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.

TRANSPOWER

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

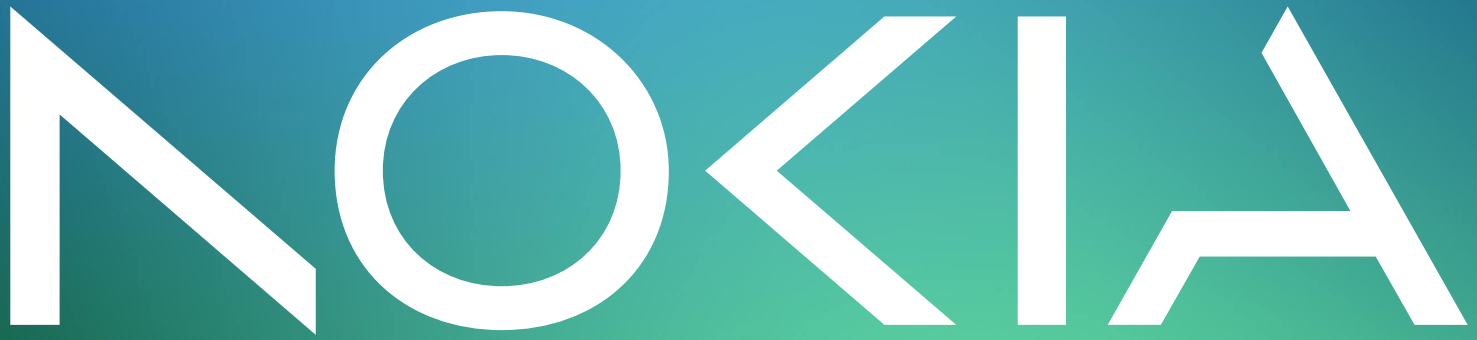
To know more about the case, please contact your Nokia salesperson.

Nokia OYJ
Karakaari 7
02610 Espoo
Finland

Tel. +358 (0) 10 44 88 000

CID: 155964

nokia.com



At Nokia, we create technology that helps the world act together.

As a B2B technology innovation leader, we are pioneering the future where networks meet cloud to realize the full potential of digital in every industry.

Through networks that sense, think and act, we work with our customers and partners to create the digital services and applications of the future.