

## **ITEM FOR FINANCE COMMITTEE**

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

#### **Hong Kong Observatory**

#### **New Subhead “Replacement of the Storm Detecting Weather Radar at Tate’s Cairn”**

Members are invited to approve a new commitment of \$36 million for the replacement of a storm detecting weather radar at Tate’s Cairn.

### **PROBLEM**

The storm detecting weather radar at Tate’s Cairn needs to be replaced in good time to sustain the weather forecast and warning services relating to severe weather.

### **PROPOSAL**

2. The Director of Hong Kong Observatory, with the support of the Secretary for Commerce and Economic Development, proposes to create a new commitment of \$36 million to replace the ageing storm detecting weather radar at Tate’s Cairn.

### **JUSTIFICATION**

#### **Importance of the Radar**

3. The Hong Kong Observatory (HKO) operates meteorological facilities to provide weather forecasts and issue warnings to the general public, including those relating to severe weather. This helps reduce loss of life and damage to property, and minimise disruption to economic and social activities during hazardous weather.

4. HKO operates two storm detecting weather radars. Housed in stations located at remote hilltops at Tate's Cairn and Tai Mo Shan, these two radars have been in use since 1994 and 1999 respectively.

5. The primary function of the two radars is to monitor rain and wind associated with severe weather. They help detect and estimate the intensity and location of rain up to 500 kilometres from Hong Kong. They also generate information which is particularly useful for tracking the movement and strength of tropical cyclones. The two radars normally work in tandem to ensure the quality of the weather data collected.

6. The information gathered by the radars is crucial to HKO for providing timely weather forecasts and, more importantly, the related warnings such as signals alerting the public of tropical cyclone, thunderstorm, rainstorm, flooding and landslide.

7. At times when one of the radars is not serviceable due to reasons such as maintenance or repair, HKO relies on the other radar to maintain its service (which becomes mission critical when severe weather is approaching/affecting Hong Kong).

### **Need for Replacement**

8. The present radar at Tate's Cairn is approaching the end of its useful life. Its annual unserviceable time is growing<sup>Note</sup>, and maintenance work has become increasingly difficult as many spare parts are already out of production.

9. HKO has adopted various measures to lengthen the life of the radar. They include regular preventive maintenance, searching for more spare part providers, and putting the radar on "standby" mode during fine weather to reduce its wear and tear. Despite so, we estimate that the radar may not be able to function properly by end 2014.

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<sup>Note</sup> The average annual unserviceable time of the radar at Tate's Cairn has increased from 35 hours for the period of 2007 to 2008 to 73 hours for the period of 2009 to 2010.

10. HKO proposes to procure a replacement radar for commissioning in 2014. We need to start the process now to allow lead time for tendering, station improvement works, system installation and test-runs.

11. HKO has been operating weather radars for over 50 years. It has put in place effective safeguard measures in accordance with international standards to ensure radiation safety. In drawing up the tender specifications for the replacement radar at Tate's Cairn, HKO will ensure that the replacement radar fully meets the relevant safety requirements.

### **Anticipated Benefits**

12. The proposed replacement of the radar at Tate's Cairn would enable HKO to sustain the present forecast and warning services relating to severe weather. Paired use of the replacement radar with the other radar at Tai Mo Shan would help ensure the quality of the weather data collected.

13. In replacing the ageing radar, HKO proposes to secure a radar with "dual-polarisation" feature after taking into consideration factors including cost-effectiveness. Equipped with the new feature, the proposed replacement radar will offer enhanced capability for estimating actual rainfall amount. This would enable HKO to make better rainfall forecast for the next hour or so. Such a model is becoming more widely used in other economies, including Mainland China, Japan, South Korea and Singapore.

## **FINANCIAL IMPLICATIONS**

### **Non-recurrent Expenditure**

14. We estimate that the proposal would require a non-recurrent provision of \$36 million to cover the cost of the replacement radar and related installation. The expenditure is expected to be spent over a four-year period from 2012-13 to 2015-16, with breakdown as follows –

/2012-13 .....

	<b>2012-13 \$ million</b>	<b>2013-14 \$ million</b>	<b>2014-15 \$ million</b>	<b>2015-16 \$ million</b>	<b>Total \$ million</b>
(a) Hardware (including initial spare parts, consumables and test equipment)	3.78	3.77	15.10	2.52	25.17
(b) Software	0.65	0.65	2.58	0.43	4.31
(c) Delivery, installation, testing, commissioning, documentation and training	0.49	0.49	1.96	0.33	3.27
<i>Sub-total</i>	<i>4.92</i>	<i>4.91</i>	<i>19.64</i>	<i>3.28</i>	<i>32.75</i>
(d) Contingency	0.48	0.49	1.96	0.32	3.25
<b>Total</b>	<b>5.40</b>	<b>5.40</b>	<b>21.60</b>	<b>3.60</b>	<b>36.00</b>

15. On paragraph 14 (a) to (c), the estimate of \$32.75 million will cover the cost of the replacement radar and related installation, training, testing and related expenses.

16. On paragraph 14 (d), the estimate of \$3.25 million represents a 10% contingency on the items set out in paragraphs 14 (a) to (c).

### **Other Non-recurrent Cost**

17. About \$12.4 million will be needed for improvement works to the station at Tate's Cairn, which involves demolition and construction of part of the station building. It will be funded from the relevant block grant of the Architectural Services Department under the Capital Works Reserve Fund.

### **Recurrent Expenditure**

18. We estimate that the proposal will entail an annual recurrent expenditure of \$1,326,000 upon full implementation in 2014-15, with breakdown as follows –

	2011-12 \$'000	2012-13 \$'000	2013-14 \$'000	2014-15 and onwards \$'000
(a) Light and power	9	175	175	175
(b) Communication lines	-	-	158	158
(c) Spare parts and consumables	-	-	-	982
(d) Maintenance of station building	-	-	-	11
<b>Total</b>	<b>9</b>	<b>175</b>	<b>333</b>	<b>1,326</b>

19. The estimated recurrent expenditure for the replacement radar is higher than that for the existing one, at \$0.5 million in 2010-11. This is mainly due to (a) the higher estimated cost of the replacement radar; and (b) the relatively low base at present, due to reducing availability of spare parts for the existing radar.

20. HKO will absorb the additional recurrent expenditure from within its existing resources.

## IMPLEMENTATION PLAN

21. We plan to implement the proposal according to the following schedule -

Activity	Target completion date
(a) Tender preparation and invitation	December 2011
(b) Contract award	May 2012
(c) Station improvement works	August 2013
(d) Delivery and installation	November 2013
(e) Acceptance test	January 2014
(f) System commissioning	May 2014

22. During the installation of the replacement radar, the existing radar will be dismantled and HKO will rely on the other storm detecting weather radar at Tai Mo Shan to maintain its services. To minimise any possible impact on the related services, HKO will carry out the installation works in the autumn/winter months when the weather is normally fine, i.e. the fourth quarter of 2013. HKO will also work closely with the contractor to compress the duration of such works to about 1 to 2 months. We plan to commission the replacement radar before the rainy season of 2014.

### **PUBLIC CONSULTATION**

23. The Administration consulted the Legislative Council Panel on Economic Development on 23 May 2011. Members supported the proposal.

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Commerce and Economic Development Bureau  
June 2011