For discussion
on 3 March 2009

Legislative Council Panel on Security

Replacement of Radio Communications System of the Fire Services Department

PURPOSE

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

BACKGROUND

2. The radio communications system of FSD plays an important role in supporting the Department's territory-wide voice communication between the Fire Services Communications Centre at FSD Headquarters and frontline firemen and ambulancemen, as well as the direct voice communication among the frontline staff at the scene of incidents. A reliable radio communications system is essential for the efficient and effective operation of the Department.

JUSTIFICATIONS

Need for replacing the existing system

3. The existing radio communications system has been in use since 1997 and is reaching the end of its serviceable life. There is a need to replace the existing system due to the following factors –

(a) The analogue technology on which the existing system is based is becoming obsolete. It has become increasingly difficult to find suitable spare parts in the market for repair and maintenance;

(b) The outdating analogue technology also means that the existing system cannot be upgraded to cater for the operational needs of FSD in future. For instance, it is hard to find compatible repeaters in the market;

(c) The existing analogue system is susceptible to interception and interference by other radio communications systems operating in adjacent frequency bands; and

(d) Due to the limited capacity of the existing system and heavy voice traffic, the voice channels are at times congested at the scene of incidents.

4. To ensure that FSD's operation continues to be underpinned by effective, efficient and secure radio communication, it is necessary to acquire a new replacement system. Failure to do so may jeopardise the effectiveness of the provision of fire fighting and ambulance services in future.

The proposed radio communications system

5. The Electrical and Mechanical Services Department (EMSD) conducted a consultancy in July 2008 and recommended FSD to replace its existing radio communications system by a new digital system. The benefits of the proposed system include –

(a) The infrastructure of the proposed system will be based on open technological standards, ensuring interoperability among products by different manufacturers and thereby allowing greater flexibility in further enhancement and development to meet changing operational needs;

(b) The proposed system will be equipped with some 200 portable repeaters, which can be flexibly deployed inside buildings at the scene of incidents. The deployment of these repeaters will enhance both the reliability and coverage of indoor communication of FSD's communications system;

(c) The proposed system will offer improved voice quality and better protection against interference and interception by its new features, which include error correction, digital encoding, as well as random allocation of voice channels; and

(d) The proposed system will make more efficient use of the radio spectrum and has the capacity to provide more voice channels and increase the usable or effective airtime by about 100%.

6. The proposed system will be built upon FSD's existing wireless digital network (WDN), which is currently used to support data communication between the Fire Services Communications Centre and the fire appliances and ambulances. It is proposed that the WDN should be expanded to handle the voice traffic of the new radio communications system. EMSD advises that this is the most effective approach in terms of both cost and system development time.

FINANCIAL IMPLICATIONS

Non-recurrent cost

7. We estimate that the total non-recurrent cost of the replacement system will be $178.30 million over a three-year period from 2009-10 to 2011-12. A detailed breakdown is at **Annex A**.

Recurrent cost

8. The annual recurrent cost of the existing radio communications system is $8.22 million, including maintenance charge and radio frequencies assignment and related service fee. The estimated recurrent cost of the proposed system is $15.99 million in a full year from 2013-14 onwards. The additional annual recurrent cost of $7.77 million is to cover the maintenance of the additional equipment. A detailed breakdown is at **Annex B**. FSD will absorb the additional recurrent expenditure from within its existing resources.

IMPLEMENTATION PLAN

9. With Members' advice and comments, we will finalise the proposal and seek funding approval from the Finance Committee in April 2009 with a view to implementing the proposed system by 2011. A tentative implementation plan is at **Annex C.**

Security Bureau
Fire Services Department
February 2009

Annex A

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

Item	**Description**	**2009-10 $'000**	**2010-11 $'000**	**2011-12 $'000**	**Total $'000**
(a)	1 926 sets of portable transceiver, spare battery, charger and accessories	2,890	20,000	6,000	28,890
(b)	850 mobile transceivers for fire appliances, ambulances, fireboats and motorcycles	1,400	15,000	4,000	20,400
(c)	201 portable repeaters	2,050	6,000	2,000	10,050
(d)	Central equipment	800	9,000	3,000	12,800
(e)	Equipment and services for 12 new cell sites	1,400	8,000	3,000	12,400
(f)	MTRCL enhancement	3,000	30,000	9,000	42,000
(g)	Engineering services	1,670	7,620	3,910	13,200
(h)	Contingency (10% of the items (a) – (g) above)	1,320	9,560	3,090	13,970
(i)	Project management services by EMSD (16% of the total non-recurrent cost to be charged in 3 years)	12,590	6,000	6,000	24,590
	Total	**27,120**	**111,180**	**40,000**	**178,300**

Annex B

Recurrent Cost of FSD's Proposed Radio Communications System

	2011-12 $'000	2012-13 $'000	2013-14 and onwards $'000
The proposed system			
(a) Maintenance contract[1]	0	9,488	12,650
(b) Annual rental cost for 12 new cell sites	1,755	2,340	2,340
(c) Radio frequencies assignment and related services fee	750	1,000	1,000
Sub-total	**2,505**	**12,828**	**15,990**
Less: Savings from the existing system			
(a) Maintenance contract	(5,595)	(7,460)	(7,460)
(b) Radio frequencies assignment and related services fee	(570)	(760)	(760)
Sub-total	**(6,165)**	**(8,220)**	**(8,220)**
Total	**(3,660)**	**4,608**	**7,770**

[1] Free warranty for the first year of system commissioning, i.e. from July 2011 to June 2012.

Annex C

Implementation Plan for FSD's Proposed Radio Communication System

	Activity	Target Completion Date
(a)	System design / tender preparation	September 2009
(b)	Tendering and award of contract	March 2010
(c)	Approval of system design	June 2010
(d)	Equipment manufacture and delivery	November 2010
(e)	Equipment installation	April 2011
(f)	Acceptance test and training	June 2011
(g)	System commissioning	July 2011