For discussion
on 6 May 2025

**Legislative Council Panel on Security**

**Replacement of Very High Frequency Radio Communication System for Maritime Rescue Coordination Centre of Marine Department**

## PURPOSE

The Very High Frequency (VHF) radio communication system of the Maritime Rescue Coordination Centre (MRCC) of Marine Department (MD) has been in use for more than 25 years, exceeding its normal service life. This paper consults Members on the replacement of the system and seeks Members' support for the submission of this funding proposal to the Finance Committee of the Legislative Council (the Finance Committee).

## BACKGROUND AND JUSTIFICATIONS

2. Security Bureau is responsible for formulating specific contingency plans for various emergencies. Among them is the "Contingency Plan for Maritime and Aeronautical Search and Rescue (SAR)". The Director of Marine is the designated Search Director for Hong Kong waters and Hong Kong's maritime Search and Rescue Region, and is responsible for handling all maritime SAR incidents in this area. The MRCC assists the Director of Marine in coordinating all maritime SAR operations.

3. At present, the MRCC uses the VHF radio communication system as the voice communication system for SAR operations. It provides a 24-hour distress signal communication service for all vessels, enables the MRCC to communicate in real-time with any vessel(s) in distress and effectively coordinates the SAR resources of different government departments within Hong Kong waters for conducting maritime SAR operations.

## LIMITATIONS OF THE EXISTING SYSTEM

4. The existing radio communication system was launched in 1999 and has been in use for more than 25 years. It uses a conventional two-way analogue radio system that operates in the VHF band, and has exceeded its normal service life. Due to the aging of the system, it now faces the following major challenges:

(a) The analogue radio communication technology used in the existing system has become obsolete and has been replaced by digital technology; and

(b) The majority of the equipment of the existing system has become obsolete and is being phased out. The relevant manufacturers have already discontinued support in relation to parts production and maintenance. Meanwhile, the maintenance of the system mainly relies on inventory of spare parts, and it is expected that the spare parts may be depleted within 3 years, jeopardising the normal maintenance of the system.

5. In order to ensure that the MRCC's radio communication system will continue to be underpinned by effective, reliable and secure radio communications to support the SAR operations, MD urgently needs to replace the existing system.

## THE PROPOSAL

6. Based on the above justifications, MD invited the Electrical and Mechanical Services Trading Fund (EMSTF) to conduct a feasibility study. With reference to the study results, MD recommends creating a new commitment of $25,000,000 for replacing the existing MRCC's radio communication system and upgrading the existing traditional analogue technologies to modern digital technologies.

**EXPECTED BENEFITS**

7. The feasibility study recommends the adoption of Radio over Internet Protocol (RoIP) technology[1]. The proposed technology will provide enhanced functions and better support for the SAR operations coordinated by the MRCC with the following expected benefits:

*(a) Stable signal reception*

As the new system is more spectrum-efficient, it shall offer improved audio quality and better immunity against interference. This enables the MRCC to receive a more stable signal, preventing signal issues from affecting the SAR operations;

*(b) Compatible with technologies adopted by equipment nowadays*

The new system has new features including integrated voice communication and record & replay functions, and supports external connection such as telephone system, allowing it to fully meet the daily operational needs of the MRCC. The new system will not only support seamless integration with the existing Vessel Traffic Services System (VTSS)[2] operated by the Vessel Traffic Centre (VTC) of MD, but also enable real-time monitoring of the integrity of the data communication over the IP network. This promotes the operational stability of the new system, thus more effectively supporting the collaborative maritime SAR operations by both centres; and

*(c) Enhance system security and reliability*

RoIP technology supports encrypted network transmission and storage by connecting multiple radio stations/repeaters and

[1] Radio over Internet Protocol (RoIP) is an Internet Protocol (IP) technology that employs IP to transmit and receive radio signals over the IP connected networks and devices. The merits of IP technology are flexible connection among multiple radio base stations, repeaters, and end-user devices without limitations of locations and usages.

[2] Vessel Traffic Services System (VTSS) is located at the Vessel Traffic Centre of MD. It provides vessel traffic monitoring services for vessels visiting Hong Kong and offers navigation advice to assist the visiting vessels in safely entering and exiting the port of Hong Kong.

consoles via an IP network, which ensures communication security. The new system also provides greater compatibility for additional security measures in the future.

## FINANCIAL IMPLICATIONS

Non-recurrent Expenditure

8. The proposed replacement of existing radio communication system of the MRCC shall involve an estimated non-recurrent expenditure of $25,000,000 from 2025-26 to 2028-29. A detailed breakdown and the anticipated cash flow are at **Annex**.

Recurrent Expenditure

9. The recurrent expenditure of the new system is estimated to be $2,000,000 per annum. This amount is largely similar to the recurrent expenditure of the existing system, which means the replacement of the system shall not incur additional annual recurrent expenditure. MD will bear the relevant recurrent expenditure with its existing resources.

## IMPLEMENTATION PLAN

10. Subject to Members' approval, we plan to seek funding approval from the Finance Committee in the second quarter of 2025 so that the relevant procurement procedures may commence in the third quarter of 2025. Full commissioning of the new system is targeted for the first quarter of 2028. The proposed schedule of implementation is as follows –

| Activity | Target Completion Date |
|---|---|
| Preparation of tender documents & tendering | Q3 2025 |
| Evaluation of proposals received & award of contract | Q1 2026 |
| Delivery and installation of system | Q3 2027 |
| User acceptance testing & training | Q4 2027 |
| Implementation of new system | Q1 2028 |

**ADVICE SOUGHT**

11. Members' views and support are sought on the above proposal. Subject to the support from the Panel on Security, we will submit the funding proposal to the Finance Committee.

**Security Bureau**
**Marine Department**
**May 2025**

**Annex**

## Non-recurrent Expenditure and Anticipated Cash Flow for Replacement of Very High Frequency (VHF) Radio Communication System for Maritime Rescue Coordination Centre (MRCC) of Marine Department

| | Item | 2025-26 ($'000) | 2026-27 ($'000) | 2027-28 ($'000) | 2028-29 ($'000) | Total ($'000) |
|---|---|---|---|---|---|---|
| (a) | Radio Base Station and Equipment | - | 5,600 | 2,800 | - | **8,400** |
| (b) | Integrated Voice Communication System and Record and Replay System | | 1,800 | 600 | - | **2,400** |
| (c) | Central Equipment and Operator Stations at MRCC | - | 3,100 | 1,700 | - | **4,800** |
| (d) | Operator Stations for Harbour Patrol Section | - | 500 | 100 | - | **600** |
| (e) | Installation/ Building Services | - | 1,400 | 600 | - | **2,000** |
| (f) | Acceptance Tests | - | 600 | 200 | - | **800** |
| (g) | Project Management | 1,200 | 845 | 845 | 1,110 | **4,000** |
| (h) | Contingency | - | - | 610 | 1,390 | **2,000** |
| | **Total** | **1,200** | **13,845** | **7,455** | **2,500** | **25,000** |

Notes:

Item (a): the estimated expenditure of $8,400,000 is for the procurement of 7 sets of radio base stations (including accessories) at 4 different remote hilltop sites.

Item (b): the estimated expenditure of $2,400,000 is for the procurement of integrated voice communication and record & replay systems, with integration of other existing voice communication channels.

Item (c): the estimated expenditure of $4,800,000 is for the procurement of central equipment, consoles and related equipment at the Main and Fallback MRCC.

Item (d): the estimated expenditure of $600,000 is for the procurement of consoles and related equipment at the Harbour Patrol Section.

Item (e): the estimated expenditure of $2,000,000 is for the setting up of system network, equipment installation, cabling works and any related building services works.

Item (f): the estimated expenditure of $800,000 is for the conduction of user acceptance testing of the new system.

Item (g): the estimated expenditure of $4,000,000 is for the payment to EMSTF for providing project management services, including preparation of tender documents, tender evaluation, the vetting of contractor's design submissions, the monitoring of contractor's installation, acceptance tests, and coordination work.

Item (h): the estimated expenditure of $2,000,000 represents about 8.7% contingency based on the items set out in paragraph items (a) to (g) above.