創新的網際協議無線電通訊系統先導計劃成效理想

The Innovative Internet Protocol (IP)-based Radio Communication System Pilot Scheme Gains Satisfactory Results

機電署致力為客戶提供創新而有效的技術方案。去年第三季，食物環境衞生署（食環署）委託我們為無線電通訊系統更換工作進行可行性研究。研究範圍包括擴大無線電覆蓋地區、應用便攜式無線電轉發器、設計多功能系統以達致通訊無阻、提高前線員工的工作效率、改善工作安全、加強資訊保安和提升系統可靠性。在今年4至8月的短短數月間，我們成功研發了新的技術方案，並在多個試點推行先導計劃，成效理想。與相類的工程方案相比，這個方案可大大減省推行時間和成本。

傳統的無線電轉發器大多設於山頂的發射站，由於受市區的高樓大廈阻擋，無線電覆蓋率因而大減。有見及此，機電署開發了新的網際協議無線電通訊系統。該系統利用現有流動電話網絡覆蓋率高達98%的優勢，在市區不同地點加裝固定的無線電轉發器，減省了在山上興建發射站的費用和時間。此外，我們更研發了便攜式無線電轉發器，其重量只有12公斤，可以迅捷地安裝於車輛或所到地點，通過流動電話網絡有效地擴大無線電覆蓋範圍。測試結果顯示，新系統能改善通訊盲點的情況，達致良好的通訊效果。

新系統還可加入多項新功能，例如緊急呼叫掣、倒地警告、免提通話、全球定位系統、透過電子地圖顯示位置（當緊急呼叫掣啟動時便會顯示）、短訊服務、數碼錄音、防止竊聽的語音加密功能，以及能防止無線電收發機資料外洩的遠端註銷功能等。此外，由於新系統同時連接兩個（最多可達四個）不同的流動電話網絡，即使個別流動電話網絡出現擠塞，通訊也不會受到影響。

新系統的發展潛力很大，可因應客戶未來需求而加入其他功能，包括擴展無線多媒體服務的應用範圍（例如隨身攝錄機）、收發和分析數據、取代有線傳輸，以及於鄉郊等難以到達的地點提供通訊及數據服務。

EMSD is committed to providing innovative and effective technical solutions to our clients. In the third quarter last year, the Food and Environmental Hygiene Department (FEHD) entrusted us to conduct a feasibility study on the replacement of its radio communication system. The scope of the study included expansion of radio coverage, use of portable radio repeaters, design of a feature-rich system for smooth communication, enhancement of work efficiency of frontline staff, improvement of work safety, and enhancement of information security and system reliability. Within the few months from April to August this year, we successfully developed a new technical solution and conducted a pilot programme at various locations. The results were satisfactory. Compared with other similar engineering solutions, this technical solution can significantly reduce time and costs.

Traditional radio repeaters are mostly installed at hilltop radio stations. Owing to blockage by high-rise buildings in urban areas, radio coverage is greatly reduced. In view of this, we pioneered a new IP-based radio communication system leveraging on the advantage of the high coverage (i.e. up to 98%) of the existing mobile phone networks. Fixed radio repeaters were retrofitted at different locations in urban areas in order to save the costs and time required for building hilltop radio stations. Besides, we also developed portable radio repeaters weighing only 12 kg each. As they can be quickly installed on vehicles or deployed to any locations, and are supported by mobile phone networks, radio coverage is effectively enhanced. Testing results showed that the system could alleviate radio blind spot problem and facilitate better quality communication.

Many new features can be introduced to the new system, including emergency call button, man-down warning, hot microphone, Global Positioning System, display of location via electronic map (when emergency call button is activated), Short Message Service, console voice logging, voice encryption for protection against eavesdropping, remote radio stun function for prevention of portable transceiver data leakage. In addition, as the new system is connected to two (maximum four) different mobile phone networks simultaneously, communication will not be interrupted even if one of the networks is congested.

The new system has great potential for further development in meeting our client's future needs, including expansion of wireless multimedia applications such as body-worn video cameras, data transmission and analysis, substitution of wired transmission, and provision of communication and data services to remote rural areas not easily accessible.