

For discussion
on 6 January 2009

Legislative Council Panel on Security

Replacement of Radio Communications System of the Correctional Services Department

PURPOSE

This paper seeks Members' support for the proposal to replace the existing analogue radio communications system of the Correctional Services Department (CSD) with a new digital system.

BACKGROUND

2. The radio communications system of CSD plays an important role in supporting the daily operations of penal institutions by providing an essential means of communication among officers on site. To maintain prison security and to ensure the safe custody of prisoners, a reliable and secure means of communication is necessary for the operation of the Department.

JUSTIFICATIONS

Need for replacement of the existing system

3. The existing radio communications system of CSD comprises an Ultra High Frequency (UHF) system and a Very High Frequency (VHF) system. The UHF system serves the communication needs of 5 penal institutions, while the remaining 19 institutions are covered by the VHF system. The two systems have been in use since 1992 and 1998 respectively and are approaching the end of their serviceable lives. Replacement is necessary.

4. A study conducted by the Electrical and Mechanical Services Department (EMSD) in 2007 on the existing radio communications system revealed the following problems –

- (a) Since the analogue technology is becoming obsolete, the system cannot be upgraded to cater for the future operational needs of CSD. It is also increasingly difficult to find spare parts for servicing the system;
- (b) As the existing system operates in the analogue mode, it is susceptible to interception and interference by other radio communications systems operating in adjacent frequency bands;
- (c) The UHF system is not compatible with the VHF system. When there is a need for communication between two institutions equipped with different communications systems, the messages are relayed through the institutional communication rooms by telephone or fax machine, etc, which increases the chance of interruption and delay;
- (d) Most CSD officers on site are required to take up patrol and escort duties, and the use of portable radio handsets is their sole means of communication. Due to the limited capacity of the existing system and heavy intra-institutional voice traffic, the voice channels are at times congested; and
- (e) Under the existing system, there are some radio blind spots and the radio coverage for some penal institutions located in remote areas is poor. In addition, the strong building structure (e.g. metal structure like gates and strong concrete walls) of the institutions gives rise to a shielding effect which makes it hard for radio frequency to be transmitted from one building to another.

The proposed radio system

5. In the light of the study findings, EMSD recommended CSD to replace the existing radio communications system with a new digital one.

The benefits of the proposed system are set out below –

- (a) The infrastructure of the proposed system will be built on open technological standards, allowing for further enhancement and development to meet changing operational needs;
- (b) The proposed system will offer improved voice quality and better protection against interference and interception;
- (c) The proposed system will cover all 24 penal institutions under CSD and enable more efficient communications among institutions;
- (d) The proposed system will make more efficient use of radio spectrum and have the capacity to provide more voice channels; and
- (e) The proposed system will be supported by additional transmission stations and repeaters, which will enhance both the reliability and coverage of CSD's communications system. In addition, the digital technology to be employed in the proposed system is able to reduce the impact of the shielding effect and improve indoor radio communication.

FINANCIAL IMPLICATIONS

Non-recurrent cost

6. We estimate that the total non-recurrent cost of the replacement system will be \$101.150 million over a four-year period from 2009-10 to 2012-13. A detailed breakdown is at **Annex A**.

Recurrent cost

7. The annual recurrent cost of the existing radio communications system is \$6.6 million, including maintenance charge, costs of consumables and spare equipment, and radio frequencies assignment and related services fee. The estimated recurrent cost of the proposed system is \$7.6 million in full year from 2014-15 onwards. The additional recurrent cost of \$1 million a

year is to cover the maintenance of the additional and more advanced radio equipment and accessories. A detailed breakdown is at **Annex B**. CSD will absorb the additional recurrent cost from within its existing resources.

IMPLEMENTATION PLAN

8. Subject to Members' comments on the proposal, we plan to seek funding approval from the Finance Committee in February 2009 with a view to implementing the proposed system by 2012. An implementation plan is at **Annex C**.

Security Bureau
Correctional Services Department
December 2008

Non-recurrent Cost of CSD's Proposed Radio Communications System

| | | 2009-10 \$'000 | 2010-11 \$'000 | 2011-12 \$'000 | 2012-13 \$'000 | Total \$'000 |
|-----|---------------------------------------------------------------------------------------------------------------------------|-------------------|-------------------|-------------------|-------------------|-----------------|
| (a) | Radio transceivers - (2 000 handsets and 150 radio desktop terminals) | | 400 | 7,100 | 21,590 | 29,090 |
| (b) | 28 base transmission stations & three radio repeaters – for improvement of radio coverage | | 700 | 8,200 | 19,190 | 28,090 |
| (c) | Network equipment (e.g. network management terminals, network maintenance terminals, etc) | | 1,200 | 9,200 | 11,410 | 21,810 |
| (d) | Initial spare equipment and consumables (e.g. radio terminals, audio gear, radio batteries, etc.) | | | | 790 | 790 |
| (e) | Engineering and other supporting services | | 200 | 200 | 100 | 500 |
| (f) | Contingency (10% of items (a) to (e) above) | | 250 | 2,470 | 5,305 | 8,025 |
| (g) | Project management services by EMSD (16% of the total non-recurrent cost of items (a) to (e) to be charged in four years) | 2,000 | 2,000 | 4,000 | 4,845 | 12,845 |
| | Total: | 2,000 | 4,750 | 31,170 | 63,230 | 101,150 |

Recurrent Cost of CSD's Proposed Radio Communications System

| | 2012-13 | 2013-14 | 2014-15 and onwards |
|------------------------------------------------------------------|------------------|---------------|---------------------------|
| | <u>\$'000</u> | <u>\$'000</u> | <u>\$'000</u> |
| <u>The Proposed System</u>¹ | | | |
| (a) Maintenance contract, consumables and spare equipment | 0 | 2,333 | 7,000 |
| (b) Radio frequencies assignment and related services fee | 600 ² | 600 | 600 |
| Sub-total: | 600 | 2,933 | 7,600 |
| <u>Less: Savings from the existing system</u>³ | | | |
| (a) Maintenance contract, consumables and spare equipment | | (2,000) | (6,000) |
| (b) Radio frequencies assignment and related services fee | | (150) | (600) |
| Sub-total: | | (2,150) | (6,600) |
| Total: | 600 | 783 | 1,000 |

¹ Free maintenance and spare parts warranty for the first year of system commissioning, i.e. from December 2012 to November 2013.

² Although the proposed system will only start commissioning in December 2012, a full-year charge of radio frequencies assignment and related services fee will be incurred for 2012-13 for system trial purpose since April 2012.

³ CSD will need to keep the existing system as a backup for a period of 12 months after the commissioning of the proposed system, i.e. from December 2012 to November 2013. Hence, no savings on recurrent cost can be identified for 2012-13.

**Implementation Plan for CSD's
Proposed Radio Communications System**

| Activity | Target Date |
|-------------------------------------------------------------------------------|--------------------------------|
| (a) System design / tender preparation | April 2009 – June 2009 |
| (b) Tendering and award of contract | July 2009 – December 2009 |
| (c) Approval of system design | January 2010 – February 2010 |
| (d) Equipment manufacture, delivery, installation & building service works | March 2010 – August 2012 |
| (e) Acceptance test and training (overall) | September 2012 – November 2012 |
| (f) System commissioning | December 2012 |