

Acubis Technologies Delivers Australia's First Rajant Peregrine & Hawk Utilities and Mining Solution



A government-owned utilities provider in southwest Queensland Stanwell was battling the ever-evolving data and application requirements of their operational technology (OT) network. This OT network supports an array of site-wide systems and devices. They include CCTV, access control, environmental systems (noise blast and vibration), in-vehicle fleet management, fatigue management, digital fire alarm systems, manufacturing executing systems (MES), mining operational data warehouse, and industrial IoT edge devices.

Acubis Technologies was called upon to provide a wireless industrial networking solution capable of handling the utilities' provider demands. Acubis recommended the latest Rajant Kinetic Mesh® BreadCrumbs® the FE1 Series Peregrine and Hawk.

The Challenge

Harsh environments and conditions are ever-present in the industrial settings of utilities and mining. Stanwell is no exception. The Stanwell owns the Tarong power stations, which are one of Queensland's largest electricity-generating sites, so area dependency on sustained operations is paramount, as is security to protect the critical infrastructure, which is government-owned.

Multiple applications, video streams, real-time data transfer, and edge devices require steadfast, unfailing networking support intolerant of downtime. The terrain adds to the impossibility of most networks to be consistent with low latency and high throughput.

Towering ridges surround the mine. The high levels of infrastructure and electromagnetic interference produced by the power station are

The Customer

- The Stanwell-owned Tarong power stations are one of Queensland's largest electricity-generating sites. The site comprises four units, each capable of producing 350 MW and a single 443 MW advanced cycle coal-fired unit. The 443 MW unit uses the latest technology, making it one of Australia's most efficient coal units. The Tarong powerstations receive their coal from the Stanwell-owned Meandu Mine via a conveyor. The mine is critical to TPS and Queensland energy generation.

The Partners

- **Rajant** - Pioneers peer-to-peer radio communications enabling real-time voice, video, and data to connect machines, robots, and people together as part of a secure private mobile network.
- **Acubis Technologies** - A remote communication specialist focused on Rajant Kinetic Mesh; we are passionate about helping clients invest in the right networking solutions to stay connected. By understanding their unique operating environment, digital communications solutions are designed, implemented, and commissioned to deliver seamless connectivity.

Solution Components

- BC I Enterprise
- BC I Commander
- BC I Connector
- Rajant Slip Stream - APT Master
- Rajant Peregrine - Fixed Infrastructure & Wireless Communication Trailers
- Rajant Hawk - Mobile Plant, CCTV & Environmental Systems

challenging for RF signals to overcome. Due to network failure to cover the Ash dams and water pipelines, environmental impacts must be predictably avoided.

The Solution

Stanwell had previously tried to manage their site-wide communications using Ubiquiti and ABB Tropos. However, none of these technologies could support the requirements for low latency, high bandwidth critical applications in an ever-changing mobile environment. Those wireless technologies only support a “break before you make” approach, which is a fundamental flaw when designing critical mobile wireless networks. This approach causes significant losses in real-time data, which would directly affect daily operations and production. That is when Acubis was brought in. They identified and understood the issues while providing a solution to see the life of the mine.

The latest FE1 Series BreadCrumbs, Peregrine, and Hawk, with InstaMesh®, proved to be the industrial networking solution of choice for the client, providing high bandwidth and ruggedized mobile connections throughout their entire operations. Efficiencies of monitoring, safety, and communications met the dynamics to live-stream vast data continuously without interruption.

Rajant Peregrines were used as ingress points to connect via fiber to fixed infrastructure and transmitted over licensed Point to Point (PtP) links to 6x communication towers. Eight Peregrines were installed on mobile wireless communication trailers with Point to Multipoint (PtMP) backhaul to extend ingress points into low coverage areas due to the open-cut pit depth and the overall terrain of the mine.

Rajant Hawks were placed on mobile machinery for real-time data, live-streamed 24/7, 365 for machine data and operator safety. The Hawks were also installed on all CCTV platforms for real-time data stream without interruption or downtime. More Rajant Kinetic Mesh Hawks were affixed to environmental systems for continuous safety alerts. The Rajant Hawk was also chosen for integration onto the Groundprobe Slope Stability Radar, a critical piece of mine safety equipment.

All this technology is monitored and managed using Rajant's proprietary software BC | Enterprise and BC | Commander

“The Meandu Technology Roadmap highlighted that a prerequisite for Meandu to accelerate and realize the value provided by technology advances was the establishment of suitable networks and communications platforms. The Rajant Peregrine & Hawk are an integral OT infrastructure component. These BreadCrumb nodes maximize the use of the fleet management system, enable telemetry and high precision GPS technologies, and provide connectivity for CCTV, environmental, and control systems that operate across our Rajant wireless network.”

— **Julio Romani, Manager**

Business Improvement & Technology of Stanwell

installed on a localized VM within the Operational Technology (OT) Network.

Due to the remote locality of the Tarong Power Stations and Meandu Mine, Acubis registered licensed frequency bands for both PtP Infrastructure and PtMP. This addresses any potential interference allowing the Rajant network to operate unimpeded over the unlicensed spectrum.

This robust and secure Rajant network is the underpinning architecture to support current and future applications. Stanwell has plans to increase machine learning data requirements and business efficiency applications across the Rajant network to continuously improve day-to-day operations and integrates the data for cost-saving efficiencies in thermal power production.

The Results

Rajant's patented Kinetic Mesh offers peer-to-peer InstaMesh networking technology to perform real-time evaluation and direct traffic via the fastest pathways between wired, wireless, or in-motion points. Because of this, the client now has reliable, secure wireless connectivity throughout all operational areas. This critical data is secured from the edge device to the primary Dispatch and Operational Facility.

Since installation, the Rajant Kinetic Mesh Network has improved network reliability exponentially. The mine is developing further uses to take advantage of the network capacity, and with autonomous trials being conducted there is significant interest in the new LTE Peregrine.

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