

For discussion
on 23 May 2011

Legislative Council Panel on Economic Development

Proposal to Replace the Storm Detecting Weather Radar at Tate's Cairn

PURPOSE

This paper briefs members on a funding proposal from the Hong Kong Observatory ("HKO") to replace an ageing storm detecting weather radar at Tate's Cairn, for the purpose of sustaining the effective monitoring of severe weather affecting Hong Kong.

BACKGROUND

2. As the meteorological authority in Hong Kong, 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.
3. The storm detecting weather radar is a vital piece of equipment for monitoring tropical cyclones, rainstorms and other severe weather conditions such as thunderstorms and hails. The information gathered by the radar 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, flood and landslip.
4. At present, HKO operates two storm detecting weather radars. Housed in stations located at remote hilltops at Tate's Cairn (please see [Annex A](#)) and Tai Mo Shan, these two radars have been in use since 1994 and 1999 respectively.

5. The primary functions of the two radars lie in helping HKO 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 a tropical cyclone. The two radars would normally work in tandem. That helps ensure the quality of the weather data collected.

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

PROPOSAL

7. The Director of HKO, with the support of the Secretary for Commerce and Economic Development, proposes to replace the ageing weather radar at Tate's Cairn.

JUSTIFICATION

8. The present radar at Tate's Cairn is approaching the end of its useful life. Its annual unserviceable time has been increasing in recent years¹. Maintenance work has become increasingly difficult as many spare parts are already out of production. We estimate that the radar may not be able to function properly by end 2014.

9. Timely replacement of the radar at Tate's Cairn is essential for sustaining the forecast and warning services relating to severe weather.

10. In replacing the ageing equipment, we propose to secure a model with the latest technologies after taking into consideration factors including cost-effectiveness. We would procure a radar with "dual-polarisation" feature. A radar equipped with this feature will be able to provide additional information measuring rain intensity to improve the estimation of the actual

¹ The average annual unserviceable time of the present radar has increased from 35 hours for the period of 2007 to 2008 to 73 hours for the period of 2009 to 2010.

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, Korea and Singapore.

11. HKO plans to put the new radar in operation in 2014. Taking into account the lead time for invitation of tender, station improvement works, system installation and test-runs, we need to seek funding approval from the Legislative Council now.

12. HKO has been operating weather radars for over fifty 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 new radar fully meets our safety requirements.

FINANCIAL IMPLICATIONS

Non-recurrent Expenditure

13. We estimate that the proposal would require a non-recurrent provision of \$36 million to cover the cost of the radar and related installation etc. The expenditure is expected to be spent over a four-year period from 2012-13 to 2015-16. A detailed breakdown is at **Annex B**.

14. Besides, we estimate that about \$12.4 million is needed for station improvement works, which involves demolition and construction of part of the station building. This required amount is being separately sought from the relevant block grant of the Architectural Services Department under the Capital Works Reserve Fund.

Recurrent Expenditure

15. We estimate that the proposal would necessitate a recurrent provision of about \$1.33 million per annum upon full implementation in 2014-15. This includes expenditure for procurement of spares and consumables, payment of light and power, rental for communication links, and maintenance of the station building. The estimated total expense is higher than the latest recurrent expenditure of the existing radar, at \$0.5 million in 2010-11. This is mainly due to two factors : (a) the higher

cost of the new equipment; and (b) the relatively low base at present, due to reducing availability of spare parts for the existing radar.

16. The total recurrent expenditure will be absorbed by HKO from within its existing resources. A detailed breakdown is at **Annex C**.

WAY FORWARD

17. Subject to members' views, we intend to put the funding proposal to the Finance Committee in June 2011 for approval.

Commerce and Economic Development Bureau
Hong Kong Observatory
May 2011

Annex A

**Existing Storm Detecting Weather Radar of the Hong Kong Observatory
at Tate's Cairn**



Annex B

**Estimated Non-recurrent Expenditure for
the Proposed Replacement of the Storm Detecting Weather Radar
at Tate's Cairn**

		2012- 13	2013- 14	2014- 15	2015- 16	Total
		\$ million	\$ million	\$ million	\$ million	\$ million
(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
	Contingency (10 % of (a)+(b)+(c))	0.48	0.49	1.96	0.32	3.25
	Total	5.40	5.40	21.60	3.60	36.00

**Estimated Annual Recurrent Expenditure
for the Proposed Replacement Storm Detecting Weather Radar
at Tate's Cairn**

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