

## Head 168 — HONG KONG OBSERVATORY

**Controlling officer:** the Director of the Hong Kong Observatory will account for expenditure under this Head.

**Estimate 2014–15** ..... **\$259.8m**

**Establishment ceiling 2014–15** (notional annual mid-point salary value) representing an estimated 296 non-directorate posts as at 31 March 2014 and as at 31 March 2015..... **\$139.3m**

In addition, there will be an estimated five directorate posts as at 31 March 2014 and as at 31 March 2015.

### Controlling Officer's Report

#### Programmes

<b>Programme (1) Weather Services</b>	This programme contributes to Policy Area 7: Public Safety (Secretary for Commerce and Economic Development).
<b>Programme (2) Radiation Monitoring and Assessment</b>	This programme contributes to Policy Area 9: Internal Security (Secretary for Security).
<b>Programme (3) Time Standard and Geophysical Services</b>	This programme contributes to Policy Area 7: Public Safety (Secretary for Commerce and Economic Development).

#### Detail

##### Programme (1): Weather Services

	2012–13 (Actual)	2013–14 (Original)	2013–14 (Revised)	2014–15 (Estimate)
Financial provision (\$m)	202.5	210.9	210.7 (–0.1%)	<b>222.7</b> (+5.7%)
				(or +5.6% on 2013–14 Original)

#### *Aim*

**2** The aim is to provide weather forecasts and issue warnings to the public, special users, the shipping community and aviation groups in order to reduce loss of life and damage to property, and minimise disruption to economic and social activities during hazardous weather.

#### *Brief Description*

**3** The Central Forecasting Office and Airport Meteorological Office of the Hong Kong Observatory (HKO) are responsible for the preparation and issue of weather information, forecasts and various warnings on hazardous weather to the public, the shipping community and aviation groups. HKO also promotes public awareness of, and community preparedness for, natural disasters. This work involves:

- operating a network of mostly automated weather stations;
- carrying out real-time exchange of data with meteorological centres in the world;
- receiving meteorological satellite imageries, and operating weather radar systems and other meteorological instruments;
- analysing meteorological data and computing the future weather by numerical modelling;
- disseminating weather information by a diversity of means;
- issuing warnings on hazardous weather such as tropical cyclones, storm surges, rainstorms, landslips, flooding, thunderstorms, windshear, fire danger and extreme hot and cold conditions; and
- conducting public talks, interviews and training courses as well as producing educational materials on hazardous weather phenomena.

**4** In 2013, HKO fulfilled its performance pledge of issuing at least one bulletin every hour of the day, disseminating 99 per cent of the bulletins within ten minutes after each hour, and attained a forecast accuracy (as verified by objective means) of 90 per cent. To handle the increasing volume of data collected locally and from other meteorological centres, HKO's computing infrastructure was being enhanced to increase data storage and processing capability.

5 Weather information was enhanced in 2013 to meet the needs of the public through:

- providing a personalised weather homepage allowing user customisation to increase efficiency in the access of weather and other information;
- launching a new regional weather webpage based on the Geographical Information System platform, integrating different types of weather information on the same map;
- enhancing the tropical cyclone track information on HKO website with satellite images and track accuracy zone, and advancing the provision of the track information by two hours for distant tropical cyclones;
- launching an automatic regional weather forecast website using output from computer weather models, displaying seven-day forecasts at selected stations and probability forecast of rain or no rain over Hong Kong;
- enriching the mobile weather application “MyObservatory” with new features such as “My Weather Report”, aviation weather information and automatic notification of “Special Weather Tips”;
- enhancing the Weather Wizard, a software gadget running on personal computer for delivering weather information automatically, to incorporate weather forecasts and a range of popular HKO services; and
- expanding the network of webcams to include weather photos at Sai Wan Ho.

6 HKO maintains a close surveillance of the weather at and around the Hong Kong International Airport (HKIA) and provides the aviation community with the weather information needed for its operations. In 2013, HKO continued to provide a suite of significant convection forecast products to the Civil Aviation Department (CAD) to facilitate runway and airspace capacity estimation. In addition, short-term forecast of significant convection are uplinked to aircraft via CAD. Meanwhile, the Airport Thunderstorm and Lightning Alert System was enhanced to provide location-specific alerts to minimize the impact of lightning on airport operation. Further progress was made in replacing and upgrading meteorological facilities for HKIA to enhance aviation weather services. A new generation aviation weather information dissemination system and a new mobile application dedicated to airlines and pilots were launched. New meteorological information systems for interfacing with CAD’s new air traffic control systems were under trial. A station is being constructed to house a new windshear radar.

7 Other items of note for 2013 include:

- signing a letter of intent with the Institute of Atmospheric Physics, Chinese Academy of Sciences to further the collaboration in meteorology, climate and extreme weather research;
- launching the “MyWorldWeather” application on the Android mobile platform and enhancing the application with eight languages in addition to English to provide authoritative weather forecasts and climatological information to mobile users around the globe;
- issuing satellite analysis reports on tropical cyclones for reference by meteorological services worldwide and launching the “Tropical Cyclone Forecaster Website” to provide weather forecasters with a comprehensive source of useful information on operational tropical cyclone forecasting;
- launching a pilot project through a regional collaboration initiative to provide community numerical weather models to developing countries in Asia for capacity building in the use and interpretation of models and forecasts;
- launching a new HKO mascot to help promote public education activities and updating the vision, mission and values of HKO to set out future directions, objectives and development strategies in the coming decade and beyond, with a set of core values linked by the word “SCIENCE”- Serve, Care, Innovate, Enthuse, Nurture, Collaborate and Excel;
- expanding the Community Weather Information Network (Co-WIN), operated in collaboration with the Hong Kong Polytechnic University, with a membership of over 130 and extending coverage to places such as Guam and the Philippines;
- promoting weather education through the “Community Weather Observing Scheme”, an initiative of Co-WIN through the sharing of weather observations on mobile and social networking platforms;
- installing automatic weather stations for the first time on two Voluntary Observing Ships, thereby enabling hourly observations of weather parameters to be collected for processing and dissemination to other meteorological services around the world;
- launching a free public TV weather service, through which weather programmes, including a weekly educational feature named “Cool Met Stuff”, produced in-house by HKO were broadcast on TV, YouTube and the “MyObservatory” mobile application;
- conducting talks and lectures for the public and government bureaux/departments as well as the education, transport and other sectors to promote awareness of and community preparedness for natural disasters; and
- organising the “Under the Same Sky 130 Years” joint exhibition with the Hong Kong Museum of History in celebration of HKO 130<sup>th</sup> anniversary, with a total of 146 882 visitors during the eight-week event.

8 The key performance measures in respect of weather services are:

**Targets**

	Target	2012 (Actual)	2013 (Actual)	2014 (Plan)
forecasts perceived as accurate by the public (%) <sup>α</sup> .....	78	79	75	<b>78</b>
accurate public forecasts as verified by objective means (%).....	88	89	90	<b>90</b>
accurate forecasts as assessed by ship captains (%).....	96	99	98	<b>96</b>
accurate forecasts as assessed by airline operators (%).....	96	99	100	<b>98</b>
hourly local weather reports disseminated within the first ten minutes of each hour (%).....	99	99	99	<b>99</b>

<sup>α</sup> The survey results in 2013 were lower probably owing to the more changeable weather that adversely affected the forecast scores around the periods when the public opinion surveys were conducted.

**Indicators**

	2012 (Actual)	2013 (Actual)	2014 (Estimate)
calls answered by Dial-a-Weather system (million)#.....	18.3	15.7	<b>15.5</b>
telephone enquiries answered manually#.....	28 500	24 688	<b>24 500</b>
visits to HKO website (million) <sup>^</sup> .....	30 028	65 672	<b>70 000</b>
companies and organisations subscribing to special weather and warning services.....	112	111	<b>111</b>
total revenue from above subscribers (\$m) <sup>δ</sup> .....	1.3	1.1	<b>0.8</b>
media interviews and public lectures/talks on weather.....	1 195	1 241	<b>1 200</b>
meteorological documents for flights departing Hong Kong.....	181 000	190 000	<b>196 000</b>
visits to aviation weather information system (million) <sup>@</sup> .....	50.5	63.5	<b>71.0</b>

# The actual figures may vary depending on whether there are more weather changes of concern to the public in that particular year.

<sup>^</sup> Figures include visits to HKO's websites including PDA and mobile websites, the Weather Wizard and mobile application. The notable increase in 2013 was primarily attributable to the growth in users getting access to weather information through mobile devices and other websites.

<sup>δ</sup> The decrease in 2014 estimated figure is due to the expiry of contracts with individual TV stations following the launch of free TV weather services open to all with effect from 30 December 2013.

<sup>@</sup> The increase in 2013 was primarily attributable to the utilisation of the new forecast products to support air traffic management during inclement weather.

**Matters Requiring Special Attention in 2014–15**

9 During 2014–15, HKO will:

- continue to upgrade its TV studio facilities in support of the new TV weather services;
- enhance media weather services to meet the rising needs of the media and the public;
- continue to enrich the contents of its website in response to the evolving needs of the public and to further develop the delivery of weather services through mobile and social networking platforms;
- enrich the content of the “Digital Weather Forecast” service taking advantage of the latest technological advancement;
- continue to enhance its weather service to the public, aviation and marine community and to develop new products making use of up-to-date meteorological techniques;
- install replacement computing facilities to support the enhancement of nowcasting service;
- enhance the computing network gateways of HKO to improve security, efficiency, reliability and compatibility in data communication with external systems in support of HKO's mission-critical services;
- commission the replacement weather radar at Tate's Cairn for monitoring severe weather;
- continue to enhance the automatic weather station network to provide more weather information;

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- commission a meteorological profile measuring system installed on the new government fixed-wing aircraft for collection of airborne meteorological data to enhance the monitoring and forecasting of tropical cyclones;
- continue to promote public awareness of, and preparedness for, natural disasters through various outreach activities and continuous development of educational resources;
- continue to take forward the replacement and upgrading of meteorological facilities for the airport to enhance its aviation weather services, including the installation of a new radar for windshear detection near Brothers Point and putting it into operational use;
- acquire a new Light Detection and Ranging system to replace the ageing system at the south runway at HKIA; and
- conduct an initial study of the windshear condition of the proposed third runway of the HKIA.

### Programme (2): Radiation Monitoring and Assessment

	2012–13 (Actual)	2013–14 (Original)	2013–14 (Revised)	<b>2014–15 (Estimate)</b>
Financial provision (\$m)	24.9	25.8	26.1 (+1.2%)	<b>26.1</b> (—)
				(or +1.2% on 2013–14 Original)

#### *Aim*

**10** The aim is to provide information on environmental radiation levels in Hong Kong and advise government departments on the protective action that may be necessary during nuclear emergencies.

#### *Brief Description*

**11** HKO monitors ambient radiation levels in Hong Kong and conducts radiological measurements on air, soil, water and food samples. In the event of a nuclear emergency, HKO will notify and advise government departments on the possible consequences in Hong Kong and recommend protective action. HKO organises training and exercises on radiation monitoring for other government departments involved in the Hong Kong contingency plan for nuclear emergencies. The work involves:

- operating a network of radiation monitoring stations, an aerial radiation monitoring system, a radiological survey vehicle, a radiation laboratory and an emergency radiation data management system;
- keeping abreast of the latest development on the methodology for nuclear accident consequence assessment; and
- planning and participating in exercises and drills in response to nuclear emergencies.

**12** In 2013, all radiation monitoring and assessment work in this programme was carried out satisfactorily. All equipment was maintained in a state of readiness, highlighted by the successful re-certification audit under ISO 9001:2008. Inter-comparisons between Hong Kong and Guangdong on radiological measurements continued. Exercises, drills and training on radiation monitoring and assessment were conducted.

**13** The key performance measures in respect of radiation monitoring and assessment are:

#### *Target*

	Target	2012 (Actual)	2013 (Actual)	<b>2014 (Plan)</b>
data availability of radiation monitoring network (%).....	99.0	99.5	99.8	<b>99.5</b>

#### *Indicators*

	2012 (Actual)	2013 (Actual)	<b>2014 (Estimate)</b>
exercises and drills§ .....	25	18	<b>18</b>
visits to HKO's webpage on radiation .....	1 734 025	1 465 510	<b>1 600 000</b>

§ The high number of exercises and drills in 2012 was primarily attributable to preparation for the large-scale government-wide Daya Bay Contingency Plan (DBCP) exercise in late April 2012.

***Matters Requiring Special Attention in 2014–15***

**14** During 2014–15, HKO will:

- continue to implement the agreed arrangements between Hong Kong and Guangdong on radiation monitoring and assessment;
- continue to conduct drills and exercises on emergency response in conjunction with other government departments as well as the relevant Guangdong counterparts;
- continue to organise training on radiation monitoring and assessment; and
- continue to take forward the enhancement of radiation monitoring and assessment facilities, taking into account outcomes from the DBCP exercise.

**Programme (3): Time Standard and Geophysical Services**

	2012–13 (Actual)	2013–14 (Original)	2013–14 (Revised)	<b>2014–15 (Estimate)</b>
Financial provision (\$m)	11.7	10.7	11.0 (+2.8%)	<b>11.0</b> (—)
				(or +2.8% on 2013–14 Original)

***Aim***

**15** The aim is to maintain the Hong Kong time standard and to provide geophysical, oceanographic, astronomical and climatological information to the public.

***Brief Description***

**16** HKO maintains the Hong Kong time standard and provides time signals for the public. It prepares, collates, provides and publicises geophysical, oceanographic, astronomical and climatological information for the public and to meet the requirements for planning, engineering design and environmental impact assessments. It monitors earthquakes and the sea-level and releases related information to the public, including the operation of the tsunami warning system. It also keeps abreast of research and development on international issues such as global climate change and advises the public and government departments on likely implications. This work involves:

- maintaining a caesium beam clock as the Hong Kong time standard and providing time signals for radio broadcasts, automatic telephone answering service and synchronisation of clocks via the Internet;
- carrying out real-time exchange of seismic data with overseas centres and disseminating earthquake information by various means;
- operating seismological, tide and water level monitoring networks and conducting related analyses;
- compiling climatological and other related data;
- conducting studies on climate change in Hong Kong and promoting public understanding; and
- providing updates on the effects of El Nino and other longer term atmospheric phenomena on Hong Kong.

**17** In 2013, the objectives and targets of this programme were generally met. Achievements and activities include:

- launching on Twitter the provision of earthquake information for earthquakes worldwide of magnitude 5.0 or above, in addition to the Quick Earthquake Message service for earthquakes worldwide of magnitude 6.0 or above;
- exchanging real time data with the Earthquake Administration of Guangdong Province to enhance the capability of detecting earthquakes in Guangdong and nearby areas;
- participating in the Pacific-wide Tsunami Exercise “PacWave13” organised by the Intergovernmental Oceanographic Commission;
- continuing to contribute to the International Bureau of Weights and Measures for the determination of the universal standard time;
- providing input to the latest assessment by the Intergovernmental Panel on Climate Change (IPCC), and studying the effect of climate change, such as the projection of temperature trends for Hong Kong; and
- developing and applying the Standardized Precipitation Index to assess the severity of historical drought conditions in Hong Kong and conducting studies on topics relating to water resource management.

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18 The key performance measures in respect of time standard and geophysical services are:

### *Targets*

	Target	2012 (Actual)	2013 (Actual)	<b>2014 (Plan)</b>
time standard accuracy (microseconds per day).....	0.1	0.1	0.1	<b>0.1</b>
geophysical, meteorological and oceanographic data capture rate (%) .....	98	100	100	<b>99</b>
climatological information (% of written requests responded to within ten working days) .....	99	100	100	<b>100</b>

### *Indicators*

	2012 (Actual)	2013 (Actual)	<b>2014 (Estimate)</b>
visits to HKO's Internet time service (million) $\Omega$ .....	4 712	10 003	<b>14 000</b>
requests for geophysical, climatological and oceanographic information and advice $\Delta$ .....	972	1 005	<b>1 000</b>

$\Omega$  The notable increase in 2013 was primarily attributable to the general increase in the use of networked computing equipment in the community and the increasing publicity and popularity of the service. The increasing trend in the visits to HKO's Internet time service is expected to continue in 2014.

$\Delta$  The actual figures may vary depending on whether there are relevant events of concern to the public in that particular year.

### *Matters Requiring Special Attention in 2014–15*

19 During 2014–15, HKO will:

- continue to provide climate information and data to users efficiently and enhance the climate information webpage for more user-friendly access;
- continue to study as well as to promote public understanding of climate change impact on Hong Kong, especially in the light of IPCC's latest assessment; and
- continue to keep abreast of storm surge, earthquake and tsunami risk assessment in the region.

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### ANALYSIS OF FINANCIAL PROVISION

	2012-13 (Actual) (\$m)	2013-14 (Original) (\$m)	2013-14 (Revised) (\$m)	2014-15 (Estimate) (\$m)
<b>Programme</b>				
(1) Weather Services.....	202.5	210.9	210.7	222.7
(2) Radiation Monitoring and Assessment.....	24.9	25.8	26.1	26.1
(3) Time Standard and Geophysical Services .....	11.7	10.7	11.0	11.0
	239.1	247.4	247.8 (+0.2%)	259.8 (+4.8%)
				(or +5.0% on 2013-14 Original)

#### Analysis of Financial and Staffing Provision

##### Programme (1)

Provision for 2014-15 is \$12.0 million (5.7%) higher than the revised estimate for 2013-14. This is mainly due to the increased requirement for repair and upgrade of facilities, Civil Service Provident Fund contribution, and filling of vacant posts.

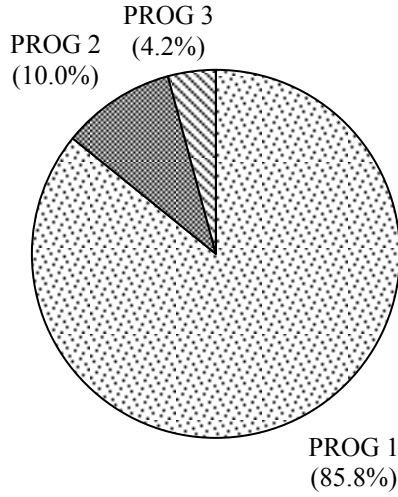
##### Programme (2)

Provision for 2014-15 is the same as the revised estimate for 2013-14.

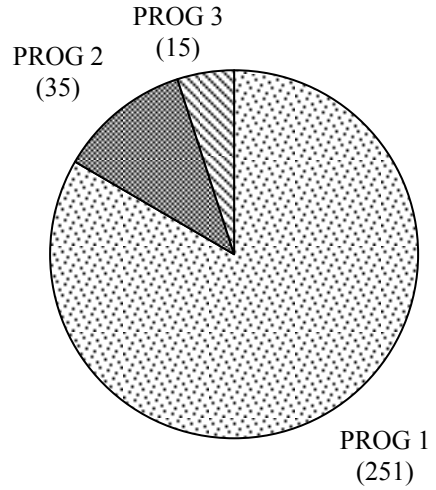
##### Programme (3)

Provision for 2014-15 is the same as the revised estimate for 2013-14.

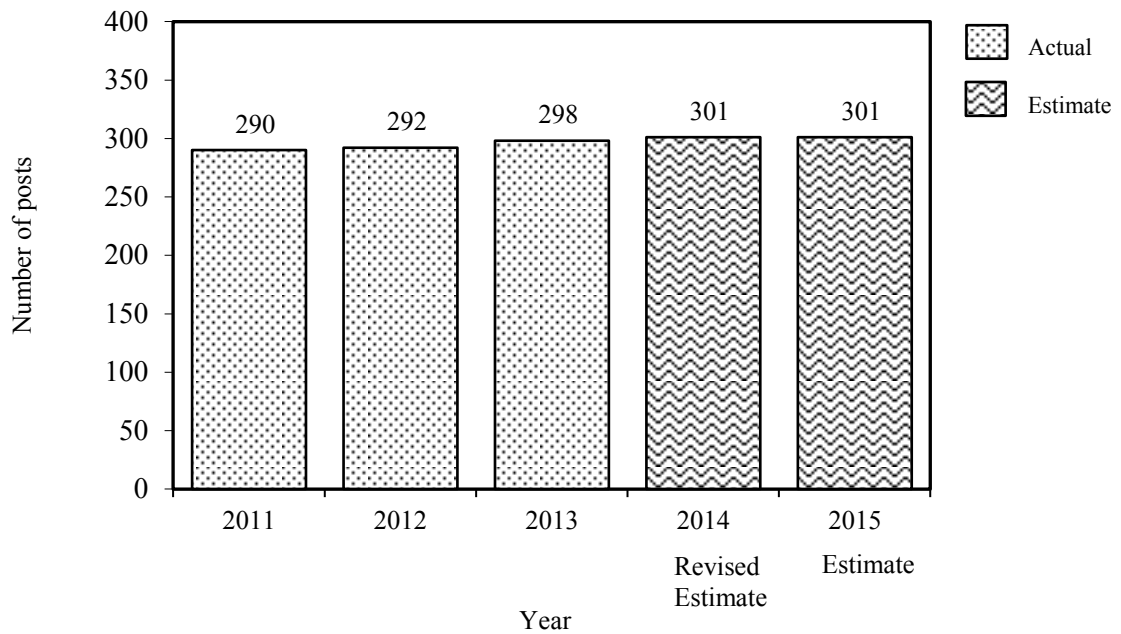
*Allocation of provision to programmes (2014-15)*



*Staff by programme (as at 31 March 2015)*



*Changes in the size of the establishment (as at 31 March)*





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Sub-head (Code)	Actual expenditure 2012–13	Approved estimate 2013–14	Revised estimate 2013–14	<b>Estimate 2014–15</b>	
	\$'000	\$'000	\$'000	<b>\$'000</b>	
<b>Operating Account</b>					
Recurrent					
000	Operational expenses .....	234,691	247,367	247,827	<b>259,781</b>
	Total, Recurrent.....	234,691	247,367	247,827	<b>259,781</b>
	Total, Operating Account .....	234,691	247,367	247,827	<b>259,781</b>
<b>Capital Account</b>					
Plant, Equipment and Works					
	Minor plant, vehicles and equipment (block vote).....	4,412	—	—	—
	Total, Plant, Equipment and Works.....	4,412	—	—	—
	Total, Capital Account.....	4,412	—	—	—
	Total Expenditure .....	239,103	247,367	247,827	<b>259,781</b>

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### Details of Expenditure by Subhead

The estimate of the amount required in 2014–15 for the salaries and expenses of the Hong Kong Observatory is \$259,781,000. This represents an increase of \$11,954,000 over the revised estimate for 2013–14 and of \$20,678,000 over actual expenditure in 2012–13.

#### *Operating Account*

#### Recurrent

**2** Provision of \$259,781,000 under *Subhead 000 Operational expenses* is for the salaries, allowances and other operating expenses of the Hong Kong Observatory.

**3** The establishment as at 31 March 2014 will be 301 permanent posts. No change in establishment is expected in 2014–15. Subject to certain conditions, the controlling officer may under delegated power create or delete non-directorate posts during 2014–15, but the notional annual mid-point salary value of all such posts must not exceed \$139,274,000.

**4** An analysis of the financial provision under *Subhead 000 Operational expenses* is as follows:

	2012–13 (Actual) (\$'000)	2013–14 (Original) (\$'000)	2013–14 (Revised) (\$'000)	<b>2014–15 (Estimate) (\$'000)</b>
Personal Emoluments				
- Salaries.....	153,067	160,459	160,459	<b>163,239</b>
- Allowances.....	1,620	1,705	1,953	<b>1,553</b>
- Job-related allowances.....	381	164	380	<b>380</b>
Personnel Related Expenses				
- Mandatory Provident Fund contribution.....	347	402	366	<b>372</b>
- Civil Service Provident Fund contribution.....	1,822	2,604	2,636	<b>3,309</b>
Departmental Expenses				
- General departmental expenses .....	77,350	81,918	81,918	<b>90,813</b>
Other Charges				
- World Meteorological Organization.....	104	115	115	<b>115</b>
	234,691	247,367	247,827	<b>259,781</b>