

**For discussion
on 8 May 2009**

FCR(2009-10)12

ITEM FOR FINANCE COMMITTEE

CAPITAL WORKS RESERVE FUND HEAD 708 – CAPITAL SUBVENTIONS AND MAJOR SYSTEMS AND EQUIPMENT

Fire Services Department New Subhead “Replacement of Radio Communications System of the Fire Services Department”

Members are invited to approve a new commitment of \$178,300,000 for replacing the radio communications system of the Fire Services Department.

PROBLEM

The existing analogue radio communications system of the Fire Services Department (FSD) has been in use since 1997 and is approaching the end of its serviceable life. Failure to replace the system in a timely manner will jeopardise the daily operations of FSD in future.

PROPOSAL

2. The Director of Fire Services, on the advice of the Director of Electrical and Mechanical Services and with the support of the Secretary for Security, proposes to create a new commitment of \$178,300,000 to replace the existing analogue radio communications system of FSD with a new digital system.

/JUSTIFICATION

JUSTIFICATION

Need to Replace the Existing System

3. The existing radio communications system has been used for about 12 years and is reaching the end of its normal serviceable life. We need to replace the existing system for the following reasons –

- (a) the system's analogue technology is becoming obsolete. It has become increasingly difficult to find spare parts in the market;
- (b) due to its outdated analogue technology, the existing system cannot be upgraded to cater for the operational needs of FSD in future.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 susceptible to congestion at the scene of incidents.

The Proposed Radio Communications System

4. The Electrical and Mechanical Services Department (EMSD) completed a consultancy and recommended FSD to replace its existing radio communications system with a new digital system. The benefits of the proposed system include –

- (a) 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;
- (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)

- (c) the proposed system will offer better voice quality and 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%.

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

FINANCIAL IMPLICATIONS

Non-recurrent Expenditure

6. We estimate that the total non-recurrent expenditure of the replacement system will be \$178,300,000 with breakdown as follows –

	\$’000
(a) Portable transceivers	28,890
(b) Mobile transceivers	20,400
(c) Portable radio repeaters	10,050
(d) Central equipment	12,800
(e) Equipment and building services for new cell sites	12,400
(f) Enhancement of radio coverage along railway lines	42,000
(g) Engineering and other supporting services	13,200
(h) Contingency	13,970
(i) Electrical and Mechanical Services Trading Fund (EMSTF) project management services	24,590
Total	178,300

7. On paragraph 6(a) above, the estimate of \$28,890,000 is for the procurement of 1 926 sets of portable transceivers, including spare batteries, chargers and accessories, for use by fire and ambulance personnel during operations.

8. On paragraph 6(b) above, the estimate of \$20,400,000 is for the procurement of 850 mobile transceivers to be installed in fire appliances, ambulances, fireboats and motorcycles.

9. On paragraph 6(c) above, the estimate of \$10,050,000 is for the procurement of 201 portable radio repeaters to improve indoor radio coverage.

10. On paragraph 6(d) above, the estimate of \$12,800,000 is for the procurement of central equipment such as servers, digital switches, routers, digital exchange, communication interface and network equipment, etc..

11. On paragraph 6(e) above, the estimate of \$12,400,000 is for the procurement of 12 radio base stations, antennae, backup batteries, cabling and building services works for 12 new cell sites at hilltop and rooftop to improve coverage for portable transceivers.

12. On paragraph 6(f) above, the estimate of \$42,000,000 is for the enhancement of radio coverage at around 70 railway stations.

13. On paragraph 6(g) above, the estimate of \$13,200,000 is for engineering and other supporting services, including system design and installation, testing and commissioning, training and documentation by the contractor.

14. On paragraph 6(h) above, the estimate of \$13,970,000 represents a 10% contingency on the items set out in paragraphs 6(a) to (g) above.

15. On paragraph 6(i) above, the estimate of \$24,590,000 is for the payment to EMSTF for providing project management services, including preparation of tender documents, tender evaluation, approval of contractor's design submissions, monitoring of contractor's installation, acceptance tests, and co-ordination with various government departments and the contractor.

16. The estimated cash flow requirement for the proposed replacement is as follows –

Financial Year	\$'000
2009 - 10	27,120
2010 - 11	111,180
2011 - 12	40,000
Total	178,300

Recurrent Expenditure

17. We estimate that the recurrent expenditure of the replacement project is \$15,990,000 per annum from 2013-14 onwards, including expenses on maintenance, consumables, equipment spare parts, annual rental cost for 12 new cell sites and radio frequencies assignment and related services fee. This will be partly offset by the annual savings of \$8,220,000 from the existing radio system. A breakdown is as follows –

	2011 - 12	2012 - 13	2013 - 14 and onwards
	\$'000	\$'000	\$'000
The proposed system			
(a) Maintenance contract, consumables and spare parts ^{Note}	–	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			
(d) Maintenance contract, consumables and spare parts	(5,595)	(7,460)	(7,460)
(e) 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

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Note There will be a free maintenance and spare parts warranty for the first year after the commissioning of the proposed system, i.e. from July 2011 to June 2012.

18. On paragraph 17(a) above, the estimated annual expenditure of \$12,650,000 is for the maintenance service (including the costs of labour and materials for maintenance service for all equipment) and the procurement of consumables and equipment spare parts for the proposed system (including spare portable transceivers, radio batteries and antenna, etc.).

19. On paragraph 17(b) above, the estimated annual expenditure of \$2,340,000 is for the payment of rent, electricity charge, and leased telephone line rental of the 12 new cell sites.

20. On paragraph 17(c) above, the estimated annual expenditure of \$1,000,000 is for the radio frequencies assignment and related services fee for mobile radio transceivers, portable transceivers and portable radio repeaters.

21. The net increase of \$7,770,000 in recurrent expenditure from 2013-14 onwards is due to higher cost for the maintenance of additional and more advanced radio equipment and accessories of the proposed system, as well as the rental for new cell sites. FSD will absorb the additional recurrent expenditure from within its existing resources.

IMPLEMENTATION PLAN

22. We plan to implement the replacement project according to the following schedule –

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

PUBLIC CONSULTATION

23. We consulted the Legislative Council Panel on Security on the proposal on 3 March 2009. Members had no objection to the proposal.

BACKGROUND

24. The Finance Committee approved a commitment of \$69,500,000 in 1994 for FSD to replace its then radio communications system. The existing analogue radio communications system of FSD was commissioned on 1 September 1997. It plays an important role in supporting FSD's territory-wide voice communication between the FSCC at FSD Headquarters and frontline firemen and ambulancemen, as well as the direct voice communication among the frontline staff at scene of incidents. A reliable radio communications system is essential for the efficient and effective operation of FSD.

Security Bureau
April 2009