For discussion
on 14 May 2012

Legislative Council Panel on Health Services

Replacement of a Standard Radiological Dosimetry Calibration Facility in the Department of Health

PURPOSE

This paper seeks Members' support for our proposal to replace the existing Standard Radiological Dosimetry Calibration Facility (RDCF) in the Department of Health (DH).

BACKGROUND

2. The RDCF is for calibration of radiation dosimetry instruments which are used for the measurement of ionising radiation (including X-ray and gamma radiation) dosage. In order to conform to the standards prescribed by the International Organisation for Standardisation (ISO) on radiation dosimetry, the accuracy of the RDCF has been regularly calibrated directly against national primary dosimetry reference standards. The RDCF is therefore the reference standard for radiation dosimetry in Hong Kong. Through calibration against the RDCF, the accuracy of local radiation dosimetry instruments can be verified. This is fundamental to the protection of workers who are engaged in work involving exposure to ionising radiation.

3. In 2011, DH conducted 28 cases of calibration, of which 17 cases were conducted on instruments held for regulatory purposes by the Radiation Board of Hong Kong, two cases on DH's own dosimeters related to provision of radiation monitoring services, another six cases on instruments held by other Government departments or public hospitals, and three cases of calibration for local calibration service providers. The dosimetry instruments calibrated by DH may serve as tertiary reference standards to check the accuracy of other operational radiation dosimetry instruments for field measurements in Hong Kong.

PROPOSAL

4. We propose to replace the existing RDCF in DH which has reached the end of its economic serviceable life. The estimated cost is $15.5 million.

JUSTIFICATION

5. The Electrical and Mechanical Services Trading Fund (EMSTF) advises that the life expectancy of the existing RDCF is about ten years. The existing facility was commissioned in 2001 and has reached the end of its expected working life. The manufacturer of a major component of the RDCF has closed its business, putting the availability of spare parts and maintenance support at risk.

6. DH needs to replace the existing RDCF as soon as possible to ensure uninterrupted service to the users. The replacement of the facility will also bring about the following benefits –

(a) Increased productivity on calibration

The new RDCF will be equipped with an additional calibration track for separate calibration against X-ray and gamma radiation fields. This will shorten the preparation time for dosimeter calibration and increase the calibration throughput.

(b) Expanded reference energy calibration points

The ISO specifies a series of radiation energy as reference points for checking the accuracy of radiation dosimeters. The existing RDCF, apart from having a high stability X-ray machine that provides a range of narrow spectrum X-ray reference energies, is equipped with only one radioactive source providing one gamma energy reference point. The new RDCF will be equipped with two additional gamma energy reference points with an expanded range of gamma energies for calibration of gamma dosimetry instruments, hence providing calibration that is more reliable over a wider energy range.

(c) Improved radiation safety

In the existing RDCF, the entrance door to the facility is interlocked with the X-ray machine of the facility so that X-ray will be stopped when the entrance door is inadvertently opened. However, there is no such interlock installed for the radioactive source irradiator in the existing facility. In the new RDCF, the radioactive sources irradiator will be equipped with this safety device to prevent accidental gamma radiation exposure once the entrance door is opened. This is an important improvement on occupational health and safety protection of the calibration staff and other workers.

FINANCIAL IMPLICATIONS

Non-recurrent Expenditure

7. The estimated non-recurrent cost of replacing the existing RDCF is $15.5 million, broken down as follows –

		$ million
(a)	New RDCF, comprising –	
	(i) One set of radioactive sources irradiator with control system	1.3
	(ii) One set of X-ray machine for irradiation with control system	3.7
	(iii) Two sets of calibration track	5.5
(b)	Installation of necessary radiation protection facilities[1] in the premises hosting the new RDCF	3.6
(c)	Contingency (10% of (a) and (b) above)	1.4
	Total:	**15.5**

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

Recurrent Expenditure

9. The replacement proposal will entail an additional annual recurrent expenditure of $889,000, being the increase in EMSTF charges for maintenance of the new RDCF. DH will absorb the additional recurrent cost from within its existing resources.

IMPLEMENTATION PLAN

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

[1] These include radiation shielding facility, surveillance system and exposure interlock system.

	Activity	Target completion date
(a)	Preparation of tender specifications	July 2012
(b)	Invitation of tender	November 2012
(c)	Installation of radiation protection facilities for the premises hosting the new RDCF	November 2012
(d)	Tender evaluation and award of contract	December 2012
(e)	System delivery, testing and commissioning	March 2013

ADVICE SOUGHT

11. Members are invited to support our proposal to replace the existing RDCF in DH.

Food and Health Bureau
May 2012