



Case study

Nationwide analogue to digital radio migration provides NIW with improved asset visibility and management

When Northern Ireland Water (NIW) decided to upgrade its entire radio telemetry network, upgrading approximately 2,000 radios from analogue to digital, they chose the Aprisa SR radio, with network installation carried out by EMR Integrated Solutions. With the unique Aprisa SR data driven protected base station, the migration could be carried out without any interruption to the traffic, the end result being a network with full radio and data redundancy.

NORTHERN IRELAND WATER

United Kingdom



THE UNIQUE APRISA SR DATA-DRIVEN PROTECTED STATION

APPLICATION AND DEPLOYMENT REQUIREMENTS

Northern Ireland Water was using a UHF telemetry radio network, operating in the licensed 400 to 470 MHz band, to monitor a range of water infrastructure assets, including treatment stations, pumps and reservoir water levels. However, the aging infrastructure meant that NIW's maintenance team had to spend much of their time getting to sites and investigating faults, and that repairs were often difficult and time-consuming. NIW therefore decided to carry out a complete telemetry network replacement.

The Northern Ireland Water network combined a number of demanding requirements to enable a future proof solution to upgrading a live telemetry network across the entire country:

- Replacing every analogue remote station and base station with new digital radios, with redundancy required for the base stations: a nationwide deployment of nearly 2000 radios
- Maintaining the continuity of the polling cycle to ensure that no traffic would be lost during the migration process: the challenges of a live network upgrade
- Ensuring that the system could be upgraded from serial to IP communications in the future as required: the future-proof approach

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The unique Aprisa SR data driven protected station configuration can seamlessly support the migration of a live network from analogue to digital radio, while providing the ability to upgrade from serial to IP communications in future.

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NETWORK DEPLOYMENT

NIW chose EMR Integrated Solutions and the Aprisa SR, with their combination of EMR's experience in utility radio and the unique Aprisa SR data driven protected station. This can seamlessly support the migration of a live network from analogue to digital radio, while providing the ability to upgrade from serial to IP communications in future. This configuration is available in the 400 to 470 MHz range and so NIW are able to use their existing spectrum allocations.

The Aprisa SR data driven protected station supports the operation of new digital radios within the existing analogue network. The configuration comprises two Aprisa SR radios, rack mounting shelves and RF cables. Switching is based on serial inputs, with the active radio determined by which of the radios receives data on its RS-232 serial port. This allows the SCADA system to have control. With this approach, the polling cycle is not interrupted during the migration process and the minimal disruption to the network is mitigated by master overrides at the SCADA master.

The network is being deployed using two one man teams from EMR Integrated Solutions, with each team replacing 10 to 15 sites per day. The implementation process is as follows:

- Deploying an Aprisa SR data driven protected station at the same site as, and in parallel with, an existing analogue base station
- Decommissioning each analogue outstation in turn, replacing it with a preconfigured Aprisa SR digital outstation, operating a combined analogue and digital network
- Decommissioning the analogue base station after the final digital outstation is deployed, resulting in a redundant, digital network

RESULTS

28 protected Aprisa SR base stations and more than 2000 outstations, all pre-configured to NIW's requirements, have been shipped from 4RF to EMR Integrated Solutions. To date, 17 base stations and over 1000 outstations have been installed, and the network will be fully complete in December 2012. The highest number of outstations connected to a single base station is currently 109. NIW now has improved network visibility and management capabilities, as well as better RF performance and increased data security. An additional benefit is that because of the enhanced management capabilities provided by the Aprisa SR SuperVisor management application and CastleRock's SNMPc network management application, previously undetected radio or antenna faults are being identified and rectified.

Future plans for Northern Ireland Water's network include migrating the SCADA telemetry network to IP using the Aprisa SR terminal server feature, and then replacing the monitoring equipment itself with IP remote terminal units.

ABOUT NORTHERN IRELAND WATER (www.niwater.com)

NIW is the sole provider of water and sewerage services in Northern Ireland, responsible for the supply and distribution of drinking water and the provision of sewerage services for approximately 780,000 domestic, agricultural and business customers throughout Northern Ireland. NIW supplies these services to a population of 1.7 million. The assets operated by Northern Ireland Water include 26,500km of water main, 1,265 sewerage pumping stations, 20 major water treatment works, 15,300 km of sewers, 450,000 manholes and 1,100 waste water treatment works.



Aprisa SR



One of NIW's installed base stations

About EMR Integrated Solutions

EMR Integrated Solutions (www.emrsolutions.ie) is a dynamic Irish company providing wireless communications, SCADA and automation solutions for customers throughout Ireland and overseas. Established in 1985 as a provider of automatic metering systems for telecoms operators EMR has become a leader in the delivery of integrated communications, control systems and microwave networks for industrial, commercial and utility clients. Working closely with industry leading manufacturers including Motorola, NEC and Schneider, EMR provide complete end to end integrated solutions including system design, software and hardware configuration, system installation and commissioning, on site and workshop maintenance and repair, 24/7/365 system support and maintenance.



ABOUT 4RF

Operating in more than 130 countries, 4RF provides radio communications equipment for critical infrastructure applications. Customers include utilities, oil and gas companies, transport companies, telecommunications operators, international aid organisations, public safety, military and security organisations. 4RF point-to-point and point-to-multipoint products are optimized for performance in harsh climates and difficult terrain, supporting IP, legacy analogue, serial data and PDH applications.

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