Sydney M2 Tunnel Rebroadcast and Emergency Break In Comms Systems

RFI provided a communications solution to deliver a Break-In AM/FM rebroadcast (RRB) and Emergency Services radio coverage system as part of the Sydney Hills M2 tunnel upgrade.

OVERVIEW

Project: AM/FM radio and emergency services rebroadcast system, providing audio break-in capabilities, compatibility for the future DAB+ digital radio upgrade, and performance monitoring capability in the M2 Tunnel, NSW.

RFI Role: RFI fully managed the Communications project and provided a full turnkey solution of a radio rebroadcast system with audio message break-in including design, installation commission, training and documentation.

Job Overview: Provide the rebroadcast system, based on RFI experience and expertise with this technology. RFI delivered a flexible and feature-rich rebroadcast system including a full TCP/IP control interface to the customer’s OMCS, utilising a comprehensive suite of our products and services.

KEY COMPONENTS

- Rebroadcast AM Repeaters
- Rebroadcast FM Repeaters
- Broadband multi-carrier power amplifiers
- UHF O&M Two-Way Radio Rebroadcast
- Future compatibility for inclusion of DAB+ Rebroadcast
- Coaxial and Radiating Cable AM/FM/UHF rebroadcast system
- Audio Break-In Interface to the AM/FM Rebroadcast System
- Fully Integrated TIPIP DYNAC OMCS interface with dual NIC
- Fully digital Audio Server/Logger/Message Player
- PMCS System Alarm Monitoring interface

...And associated combining, antennas and related equipment
RFI was tasked with the design and installation of an upgrade to the M2 Tunnel intelligent transport system in NSW, Australia. The M2 Tunnel is one of Sydney’s primary transport routes, with busy vehicular traffic using the tunnel 24 hours a day, 7 days a week.

The AM/FM radio rebroadcast system is a relatively minor, but vital, component of the overall total intelligent transport system not only to maintain the rebroadcast of AM and FM radio stations within the Tunnel, but also to ensure that vital incident management capabilities can be maintained in the event of a sub-system failure.

An audio break-in capability allows prerecorded or live audio announcements to be inserted into the AM and FM rebroadcasts to notify drivers of incident information via their car radios.

PROJECT MANAGEMENT

RFI designed and installed the rebroadcast system, based on RFI’s experience and expertise with this technology. RFI delivered a flexible and feature-rich rebroadcast system, utilising a comprehensive suite of their products and services, including:

- The retransmission of the AM/FM broadcasts within the tunnel confines
- The retransmission of the existing Hills M2 Operations and Maintenance UHF two-way radio system to improve hand-held radio reception
- RFI undertook extensive software development to enable the interface from radio rebroadcast public address (RRBPA) Audio Server to communicate with the existing OMCS system via its custom WAN protocol.
- Also challenging was signal reception and rebroadcast of the AM/FM stations, due to the geographical location of the tunnel and the various output power of targeted AM/FM commercial broadcasters. RFI exercised thorough site surveys for optimal antenna placement to ensure strong signal reception and quality tunnel rebroadcasting to resolve these issues.
- RFI supplied all RRB hardware, software, cabinets, cables and antennas for both East and West Bound Tunnels, the MTP (Main Toll Plaza) and the EPCR (East Portal Control Room).