

ElectroLink

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**Transpower powers
up with Prysmian**

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Transpower powers up with Prysmian

Underpinning the electricity industry in New Zealand is a national grid of high voltage conductors on which we rely for a secure and continuous supply of electricity. And behind the durability and performance of these conductors is a cable manufacturer committed to ensuring that all of Transpower's new lines will last the 40 to 50 years expected of them.

Recent innovations by Prysmian New Zealand are providing Transpower greater confidence in the longevity of its conductor assets and the grid owner's commitment to New Zealand of a secure electricity supply.

A significant threat to the ability to supply electricity securely is corrosion damage to the overhead conductors caused by salt-laden coastal air which can shorten conductor life.

Thanks to an advanced greasing technique developed in 2013, Prysmian is able to provide Transpower with fully greased conductors, which reduces the risk of these conductors corroding or ageing prematurely.

This design innovation, along with the commissioning of a creep test laboratory that now gives grid and network owners more certainty when designing new lines, are part of Prysmian's commitment to adding value to the huge range of conductors and cables supplied by Prysmian to all sectors of



Tony van Maanen and Joshua Butterfield



Teams from Prysmian and Transpower are working closely together to produce long-lasting line upgrades

the industry, says general manager Tony van Maanen.

He says the company has come a long way since 1946, when it started making electrical cables in downtown Auckland. Known for many years as International Wire and Cable, the company has supplied a wide range of cables and conductors including low, medium and high voltage cables and domestic products such as neutral screens, TPS and flexible cables.

The range of cables available today massively expanded in 2007 when the company was acquired by Pirelli, which spun off its cable business into what has become known as the Prysmian Group.

Added value

Joshua Butterfield, Prysmian's national power and distribution manager, says being a local manufacturer, as well as being part of

the largest energy and telecommunications cable manufacturer in the world, enables Prysmian NZ to offer competitive pricing and strong technical support by being able to call on engineers from Prysmian's 89 production facilities all over the world.

But this takes nothing away from the contribution of the Prysmian NZ team who developed the comprehensive greasing system required for Transpower's new conductors now being strung on the two lines running between Haywards and Bunnythorpe substations.

Transpower's category manager for lines and cables, Mike Burrow, says because this line runs up the Kapiti Coast it is particularly susceptible to salt penetrating the interstices of the steel core.

"This can cause galvanic corrosion between the strengthening core and the aluminium wires and the best way to prevent

this is by ensuring an impenetrable grease barrier is packed in during manufacturing to keep out the salt."

He says ensuring continuous and complete grease coverage is a challenge for conductor manufacturers and one that Prysmian has responded to successfully.

"Prysmian has come up with techniques and controls that eliminate gaps or 'grease holidays' by maintaining grease flow consistently through any process disruption such as when the machine is shut down."

Mike Burrow says Transpower engineers were able to analyse documentation, view the manufacturing process and the effects of production line interruptions, and observe how the PLC controls were effectively delivering consistent corrosion protection.

"It's the most advanced system we have seen."

Joshua Butterfield says Prysmian NZ was able to invest in the development of the advanced greasing solution because the company had entered into a period supply agreement with Transpower in 2013.

"We have been manufacturing conductors for Transpower for 20 years and becoming the grid owner's preferred supplier of AAC and ACSR/AC overhead conductors has enabled us to invest in value-adding services and ongoing quality improvements. These improvements are also of benefit to local network owners as they carry through to all the conductors we make."

Performance verified

Transpower is now seeing the fruits of this supply agreement in the 750 km of Zebra ACSR/AC conductor being made for the Bunnythorpe-Haywards upgrade project north of Wellington.

The new conductor replacing the existing 30-year-old 220 kV line is larger



New greasing techniques developed by Prysmian now ensure all HV conductors produced last their design life

and will deliver an increased transmission capacity. Stage 1 of the project is well underway with the first conductor shipment having rolled out of Prysmian's plant in October last year.

But before the first metre of conductor was made, serious design work of the replacement line had to be undertaken to ensure that, under all operating conditions, the lowest point of every catenary would sit above the minimum heights allowed by regulation.

Tony van Maanen says Prysmian saw an opportunity to help Transpower optimise its design calculations and, in conjunction with Transpower, built a 'creep test' laboratory in its Auckland plant to predict the permanent elongation of the conductor due to everyday tensions and thermal effects it will be subjected to over a period of time.

"We brought all our technical expertise to this project to help Transpower eliminate cost and risk from the design process."

Chee Yew Ng, Prysmian's engineering manager, says the company designed the tests to meet Transpower's requirements, (a combination of AS/NZS 3822 and IEC 61395) under a computer-controlled management system. This involves complex data acquisition and measurement capability.

"It's the only testing facility of its type in New Zealand and is helping Prysmian and Transpower better understand overhead conductor behaviour which Transpower uses to determine the optimum span distance between structures. The goal is to improve design assumptions and ultimately improve the lifespan of the conductors."

Cameron McKay, Transpower's overhead line design investigation manager, says it is a real value-add having the laboratory in New Zealand and it is beneficial to Transpower's investigations.

"It is important to understand the long term creep behaviour of the conductor to ensure we can provide a safe and steady supply of electricity to consumers. We've had conductors tested in other labs overseas with varying results. What we are looking for is consistency and repeatability of results that we can rely on in design. Working with Prysmian's



Prysmian's new 'creep test' lab aids line design by predicting long-term conductor behaviour

laboratory is helping us to verify our design assumptions and that the conductor, as manufactured, performs as expected."

Prysmian supports this quality focus with its testing to more than just local standards, says Tony van Maanen.

"We have a global quality management system which often exceeds the requirements of our ISO 9001 compliance. This applies to cable manufacturing across our three market divisions covering power distribution, trade and industry and telecommunications."

Prysmian also supplies the telecommunications industry with a wide range of fibre products including the majority of the nation's fibre for the ultrafast broadband rollout. The company has about 50 staff in New Zealand, representation in Wellington and plans to expand warehousing and distribution to Christchurch this year.

"Our highly skilled and experienced people know what it takes to make cables that consistently perform well. Throughout the international group we are always addressing customer feedback and the potential improvements we could make in our regular quality forums.

"Our customers are the most important people in the world. Prysmian will ensure all dealings with us are effortless and continue to provide quality products at competitive prices." ■

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