4RF

Indonesian Railways improves rail network safety and reliability with 4RF's Aprisa radio links

PT Kereta Api faced a major challenge: 6,000 kilometres of track and 571 train stations, many in remote tropical locations, and a mission to improve customer service, reliability and safety through better communications. Existing public communications connections were limited or nonexistent, and wired, fibre and satellite options were not commercially or technically viable. PT Kereta turned to the 4RF Aprisa family of point-to-point radios for a reliable, cost-effective, end-to-end network, carrying a range of voice and data traffic for better operational efficiency and safety.

APPLICATION

PT Kereta Api's ongoing strategy was to use technology to enhance customer service and improve reliability and safety. One key objective was to upgrade voice and data communications between the rail sector controller and the stations and trains in the area. PT Kereta needed a solution that could carry PBX telephony, private mobile radio (PMR), train control signalling and ticketing data efficiently in one link. Safety was a top priority: railway staff and signalling systems needed to have access to trustworthy communications and to ensure that small hitches would not develop into bigger safety threats.

DEPLOYMENT REQUIREMENTS

The critical requirements for PT Kereta's network were availability and reliability. A number of commercial and technical challenges needed to be met:

- Status and location information had to be available on demand, in real-time
- Many of the 571 stations were in remote, rural locations, typically separated by long sections of track, often in excess of 40 kilometres
- A large proportion of PT Kereta's 6,000 kilometres of track ran through tropical areas, presenting environmental challenges for radio links

WHY 4RF?

PT Kereta chose 4RF and its Aprisa platform for a number of key reasons:

- Carrier-class performance, making the Aprisa perfect for safely transporting even mission-critical voice and data
- Technical performance, with the Aprisa's ability to overcome the difficulties of making long distance links in environmentally challenging conditions
- 4RF's experience in network design and engineering, giving PT Kereta the confidence that the network would be highly cost-efficient without compromising on performance

PT Kereta Api
Indonesian Railways, Indonesia

Sumatra

Java

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We knew that having reliable voice and data communication links in remote rural areas was not only vital for safety, it was also a technical and commercial challenge. 4RF and Simoco proved they had the solution and the expertise to ensure we have a reliable, cost-effective and user-friendly system.
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— **Ir. Bambang Winarto**
Head of Signalling, Telecommunications and Electrical, PT Kereta Api

ABOUT PT KERATA API

Headquartered in Bandung, West Java, Indonesia's state railway PT Kereta Api operates a large and busy network. Its 6,000 kilometres of track extend throughout Java and Sumatra and carry more than 200 million passengers per year.

Since 1999, PT Kereta has operated as a limited corporation. The operator is currently implementing a strategy for change designed to make it Indonesia's main choice of transport for all sectors of Indonesian society. A major part of this process is to use technology to enhance customer service, reliability and safety.
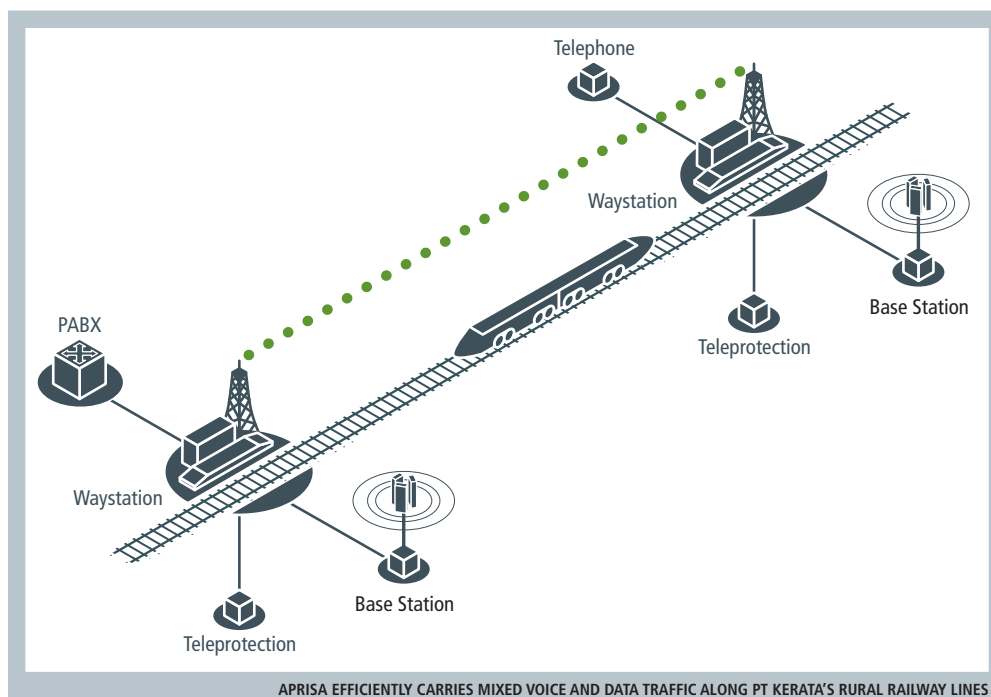
NETWORK DEPLOYMENT

Working with its local distributor and long-standing partner, PT Simoco Indonesia, 4RF prepared a business and technical case for implementing a network of Aprisa links to carry the required mix of voice and data traffic efficiently along PT Kereta's rural railway lines. An experienced team from 4RF advised on path engineering, frequency planning, and systems design and integration.

The licensed 1400 MHz frequency band was selected for PT Kereta's network. This band has the advantages of exclusive frequency assignment, the ability to support long links, often exceeding 100 kilometres, and resistance to interference from rain and other environmental conditions.

A monitored hot standby (MHSB) 1+1 configuration was chosen, providing equipment redundancy and protection against any single point of failure within the radio equipment to further increase network reliability, ideal for PT Kereta's network. The configuration comprised two standard Aprisa terminals connected by an Aprisa MHSB switch housed in a 1U chassis and controlled by a CPU monitoring the condition of the Aprisa radios and responding to a preset combination of alarm conditions that could indicate a failure in the radio equipment.

Along with 4RF and Simoco's turnkey implementation of the solution, PT Kereta was provided with user training to further support the smooth running of the network.

4RF's Aprisa provided the ideal solution for PT Kerata

INTERFACES USED

- E1
- 10Base-T Ethernet

TRAFFIC SUPPORTED

- PBX telephony
- Private Mobile Radio
- Data for control and ticketing

APRISA EFFICIENTLY CARRIES MIXED VOICE AND DATA TRAFFIC ALONG PT KERATA'S RURAL RAILWAY LINES

RESULTS

The use of the Aprisa, with its carrier-class performance and flexible interfaces, meant that PT Kereta could combine all its voice and data traffic efficiently into a common narrowband RF channel, resulting in operational efficiencies. Telephony traffic was supported with fractional E1 interfaces and multiplexers, and the data traffic was transmitted via 10Base-T Ethernet interfaces.

With 4RF's cost-effective Aprisa platform, PT Kereta has greatly enhanced the safety and reliability of its rail traffic management. Additionally, customer service in rural areas is improved through the provision of advanced ticketing and train information facilities.

Overall, safety and availability of personnel and information have greatly improved.

ABOUT 4RF

Operating in more than 130 countries, 4RF solutions are deployed by international aid organisations, public safety, military and security organisations, transport and utilities companies oil and gas companies, broadcasters, enterprises, and telecommunications operators.

All 4RF products are optimised for performance in harsh climates and difficult terrain, and support legacy analogue, serial data, PDH and IP applications.

4RF