

Westside chooses private wireless RF System instead of public mobile data

The Meridian Seamgas field operated by Westside is approximately 50 Km long by 10 km wide. This gas field already has operational Coal Seam Gas (CSG) wells with others planned for future expansion. Each operational well is monitored and controlled using an enterprise information system comprising of SCADA System software and RTUs. The RTUs connect to the HMI using a communications path that historically existed of a combination of RF point to point radios, and a public network based IP WAN over 3G.

Faced with the decision of security and system integrity, Westside have a business requirement to maximise the number of wells using their own managed RF infrastructure and be less reliant on public 3G infrastructure.

The lay of the landscape in the area dictates the network topology for the RF Backbone. Many areas of the gas field are not accessible using 3G data services.

This has led to the decision to implement an RF Backbone consisting of privately owned RF systems strategically placed to ensure as much of the gas field as possible has adequate RF signal. The RF network design is based on digital radios which are inherently secure due to their unique digital protocol. Additional security is provided by configuration of unique pass phrases. This modern approach to the selection of and implementation of secure data streams means that system criticality including sensitive operational data is protected from intrusion.

The scope of the RF backbone solution provided by Parasyn included the installation of antennas and radio equipment to two new towers and three existing towers. A study was performed on the entire gas field and an options analysis was conducted. The towers were ultimately strategically chosen to provide maximum overall system coverage to the gas field but with one major constraint. The main constraint was existing mains power needed to exist. Where coverage was not possible or unreliable, "store forward messages" were routed at the RF Packet layer via an existing site which has connectivity to the backbone.

The network is fully IP based. Radio devices support a deterministic configuration improving the overall throughput and performance of the SCADA system. Less important at the early stages of development and during initial roll out, this vital design criteria will become essential as the system scales for many more gas wells.

Parasyn managed the entire project working in closely with Westside project and operational staff. Contractors were used to perform specialist activities mainly related to heavy lifting of the towers.

Parasyn's scope included:

- Requirements development

- Systems and Component design

- Document the control and communications device's design and configuration

- Procure and supply communications equipment including towers

- Documentation and Project Management including mobilisation and resource coordination

- Configuration and system set up including staging

- Factory Acceptance test (FAT)

- Manage civil contractors

- Site Installation

- Site Acceptance Test (SAT) and commissioning

The 10 month long project had two major challenges. The first was a design challenge in that the location of the towers were not only based on the ideal position for full field coverage, but the chosen sites also had to have mains power availability. Ultimately this competitive tension compromised the main goal of optimised RF coverage, however, due to the flexibility and speed of message routing via alternative sites, the desired "all site connectivity" was achieved using indirect radio paths. The second challenge was site access due to weather. Despite local weather events impeding planned site works, the backbone was operational by the end of 2015 as agreed. This was made possible by being ahead of schedule and stepping into contingency strategies.