

**For discussion  
on 14 May 2012**

**Legislative Council Panel on Health Services**

**Replacement of a Thermoluminescent Dosimetry System  
in the Department of Health**

**PURPOSE**

This paper seeks Members' support for our proposal to replace the existing Thermoluminescent Dosimetry System (TLD System) in the Department of Health (DH).

**BACKGROUND**

*The TLD System*

2. The TLD System is a device for monitoring the radiation dosages incurred by personnel engaged in work involving exposure to ionising radiation (including X-ray and gamma radiation). The System comprises three major components as follows —

- (a) the thermoluminescent dosimeters (TLDs), which are carried by the individuals for recording the radiation dosages received by them during work;
- (b) the TLD readers, which will process the TLDs by reading out the radiation dosage recorded in the TLDs and transfer the data to a dose analysis and record management system; and
- (c) the dose analysis and record management system, which will maintain the radiation dosage information of each monitored individual and will generate the dosage reports as necessary.

*Radiation Monitoring Services of DH*

3. At present, DH utilises a TLD System to provide the following radiation monitoring services in Hong Kong —

(a) Occupational Radiation Monitoring Service

DH provides a centralised personal radiation monitoring service to all radiation workers<sup>1</sup> in Hong Kong. The service includes the exchange, on a monthly basis, of radiation dosimeters to employers who subscribe to the service; the maintenance of the dosimeters; assessment of radiation dose recorded on the dosimeters which the workers carried in the previous month, reporting on the doses and alerting the employers in the event of high doses. The objective of the service is to provide the means to monitor the radiation exposure received by workers with a view to limiting their overall exposure to a reasonably acceptable level and within the limits prescribed by law<sup>2</sup>.

(b) Environmental Radiation Monitoring Service

Under its Environmental Radiation Monitoring Programme, the Hong Kong Observatory (HKO) monitors the long-term changes in environmental radiation levels in Hong Kong by placing TLDs in their monitoring stations. At the end of each monitoring cycle, HKO collects the TLDs and returns them to DH for analysis of the recorded radiation levels at corresponding monitoring stations. DH will then issue the dosage reports to HKO for analysis.

In addition, DH will also provide radiation monitoring service to emergency response workers who are assigned to take part in various nuclear and radiological contingency plans of the Government.

4. In 2011, DH provided services to 10 496 radiation workers for occupational radiation monitoring and 150 TLDs to HKO for environmental radiation monitoring in each monitoring cycle.

## **PROPOSAL**

5. We propose to replace the existing TLD System in DH which has reached the end of its economic serviceable life. The estimated cost is \$22 million.

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<sup>1</sup> Examples of these workers include medical doctors performing radiological interventional procedures on patients (e.g. cardiac related procedures), medical diagnostic radiographers taking X-ray radiographs on patients or performing nuclear medicine examinations on patients administered with unsealed radioactive substances, and industrial radiographers performing radiographic examinations on the integrity of solid structure and machinery using X-ray machines or radioactive sources.

<sup>2</sup> Under the Radiation Ordinance (Cap. 303), it is obligatory on the employers to monitor the radiation dosage received by their employees employed in radiation work or work involving the handling of unsealed radioactive substances.

## JUSTIFICATION

6. The Electrical and Mechanical Services Trading Fund (EMSTF) advises that the life expectancy of the existing TLD System is about ten years. The present system was commissioned by three phases in 1992, 1994 and 2001 respectively and has reached the end of its expected working life. The dose analysis and record management system, first commissioned in 1992, works on Microsoft Disk Operating System (DOS) environment and does not support report generation in Chinese. The system is becoming obsolete. Moreover, those components commissioned in the earlier phases have surpassed the normal economic serviceable life and spare parts are no longer available. Owing to ageing, the downtime has increased in recent years.

7. To ensure uninterrupted service to the users, we need to replace the existing TLD System in DH. The new TLD System will employ up-to-date technologies, including working on the latest computer operation environment and built-in radiation calibration capability so as to improve the accuracy of the monitoring results. Users will also have the option of receiving their radiation dosage reports in Chinese or English according to their preference.

## FINANCIAL IMPLICATIONS

### *Non-recurrent Expenditure*

8. The estimated non-recurrent cost of replacing the existing TLD System is \$22 million, broken down as follows –

	<b>\$ million</b>
(a) TLDs	5.90
(b) TLD readers	11.50
(c) Dose analysis and record management system	2.60
(d) Contingency (10% of (a) - (c) above)	2.00
<b>Total:</b>	<b><u>22.00</u></b>

9. The expenditure above is estimated to be incurred fully in 2012-13.

### *Recurrent Expenditure*

10. The replacement proposal will entail an additional annual recurrent expenditure of \$913,000, being the increase in EMSTF charges for maintenance of the new TLD System. DH will absorb the additional recurrent cost from within its existing resources.

## **IMPLEMENTATION PLAN**

11. We plan to seek funding approval from the Finance Committee (FC) within this legislative year for the proposed replacement of the TLD System with a view to commissioning the new system by March 2013. Subject to FC's approval, the implementation plan is as follows –

<b>Activity</b>	<b>Target completion date</b>
(a) Preparation of tender specifications	July 2012
(b) Invitation of tender	October 2012
(c) Tender evaluation and award of contract	December 2012
(d) System delivery, testing and commissioning	March 2013

## **ADVICE SOUGHT**

12. Members are invited to support our proposal to replace the existing TLD System in DH.

Food and Health Bureau  
May 2012