Hytera DMR Simulcast Solution Supports Faster and More Efficient Emergency Response in Istanbul



Introduction

The effectiveness of Istanbul's Disaster and Emergency Management Department (AFAD) was being hampered by the fact that its various units, such as fire, police and ambulance, all used independent conventional analog or DMR radio networks. It also only had access to limited radio frequencies. AFAD wanted to find a way to integrate all these existing networks into a single system with better coverage and improved dispatch functionality. Hytera supplied its DMR Tier III Simulcast Trunking Solution, HyTalk Pro platform, SmartOne dispatch system, along with multiple portable, mobile and fixed station DMR radios to deliver an integrated network supporting a more efficient emergency response.

The Background

The Disaster and Emergency Management Department (AFAD) is a governmental disaster management agency in Istanbul operating under the Turkish Ministry of Interior. It is responsible for the planning, direction and coordination of disaster management activities, such as earthquake

Project Name
Istanbul Seismic Risk Mitigation and Emergency Preparedness Project

Client Name
AFAD İstanbul İl Afet ve Acil Durum Müdürlüğü

Project Start/End Dates
2025-2026

Industry
Public Safety

Products/Solutions
DMR Tier III Simulcast Trunking Solution:
DMR DS-6211 Trunking Lite Base Stations with MSO
DMR HR659 Compact Repeater
DMR HP789 Handheld Radios
DMR HM789 Mobile and Fixed Station Radios
SmartOne Dispatch System
Multi-media Recording and Playback System (MRPS)
HyTalk Pro PoC System

response. It conducts search and rescue, humanitarian aid, evacuation and transfer operations worldwide, and establishes humanitarian infrastructure. However, it currently faces frequent operational issues due to its aging DMR conventional radio network equipment. Each department operates its own independent conventional network, which hampers interoperability and undermines the efficiency of disaster response and emergency management.



The Challenge

To address this, AFAD urgently needed to deploy an advanced DMR trunking radio system to enhance the effectiveness of its emergency communications. The key task was to find a way to interconnect all the independent conventional networks operated by various AFAD departments in Istanbul with a single, resilient and interoperable radio system in a cost effective way.

The project involved the deployment of a unified DMR trunking network using simulcast technology to make the most of the limited radio frequency resources available. This was a challenge in itself as it was the first time a DMR trunking simulcast system had been successfully deployed in Istanbul, making it an entirely new concept in terms of implementation. The job involved the deployment of 30 DMR base stations to ensure there was extensive signal coverage across the city.

The new radio network had to interface and integrate with diverse existing networks from multiple suppliers, including an analog radio system, a radio network operating on a dedicated frequency band, a conventional DMR system, and an HF air-band system.



The Solution

Hytera was chosen to provide the DMR Trunking Simulcast solution, in part because a previous attempt by other municipal departments in Istanbul to deploy a DMR trunking simulcast system from another vendor had failed to deliver stable simulcast functionality due to technical issues.

In simulcasting, multiple base stations transmit using the same modulation and frequency at the same time. Normally this would result in interference, but thanks to accurate synchronization of each base station transmission interference is avoided. This enables the system to operate like a single, large network. As the radios operate on a single frequency, users can roam seamlessly between base stations without having to change channels or radio settings.

The Benefits

Stable, Seamless, Frequency-Efficient Network
The Hytera DMR Simulcast Trunking solution succeeded in efficiently utilizing the limited frequency resources available to AFAD, while providing stable city-wide signal coverage. It was also able to seamlessly integrate the new Hytera equipment with the existing multi-vendor heterogeneous systems and devices.

Unified Network
SmartOne Dispatch system addressed AFAD's need for interoperability between the various conventional communication systems supplied by different vendors. The solution supports interconnection and unified voice dispatch across multiple voice communication systems and terminals.

Enhanced Emergency Response
The Hytera unified network solution ensures more efficient coordination between Istanbul's various emergency response units such as firefighting, medical services and municipal police during incidents and emergency situations.

Products

- DMR Tier III Simulcast Trunking Solution
- DMR DS-6211 Trunking Lite Base Stations with MSO
- DMR HR659 Compact Repeater
- DMR HP789 Handheld Radios
- DMR HM789 Mobile and Fixed Station Radios
- SmartOne Dispatch System
- Multi-media Recording and Playback System (MRPS)
- HyTalk Pro PoC System



Greater Dispatch Functionality

Hytera's solutions supports interconnection and unified voice dispatch across multiple voice communication systems and terminals, including PMR systems (digital, analog, conventional, trunking), Public Switched Telephone Network(PSTN). It also features visualized dispatch based on the map and real-time GPS location data.

Diverse Voice and Message Services

The DMR network supports individual calls, group calls, crosspatch, broadcast calls, priority calls, emergency calls, concurrent calls, call interruption, call overriding, call transfer, call alert, discreet listening and ambience listening, along with status and text messages.

Quality Radio Devices

The HP789 DMR portable radio offers loud, clear audio, a powerful battery, great portability and ruggedness (MIL-STD-810H and IP68 certified) for ease of use across multiple environments. The HM789 DMR mobile radios adapt to both vehicle and fixed control room scenarios and deliver clear audio even in noisy conditions.

Conclusion

Hytera's DMR Simulcast solution provided AFAD with a way to upgrade its communications while still being able to use its multiple existing networks, thereby continuing to extract benefit from its previous investments. The Simulcast solution maximised AFAD's limited RF holdings, while the HyTalk Pro platform and PUC integrated multiple networks and multi-vendor equipments into a single, seamless whole. This makes it much easier to coordinate the activities of different departments to deliver a more efficient response to any emergency situation.

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Hytera Communications Corporation Limited

Stock Code: 002583.SZ

Address: Hytera Tower, Hi-Tech Industrial Park North, 9108# Beihuan Road, Nanshan District, Shenzhen, P.R.C

Tel: +86-755-2697 2999 Fax: +86-755-8613 7139 Post: 518057
https: //www.hytera.com marketing@hytera.com

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