

Hiko Power Engineering



Hiko

Rail Profile

Solutions for electricity and rail networks delivering certainty, long-term value and reliability by design.

Contents

Introduction	1
Railway Catenary System Solutions	3
Innovation & Solutions	6
Bowthorpe Line Tap	9
The U-Pillar	10
Training	11

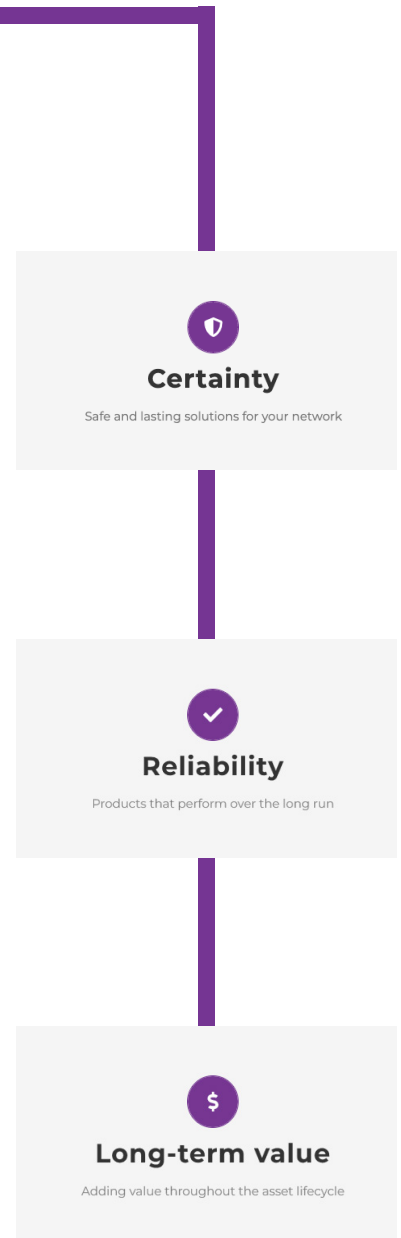
Introduction

For over 80 years Hiko Power Engineering has supplied the power and rail networks with equipment, components and tools from trusted brands including Pfisterer, NKT, Mosdorfer and Klein Tools. We work closely with our customers and our international supply partners to develop and supply quality products and solutions for New Zealand's electricity networks.

Our diverse and capable team includes degree qualified electrical engineering and operations management, as well as registered electrician and test technician skills. Technical, logistical and customer management specialists are located in Auckland and Christchurch. Our technical team's engineering expertise and experience with our applications is well known and allows us to provide robust and responsive technical support.

By working with our customers and with respected industry partners we deliver comprehensive training, installation and certification to ensure that the most current information and techniques is delivered to the end user. This approach also allows us to offer manufacturer-backed extended warranties.

At Hiko Power Engineering we deliver certainty, reliability and long-term value based on the products that we supply and on the technical support that we provide.



PFISTERER



Railway Catenary System Solutions.



Tensorex C+

Spring Automatic Tensioning Device for Railway and Tramway Overhead Contact Lines

The overhead contact lines of railways and tramways are exposed to variation in temperature – both from the day/night cycle and in the course of seasonal changes. This makes it necessary to constantly and reliably compensate for the resulting expansion and contraction of the contact wire in order to guarantee efficient train services.

As a full-service provider in the field of rail infrastructure, PFISTERER has developed TENSOREX C+, and in partnership with Mosdorfer and Hiko Power Engineering we provide an innovative solution that is clearly superior to conventional weight-based tensioning systems.



PFISTERER

TENSOREX C+

Benefits: Tensorex C+

01 Maintains a constant pulling force.

02 Low hysteresis effect over pull [P] value.

03 Compact device without weights fits anywhere.

04 Much lighter than traditional solutions.

05 Low visual impact & very difficult to vandalise.

06 No routine maintenance required & easy inspection.

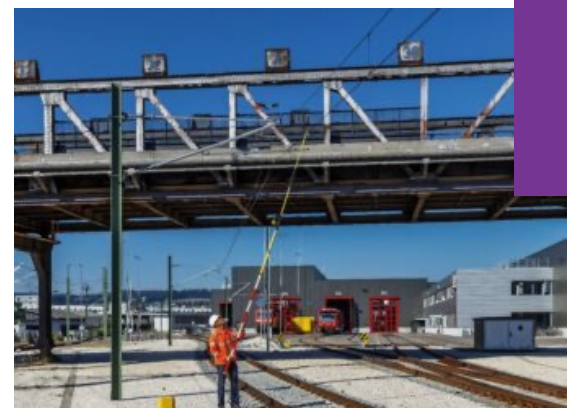
07 Does not require power supply nor oil nor gas top-ups.

08 No impact on performance due to temperature variations.

Other Railway Solutions

Better capacity utilisation of railway lines, denser intervals between trains and higher speeds mean that stresses and strains on overhead lines are constantly increasing.

Hiko Power Engineering and Mosdorfer Rail offer overhead contact solutions and an extensive range of Cantilevers, Connectors, Suspension clamps, Catenary Laser Measuring Devices, Insulators, Power Supply and Safety Equipment.



Insulation Technology

Insulators are a key component in all energy networks including on electrical overhead lines and in distribution stations.

Mainly porcelain or composite insulators are used in railway engineering. There are no functional differences between the two types of material – but porcelain or silicone may be advantageous depending on the application.

Talk to the Hiko team for all your rail insulation needs.

Power Supply

We are constantly working on solutions to make installation easier and safer, and energy networks more efficient.

At Hiko Power Engineering we have an extensive portfolio of Mosdorfer Power Supply products for all applications and for connecting all common conductors – whether between stations or in substations.

Talk to us today about our rail power solutions.

Safety Equipment

Safety equipment is one of the most sensitive aspects of railway electrification.

Hiko and Mosdorfer offer a complete range of voltage detectors, earthing and short-circuiting devices, as well as earthing and operating poles, which can be matched to any requirement thanks to modular system design. Our safety equipment represents the highest international standards of quality, safety and reliability.

Power Engineering Solutions

for electricity and distribution.



Pillars, Cabinets
& Frames



Underground Network & Service Boxes



Disconnects & Fuses



Cable, Joints
& Terminations



Network Fittings
& Accessories



Network Monitoring



Tools, Measurement
& Test Equipment



Overhead Switchgear
& Disconnectors

www.hikopower.co.nz

Innovation & Solutions.

When the company known today as Hiko Power Engineering began supplying electrical equipment, components and tools to electricity utilities 85 years ago, designing and manufacturing its own product solutions for power distribution networks was not part of the plan.

But today it is a major driving force of the company having developed advanced assemblies that make connecting assets to networks safer, easier, more reliable and longer lasting, says Hiko Power Engineering general manager Geoffrey Sullivan.

These Hiko innovations include underground distribution pillars (UDPs), underground service connections for branching networks (U-Pillars), network link boxes, link pillars and distribution cabinets and modular LV frames for transformers.

Sullivan says Hiko Power Engineering has come a long way since Harry Hamer left Gough, Gough and Hamer, along with the company's electricity product agencies. The company began manufacturing in 1959 in partnership with Bowthorpe and today Hiko manufactures the Bowthorpe HD series of line taps as its own brand and supplies product locally and to countries around the world who use British standards in their networks.

While the company continues to supply products from its exclusive European agencies such as EFEN, NKT, Pfisterer, Weber, Langmatz, Polaris and Gridkey, Hiko Power Engineering is now both a supplier of components and an engineering company designing and manufacturing assemblies for electricity distribution systems.

Sullivan says there is a lot more science and engineering that goes into the solutions the company makes today, and it was their customers that drove them down that path.

"About 20 years ago network operators were happy with the products and components we were supplying through our agencies. They were using some of them to construct distribution pillars, low voltage frames for transformers and other

subassemblies but were not satisfied with the consistency of the results they were achieving in the field.

"To improve this, they asked us to go the next step and make up assemblies for them in a controlled work-shop environment, then ship each assembly as a complete plug-and-play unit they could rely on and simply install it.

"So, while we were established as an importer and distributor of electrical products for the electricity supply industry, the design and manufacture of our own assemblies and products to recognised standards has also become a major focus.

"Sullivan says all their engineered solutions are quicker to install and reduce cost at time-critical sites.

Innovation

The company's most recent innovation is the U-Pillar which utilised the expertise in underground switchgear developed by the Hiko engineering team in its development of its UDP distribution system.

The Hiko UDP (underground distribution pillar) combines industry standard fusegear including EFEN DIN-type disconnects with Langmatz modular pits for distribution, reticulation and service supplies up to 1000 amps. Engineered to last, the underground pillar protects the fusegear by housing it under a composite 'bell' cover which creates a permanent air pocket for the fuses to safely operate in.





The U-Pillar has been designed in close collaboration with customers.

While the principle of using an upsidedown air cavity to protect underground switchgear in flood conditions has been long established overseas, Hiko introduced it to New Zealand 12 years ago in its UDP family of underground link boxes. Today many electricity networks benefit from the technology developed by Hiko Engineering and utilise the UDP range with up to six circuits and a mix of bus couplers, vertical fuses and switches.

Hiko Development and Engineering Manager, John Spence, says their successful adaption of the air pocket technique in the UDP range, enabled Hiko to extend it further in the development of its U-Pillar.

Now up to 100 amp fuses and 160 amp horizontal disconnects can be designed into customisable U-Pillars covered by Class B and D lids for high traffic areas and roadways, says Spence.

“We designed the U-Pillar as a complete pre-wired unit that keeps the fusegear dry under a transparent bell. While you have to pump out any water to carry out maintenance on UDP switchgear, we designed the smaller U-Pillar to allow the whole fuse stand to be lifted out of the water and worked on securely above the ground without having to use a pump.”

Spence says products like the U-Pillar have been developed in close collaboration with customers to

ensure the final solutions take away the risks they face with potential installation and maintenance errors using traditional methods.“

The high engineering values we design into each product provide a lot more certainty that our U-Pillars, UDPs and LV frames will deliver consistency and reliability by design to meet both the safety and lifetime expectations of network operators,” says Spence.

“They might not open a cabinet for years, but they can rely on our solutions to deliver safe, predictable and easy access for maintenance work at any time of the night and day and under any conditions.”

To ensure this safety and performance by design, Hiko mechanical and electrical engineers worked with network contractors on site, sometimes in the middle of the night, to understand the issues they faced.

“We addressed these problems through risk analysis and applied a range of mitigating solutions such as touch reduction, arc initiation protection, lowering the weight of designs and making them modular so products like LV frames are easier to work with,” says Spence.

“While our focus is on ensuring the safety of everyone installing and maintaining the equipment, we also ensure the safety and performance of the network architecture through precision engineering, material selection and comprehensive testing.

“We stress-test risk elements in our designs like thermal testing of busbars and underground products to ensure they remain within tolerable limits under full load. We also test insulator strength and stress-test busbar mounts to ensure they will not fail under extreme conditions.

” Further engineering and high voltage testing is carried out in the EPECentre at Canterbury University.

Customised Solutions

Geoffrey Sullivan says Hiko Power Engineering continues to develop its asset solutions with more than half the company's production today being customised to meet the standards and requirements unique to each network, regardless of the age and type of transformer.

"We have developed an extensive library of CAD designs to enable us to provide any design variation for a lines company based on the pre-engineered combinations we have already established. This enables us to minimise downtime for our customers where an emergency replacement is required.

"We also supply CAD drawings to customers with quotes so they know what they are getting before the product turns up so they can verify beforehand, for example, that every frame fits the intended transformer."

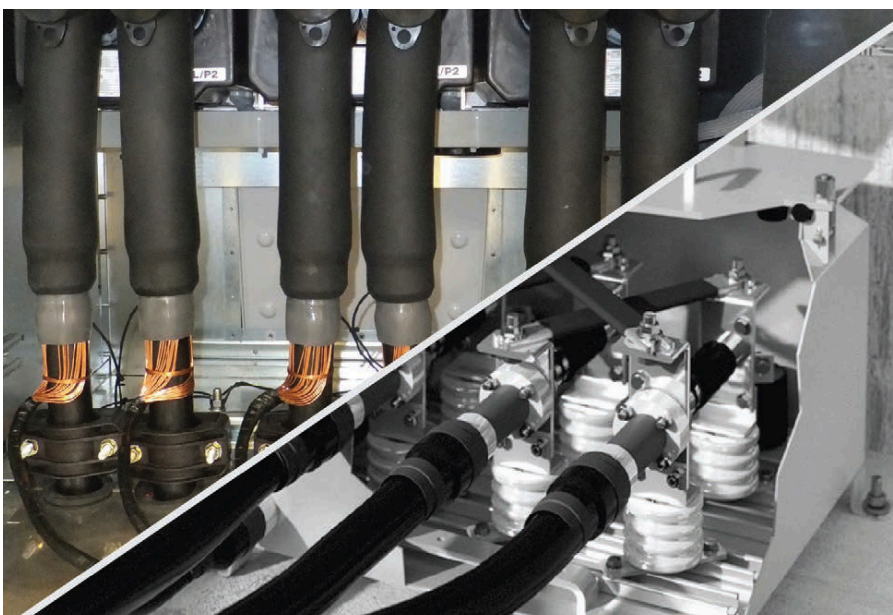
Hiko's South Island key account manager, Mike Scott, says while Hiko engages with its customers very effectively and collaboratively at an engineering and design level, the company also continues to supply a large portfolio of quality European components and equipment designed to connect assets to networks..

"We supply everything from Bowthorpe line taps, Pfisterer IPCs and fuse holders for overhead line connections, through to Insulect substation disconnectors, electronic sectionalisers, and airbrake switches.

We also supply underground NKT and Pfisterer LV, MV and HV cable accessories to connect the network to transformers, LV frames and substation switchgear."

While these products take care of connectivity between network assets all the way to the end-consumer, Hiko is also supporting network planners, engineers and operators with remote monitoring of LV loads using the Gridkey system.

Scott says by installing a Gridkey low voltage monitoring device on an LV-frame, actionable real-time data can be gathered to detect phase imbalances, warn of potential voltage and temperature problems, monitor total harmonic distortion (THD) and assist in fault location.



He says Gridkey also provides network companies with tracking data over time so that they can more effectively plan for network upgrades. This type of monitoring can help networks future-proof against the impact of PV and EV installations.

"Hiko Power Engineering is the ideal partner to help manage changing LV loads with the latest technology. This includes frames with fused switchgear or with remotely controlled MCCBs – all designed to protect networks and communities."

The U-Pillar.

The most vulnerable point in any network supply of electricity to a house is the pit or pillar providing the connection and solutions that have been developed over many years to make them safe.

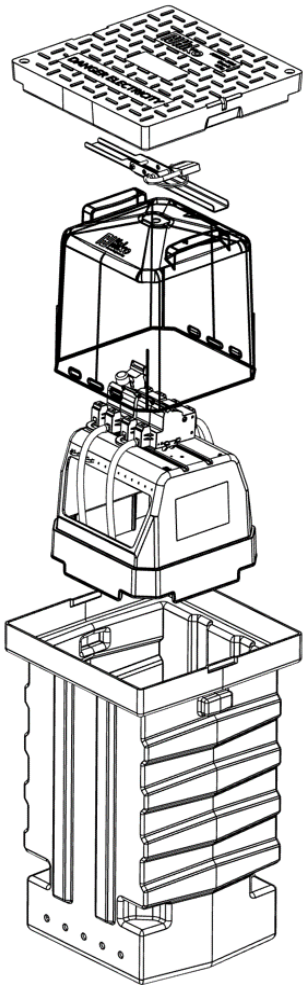
The introduction of underground pits helped eliminate safety risks from vehicle and above ground damage while water ingress protection on key components provided protection underground to ensure continuity of supply.

Today, a new pillar designed by Hiko Power Engineering has taken a different approach to underground protection by bringing the electrical safety advantages of an above-ground pillar to a belowground installation.

The pre-assembled U-Pillar is an underground pillar designed to encase the fuse gear in a submersible and protective air pocket and remain just as electrically safe as if it were installed above ground, says Hiko general manager, Geoffrey Sullivan.

He says the entire U-Pillar also creates an arc ignition protection zone, making it safer for installation and servicing.

Additional safety is provided by mounting the fuse carriers in a self-contained, pre-wired stand that can be lifted out above the ground for easy connection, livening and maintenance access to the dry fuse gear. This insulated raised stand is covered by a transparent, airtight, insulated bell enclosure which latches to the stand and traps all the air needed to keep the electrical connections dry, even when the pillar is completely submerged. It is secured in place with a vandal-resistant locking bar.



Network & Service Connection

Hiko general manager, Geoffrey Sullivan, says after five years of development the range of U-Pillars designed and manufactured by Hiko Power Engineering solved many of the risks inherent in pits and pillars and the maintenance issues that arise.

Hundreds of U-Pillars have already been installed across New Zealand, says Sullivan, and Hiko is providing local and webinar training in U-Pillar wiring to help electricians and inspectors gain the advantages of quicker, easier and safer installations while maintaining the integrity of distribution networks.

For the network company field service partners, installing a U-Pillar is as easy as plug-and-play because it is prewired. The steel-reinforced lid does not even have to be removed until it is time to do the insulation tests.

U-Pillars come with a 4-core tail to connect to the network with a branch joint or with separated cores using in-line shear-bolts sealed with heat-shrink tube.

On the service side, connecting to the U-Pillar is just as simple. Out-going cable tails are provided for each of the three power options in the standard-sized pillar. Whether the 6 x 63 amp, 4 x 100 amp or 3 x 160 amp option is utilised, the black outer-case dimensions are the same across the range.

Hiko's northern account manager, Hitesh Bhikabhai, says electricians need only leave enough extra mains cable in the trench from the house to connect to the out-going tails.

"There is no need to cut any holes in the pillar for conduit or cables because the pre-wired tails take care of everything required to safely connect the mains cable to the pillar."

"Depending on each network's requirements for connecting to boundary pillars, all the electrician or authorised livening inspector has to do is connect the mains cable to the pre-wired tails and proceed to the final connection and testing at the fuse carriers."

Bhikabhai says to ensure that the final terminations are correct, the multiple customer-side tails are paired (phase and neutral) and protected in a secured orange bag. The pairs are also pre-labelled with identification and phase colour coding that matches the fuse carriers mounted in the stand inside the U-Pillar.

Final Connection

When the tails in and out have been connected, there has still been no need to open the U-Pillar, yet it is now wired from the street to the house other than the final connection at the fuse carriers.

To lift the lid and complete the final connection, two M8 torx screws have to be removed. While every pillar is supplied with manufacturer's instructions for a safe and correct installation, a QR code on the removable locking bar provides instant online access to this guidance.

Once the lid is removed the retention bar can be unlocked and the fuse-carrying stand can be lifted out, turned 45 degrees and then set down on the internal base provided for the lid for easy above-ground work.

Bhikabhai is now providing advice and training for inspectors and electricians on UPillar installations and says the next stage is vital for accurate testing.

"As usual, testing is carried out before connecting the outgoing phase supply to the fuse holder using an instrument with a low impedance function (LoZ). This takes away any effect of the meter itself, especially if condensation is present under the bell.

"This will prevent a false ghost-voltage reading to allow work to continue safely. Once testing is satisfactorily completed, an authorised livening inspector can remove the protective cable caps and terminate the cables. The U-Pillar is then ready for fuse insertion and livening."

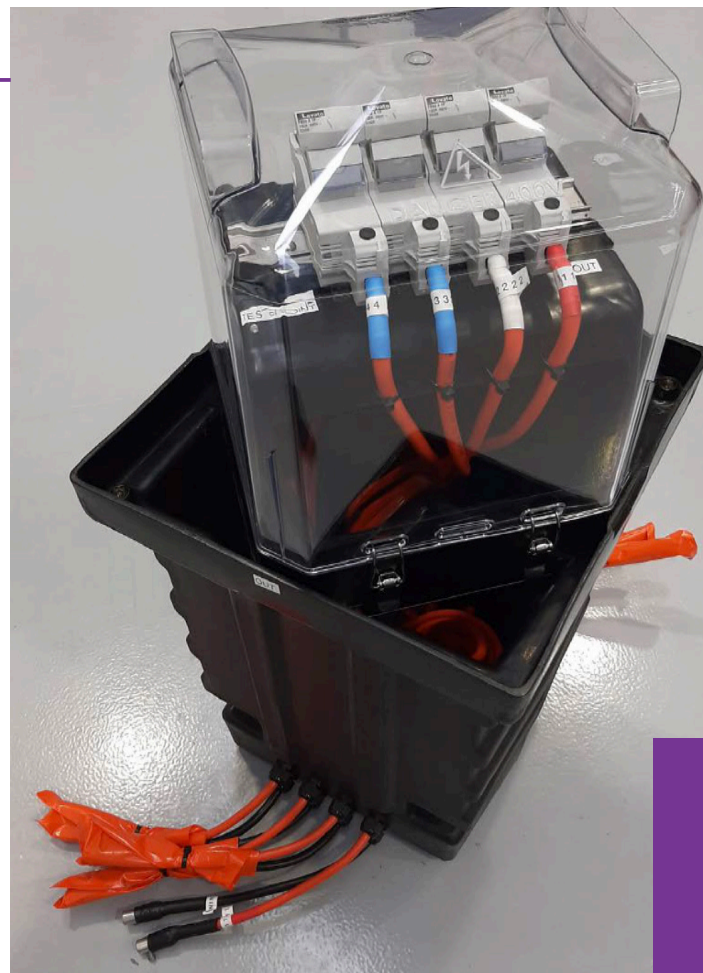
Hiko Development and Engineering Manager, John Spence, says condensation on the underside of the transparent bell is normal and any prolonged condensation eventually runs down the side of the bell or down grooves in the sloping base of the stand.

"The Bell also provides a vital safety function as part of the arc initiation protected zone we have designed into the U-Pillar. To maintain this safety zone, holes must not be made in the bell, pit or lid. Every aspect of the pillar design contributes to the safety performance, so any modification of the safety critical components such as the bell, the lid, structural supports or sealing components is simply not necessary, no matter how well-intentioned it might be."

Spence says the glanded cable tails are complete with shear-bolts for ease of connection and, because they are integral to the UPillar's IP4X rating for the arc initiation containment, they cannot be cut or removed.

Builder's Temporary Supply

If the U-Pillar is to be used initially as a builder's temporary supply, Hitesh Bhikabhai says the shear-bolts must be removed from the inline connectors and replaced with replaceable grub screws to fix the temporary BTS cabling. "Once the BTS has served its function, you can then wire the U-Pillar as the permanent supply by removing the temporary grub screws and inserting the original bolts in



the shear-bolt connectors. By winding the heads of the bolts off with an Allen key, you will ensure a perfect connection which you then must seal using heat-shrink with an adhesive internal layer to waterproof the connection."

Increased Pillar Range

Geoffrey Sullivan says the patent-pending U-Pillar has been designed and manufactured by the Hiko Power Engineering team in Christchurch as the next step in safer power reticulation to homes.

Until last year, Hiko Power Engineering was known as Hamer Power Engineering, a specialist supplier of power engineering solutions that formed in 1938 and has manufactured Bowthorpe products in Christchurch since 1952. Hiko also supplies Langmatz underground distribution pillars with Class D lids for motorways, polycarbonate equipment cabinets, and LV distribution and transformer frames.

Sullivan says Hiko's experience in customising pillars for individual lines companies has enabled it to develop the new U-Pillar as an advanced solution for all New Zealand network companies, with international enquiries arriving from countries prone to flooding.

Your network deserves the best.



The safe and reliable operation of electricity distribution lines depends on the quality of overhead line fittings.

Made in New Zealand since 1959, Bowthorpe HD Line Taps are high quality, robust, reliable and easily installed.

Try them, they are the best of the best. **Your network deserves them.**

Bowthorpe[®]

Hiko
Power Engineering

Advanced Training.

When a high voltage cable system fails, questions always arise as to the quality of the cable preparation carried out before the joints or terminations were made. Seasoned cable jointers know that you can never know too much about cable preparation for jointing and they are always honing their skills to a higher level to prevent such a failure.

Stepping up through the medium voltages to 66 kV and above requires advanced hand skills and specific knowledge. A select group of cable jointers were able to develop their skills in joint EHV cable preparation during a two-week training course held in June, in Auckland.

Arranged by Hiko Power Engineering, the course was well supported by the power industry and was presented by Brisbane-based Paul McLean. He focussed on different cable preparation techniques using practical and theory-based modules to ensure the design life of the accessory and system is achieved.

McLean is accessory supplier NKT's resident trainer and was brought to New Zealand by NKT in conjunction with Hiko Power Engineering to develop training course content to help address the risks the industry faces with only a small pool of jointers and few new jointers entering the industry.

Hiko General Manager, Geoffrey Sullivan, says although Hiko is the distributor of NKT products in New Zealand, the course was about the core skills needed to prepare any accessory in the higher voltage ranges and how to apply techniques like tool selection, XLPE preparation, shaping, glassing and plumbing to optimum effect.

The training demonstrated multiple ways to achieve the same level of cable preparation for different applications. This included techniques best suited to each installation environment. Particular emphasis was placed on the importance of safety, work area set-up, teamwork, attention to detail, understanding installation manuals and cleanliness, irrespective of the work location, whether it be an underground joint bay, termination structure or switch-room environment.



Sullivan says because Hiko has been supporting the power industry for 85 years, the company has a long-term focus as a trusted supplier.

“We understand the need to upskill the next generation of cable jointers to make sure they have the pre-requisite core skills to gain certification in the installation of any manufacturer’s accessories. We converted our Auckland branch into a training centre and brought in Paul Maclean as a world-renowned expert in many brands, not just NKT.”

He says the knowledge and experience of the trainer was greatly appreciated by all the attendees who had been jointing for 10 to 12 years at 33 kV and below. They were there for factory-level training to advance their careers by gaining certification in EHV cable preparation and techniques.

“We also invited consulting engineers, electrical engineers, KiwiRail and Transpower engineers to pop in to see the precision and thoroughness involved in the different techniques and machining necessary to deliver the joints they specify.

“It was a valuable experience for those not familiar with the detail required and to see it expertly displayed. Some sent in their peers to have a look and we appreciate the thankyou notes we have received.”


Hiko will provide more courses or arrange tailored training packages at NKT's training facility in Brisbane.



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