the same network has enabled us to continue to deliver the same services we always have as well as opening up the ability for new and innovative services to our remote sites. We are seeing a real business need for new IP Services which we weren’t able to provide before”.
Transpower’s perspective

Challenges
In New Zealand, power systems were being run harder than ever before. This was 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, needed 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 partner Nokia, because of the company’s depth of engineering, product and operational expertise, multi-vendor capabilities, and experience in working with utilities. Nokia’s solution includes:

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

- 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.

Results
With Nokia’s solution, Transpower obtained 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:

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

- Extends IP capability from 45 to 192 sites.

- Reduces the number of equipment types in the network from 115 to 12.

- Reduces the number of vendor interfaces from 28 to 3.

- Supports new services, e.g., advanced SCADA, substation automation and enhanced security.

- Provides 18 business services, to agreed SLAs.

- Provides centralized inventory and assurance functions.

- Substantially reduces network operating costs.

Why Nokia
Nokia’s solution brings 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 provides 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.

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.
Nokia’s perspective

Customer requirements
Similar to many electricity Grid operators around the globe, Transpower’s previous telecommunications network environment required 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.

Nokia has done this transformation for transmission and distribution Grid operators worldwide. As Telecommunications experts on IP-based infrastructure, we have an extensive transformation experience building IP, optical and radio operational networks.

Our methodology
The Nokia 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.

Delivery challenges
Key delivery challenges for Nokia were the following:

- **Managing site access processes, due to the high-voltage working environment**: Nokia has established strategic relationships with existing field service contractors, who carried out all deployment activities, enabling Nokia to fulfill the project’s demanding safety requirements.
- **Network design to support mission-critical services**: the network architecture was 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 technical solution

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

NGN Network
- Nokia 7750 SR and 7710 SR
  - Multiservice MPLS layer supporting VPRN and VPLS
- Nokia 9500 MXC
  - Digital microwave radio
- Nokia optical network
  - Multiservice transport
  - Access, aggregation and core
- Nokia 5620 SAM, 1350 OMS
  - Service, network and element management

Operations Support Systems (OSS)
- Amdocs Cramer Inventory Management System – modeling of physical and logical network resources
- IBM Tivoli Netcool
  - View network alarms
  - Perform rootcause analysis and service impact analysis
  - Create automated trouble tickets
Key operational features

Lifecycle management
Nokia provided 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 project transformed Transpower’s existing telecoms resources, while providing a sound foundation for the future.

Incident management
As part of operations management, Nokia took control of the incident lifecycle, from the time an incident first develops until it is fixed. This was 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
Nokia implemented 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

To know more about the case, please contact your Nokia salesperson.
About Nokia

We create the technology to connect the world. Powered by the research and innovation of Nokia Bell Labs, we serve communications service providers, governments, large enterprises and consumers, with the industry’s most complete, end-to-end portfolio of products, services and licensing.

From the enabling infrastructure for 5G and the Internet of Things, to emerging applications in digital health, we are shaping the future of technology to transform the human experience. networks.nokia.com

Nokia is a registered trademark of Nokia Corporation. Other product and company names mentioned herein may be trademarks or trade names of their respective owners.

© 2018 Nokia