

ITEM FOR FINANCE COMMITTEE

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

Hong Kong Police Force

New Subhead "Replacement of the Marine Police Region radar surveillance system"

Members are invited to approve a commitment of \$16.5 million for the replacement of the radar surveillance system of the Marine Police Region.

PROBLEM

The existing radar surveillance system (RSS) of the Marine Region of the Hong Kong Police Force in its analogue format will not be able to receive data from the new digital vessel traffic services (VTS) system of the Marine Department upon the latter's commissioning in early 2003 and this will hamper the daily operation of Marine Police.

PROPOSAL

2. The Commissioner of Police (CP), on the advice of the Director of Marine and the Director of Electrical and Mechanical Services (DEMS), and with the support of the Secretary for Security, proposes to replace the existing analogue RSS with a digital system, to tie in with the replacement/upgrading of the VTS system.

JUSTIFICATION

3. The RSS provides real time operational and navigational data to Marine Police in maintaining law and order at sea. The radar coverage it provides is invaluable in facilitating Marine Police to prevent and take enforcement action against thefts from moored vessels by closely monitoring potential targets (e.g.

vessels carrying high-valued cargoes moored at known black spots), conduct marine traffic control during firework displays, co-ordinate search and rescue operations and monitor areas where security coverage is necessary. The long range radar capability helps establish the precise locations of intercepted vessels. The ability to track and monitor fast-moving vessels provides enormous support to Police launches in anti-smuggling and anti-illegal immigration operations. For example, since June this year, the Anti-smuggling Task Force has intercepted 12 smuggling speed boats including six "Tai Feis" carrying cars and two smuggling fishing vessels. Some of these interceptions would not have been possible without the help of a radar surveillance system. In addition, the system can record and provide print-outs of vessel positions and movements which are useful for future reference and for presentation as Court evidence.

4. The RSS obtains raw radar information from the VTS system of the Marine Department. At present, it can only receive data from eight analogue radar sites of the VTS system by means of fibre-optic lines. It is unable to receive digital signal from the ninth radar site which is a new site and is in digital format. The situation is currently remedied by reinforced patrolling of vessels in the area. CP considers it operationally necessary to enhance the radar coverage as the area concerned is a convenient route for smuggling and illegal immigration activities.

5. The VTS system will be upgraded to a digital system by the end of 2002 and become operational in early 2003. CP envisages it necessary to replace the RSS with a digital system concurrently so that Marine Police can continue to receive radar information from the VTS system and hence maintain their monitoring capability within the Hong Kong waters. If the existing RSS is not upgraded or replaced, the RSS would experience an interfacing problem with the new digital VTS system. Since there is no existing digital to analogue interface readily available in the commercial market capable of meeting the Police operational requirement, the existing analogue RSS could not function under the new digital VTS system. As a result, the Marine Police will completely lose the ability to monitor vessel movements in the waters of Hong Kong.

The digital RSS

6. In terms of coverage, the proposed digital RSS is fully compatible with the digital VTS system and can receive digital signals from all radar sites including the ninth radar site of the VTS system. Apart from this coverage enhancement, there will be an additional console which will enable separate tracking to be performed simultaneously. In addition to the multiple tracking of targeted vessels, the proposed digital RSS also provides advanced target extraction, tracking and labelling technology giving the operators a more accurate prediction of vessel movements. The open modular architecture, a feature of digital systems, also allows for later expansion of the system.

7. Whilst the RSS of the Marine Police Region is not part of the VTS system operated by Marine Department, we propose to include the RSS in the procurement exercise of the VTS system.¹ According to DEMS, this procurement approach has the following benefits -

- (a) bulk discount; and
- (b) savings in installation costs at remote radar sites.

DEMS advises that the project cost would be higher if we tender for the RSS alone due to the loss of the bulk discount and the additional cost involved in arranging for installation at the remote radar sites.

FINANCIAL IMPLICATIONS

Non-recurrent cost

8. We estimate that the non-recurrent cost of the digital RSS will be \$16.5 million, broken down as follows -

	Item	\$'000
(a)	Purchase, installation, testing and commissioning of the digital RSS	
	(i) Control room equipment	1,100
	(ii) Network equipment	930
	(iii) Remote radar sites equipment	1,520
	(iv) System software	3,850
	(v) Supporting services	5,620
	(vi) Installation of four data lines	30
	(vii) Minor electrical and building works	30
	Sub-total	13,080
(b)	Electrical and Mechanical Services Trading Fund (EMSTF) consultancy and project management fees	2,110
(c)	Contingency (10% of (a))	1,310
	Total	16,500

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¹ Although the RSS relies on the VTS system for raw radar data, the two systems are independent. They function in their own way to meet the different operational requirements of the Marine Department and the Marine Police.

9. As regards paragraph 8(a) above, the estimated cost of \$13,080,000 is to cover the hardware and software cost of the system, including three workstations with tracking hardware, specialised system and mapping software, recording and playback equipment and minor electrical and building works at the Marine Police Headquarters. Supporting services include engineering, installation of equipment, testing, commissioning, training and documentation. About half of the total cost for the supporting services will be used for the installation of equipment as huge cost will be incurred for the installation and transportation of equipment in remote sites which have to be accessed by helicopters. In addition, about 15% of the cost will be used to pay for the design of the system.

Encl. 10. As regards paragraph 8(b) above, the estimated cost of \$2,110,000 is to cover EMSTF consultancy and project management fees. A computation of the fees is at the Enclosure.

11. The estimated cashflow will be as follows -

	\$'000
2000-2001	6,600
2001-2002	6,600
2002-2003	3,300
Total	16,500

Recurrent cost

12. CP estimates that there will be a net saving of \$178,000 in the annual operating cost arising from the proposed system, broken down as follows -

	\$'000
(a) Hardware and software maintenance cost of the proposed system	1,300
(b) Rental of Digital Data Service (DDS) lines for the proposed system	312
<u>Less</u>	
(c) Recurrent cost of the existing analogue system	(1,790)
Saving	(178)

13. As regards paragraph 12(a) above, the estimated cost of \$1.3 million is to cover the annual maintenance cost of the hardware and software of the proposed system.

14. As regards paragraph 12(b) above, the estimated cost of \$312,000 is to cover the annual rental of the DDS lines for receiving radar data from the new VTS system (one high speed data link and three medium speed data links).

15. As regards paragraph 12(c) above, it is the annually recurrent maintenance cost of the existing system. The higher maintenance cost of the analogue system is mainly due to the higher rental of fibre-optic lines which will not be required for digital system.

16. As regards manning of the RSS, CP will deploy existing staff to operate the new RSS and no additional staff are required.

OTHER PROPOSALS CONSIDERED

17. We have considered the possibility of converting the digital data received from the new VTS system to data in analogue format for use by the existing RSS. The feedback we got from the industry is that there is no digital to analogue interface readily available in the commercial market capable of performing the vessel tracking function required by the Marine Police. Moreover, analogue systems are being phased out and the whole radar surveillance industry is moving towards digital processing and tracking technology.

Implementation Plan

18. CP plans to replace the RSS according to the following schedule to tie in with the upgrading of the VTS system -

	Target completion date
(a) Design and specification preparation	December 1999
(b) Tendering and awarding contract	May 2000
(c) Manufacturing, installation and testing	October 2001
(d) Acceptance of RSS control centre	December 2001
(e) Acceptance of equipment at remote sites	December 2002

/BACKGROUND

BACKGROUND INFORMATION

19. The existing RSS was planned in the early 1990's as part of the reprovisioning programme of the Marine Police Headquarters. It was based on the analogue technology prevailing at that time. The reprovisioning programme was approved by Finance Committee in April 1994 and the RSS commissioned in 1996-97. Its coverage and frequency format were then the same as the VTS system which only had eight analogue radar sites at that time.

20. The ninth radar site of the VTS system, which is in digital format, has been operational since November 1998. CP originally planned to upgrade partially the existing RSS to receive digital signal from the ninth radar site. A non-recurrent commitment of \$8.5 million was subsequently approved under delegated authority for the purpose. Meanwhile, as the existing VTS system is approaching the end of its estimated service life, the Director of Marine has commissioned DEMS to conduct a consultancy study on the long-term service capability of the VTS equipment. The study recommended that the existing VTS system be replaced. On 11 June 1999, the Finance Committee approved funding for the replacement/upgrading of the VTS system of the Marine Department to a digital system at a total commitment of \$226 million. The digital VTS system will come into operation in early 2003.

21. In view of the overall replacement programme of the VTS system, CP has reviewed the RSS requirements and having consulted DEMS, considers it more cost-effective to replace the existing RSS in analogue format with a digital one. We have not therefore proceeded with the original partial upgrading of the RSS. No expenditure has been incurred from the approved commitment of \$8.5 million.

Security Bureau
October 1999

**Calculation of the
Electrical and Mechanical Services Trading Fund (EMSTF)
Consultancy and Project Management Fees**

A. Project cost		\$13,050,000*
B. EMSTF consultancy and project management fees		
	Charging rate (%)	Charge (\$)
Project value		
On the first \$400,000	25.0	100,000
On the next \$1,600,000	20.0	320,000
On the next \$11,050,000	16.5	1,823,250
EMSTF (normal rate)		2,243,250
<u>Less</u> : Efficiency savings of EMSTF		(123,379)
	Total	2,119,871
	Say	2,110,000

*Cost breakdown at paragraph 8(a) (i) to (vi) of the agenda item.