

A History of

MICROPROCESSOR PROTECTION RELAYS IN NZ

At the outset of 1996, the year that PT&D magazine was first published, Hatfield and Vaughan Power Measurements (later known as HV Power) launched the brand of Beckwith Electric (who make generator protection) to the New Zealand Power utility market.

What was unique at the time for Beckwith's technology was that it employed microprocessors and could communicate with other control and monitoring equipment in a typical generation situation i.e. PLCs and RTUs using a protocol called MODBUS.

These black boxes did the job of what had previously required several racks of electro mechanical devices. The concept of Integrated Protection and Control combined virtually all protection functions into one box and provided a front panel alarm annunciator and digital display of primary and secondary measurement values. All activities detected by the device could be reported through a serial connection to SCADA or a DCS.

Through the efforts of HV Power's people, Beckwith Generator Protection became recognised in New Zealand and was installed in many of the hydro stations in the deep south of the country. It is still frequently spec'd in upgrades of older technology.

ELECTRO MECHANICAL TO MICROPROCESSOR

Throughout the latter half of the last decade the name of HV Power became synonymous with the specialised field of protection relays. It was HV Power that launched the SEL brand in New Zealand in 1994 and who went on to establish "Blue Boxes" as the dominant range of protection relays in the local market.

As business grew, the founder, Geoff Vaughan, employed technicians from the industry who had practical experience with protection. His team helped customers make the transition from electro mechanical to microprocessor technology.

It was a whole paradigm shift that required time spent one on one with customers to gain their acceptance of a complicated technology. Along with it came not only a new vocabulary to learn – ANSI codes for every protective and control function – but also a shift from a very English (GEC) dominated discipline to acceptance of techniques and concepts used in the USA and in Europe.

Another technology concept introduced in 1996 was the RPM Power Recorder – an instrument designed to monitor power quality disturbances and take measurements of key power system parameters. What was unique at the time was that computer network communications were used to enable data to be uplifted from the recorder whilst it was installed out on site.

ANOTHER PARADIGM SHIFT

HV Power have continued to promote technologies that are on the leading edge and in 2004 demonstrated the first generation of Siemens IED's to be built to the new World Standard for Substation Automation – IEC 61850.

And so another chapter in technology is unfolding and another paradigm shift is taking form.

Following a trend that has already proven popular for years in IT, Industrial Process Control and more recently in telephony, ethernet is becoming the backbone for communications within the substation. It provides functionality simply not possible with traditional point to point serial topologies.



Protection Relay History Evolution

TECHNOLOGY ADVANCES

Reflecting on the changes in technology in the decade since PT&D magazine's first issue, HV Power's founder Geoff Vaughan says "Today, technology is as much about strong brand recognition and marketing as it is about tangible benefits delivered by particular manufacturers' products".

"Having worked with both North American and European suppliers, the differences in the various manufacturers' approach to the market is as diverse as the rhetoric of international politics".

"No one manufacturer or country has a monopoly on innovative ideas despite the claims made in the sales collateral of glossy brochures, creative websites and presentation material used to entice the engineer to use a product. Claims that Brand X product is 50 times more reliable than all other competitors products I'm sure is seen by most people in the industry as the marketer's triumph of Arrogance over Ignorance", comments Vaughan. "It's my experience of IED Technology that there are subtle differences between the products of the world's leading manufacturers. Being first to market with a new approach and having a 'never seen before' low price certainly helps to launch a product".

"However the success of a world class product in the New Zealand market – as measured by the uptake of that particular technology by customers – is largely due to the efforts of the local distributor and their marketing, but more importantly, the quality of the technical support they can access from their foreign suppliers" Vaughan concludes.



The modern look of a generator relay – first introduced in 1996.