

Head 168 — HONG KONG OBSERVATORY

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

Estimate 2015–16 **\$275.5m**

Establishment ceiling 2015–16 (notional annual mid-point salary value) representing an estimated 296 non-directorate posts as at 31 March 2015 rising by seven posts to 303 posts as at 31 March 2016..... **\$151.7m**

In addition, there will be an estimated five directorate posts as at 31 March 2015 and as at 31 March 2016.

Controlling Officer's Report

Programmes

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

Detail

Programme (1): Weather Services

	2013–14 (Actual)	2014–15 (Original)	2014–15 (Revised)	2015–16 (Estimate)
Financial provision (\$m)	209.5	222.7	229.9 (+3.2%)	236.9 (+3.0%)
				(or +6.4% on 2014–15 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 issuance 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. The 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 2014–15, 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 91 per cent. HKO's computing infrastructure was enhanced to increase data storage and processing capability to handle increasing volume of data collected locally and from other meteorological centres, and to generate new and enhanced services and products.

5 Weather information was enhanced in 2014–15 to meet the needs of the public through:

- enhancing weather forecasting service by extending the forecast period from seven days to nine days, with the “Automatic Regional Weather Forecast” also similarly extended;
- revamping nine-day weather forecast webpage to display the temperature and humidity forecasts in graphical format to facilitate at-a-glance viewing and easy comparison with normal climatological ranges;
- providing new service on Hot Weather Special Advisory to raise public awareness of the impact of hot weather and launching a trial Hong Kong Heat Index on HKO website for monitoring hot weather conditions;
- enhancing the tropical cyclone track information on HKO website with radar images and more frequent updates of the track information for distant tropical cyclones;
- enriching the mobile weather application “MyObservatory” with new features such as marine forecast, earthquake information and enhanced content for “Special Weather Tips”;
- extending the “MyObservatory” application to one more smartphone platform;
- launching weather information service on one new social media platform; and
- enriching regional weather information on HKO website to include weather photos at Lamma Island and temperatures at Kai Tak Runway Park.

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 2014–15, HKO continued to provide a suite of significant convection forecast products to the Civil Aviation Department (CAD) on a trial basis to facilitate runway and airspace capacity estimation. In addition, short-term forecasts of significant convection were uplinked to aircraft via CAD to increase pilots’ situation awareness. Meanwhile, HKO continued to collaborate with the Airport Authority Hong Kong to improve the Airport Thunderstorm and Lightning Alert System for minimising the impact of lightning on airport operation. The new windshear radar station for airport surveillance at Brothers Point was commissioned in late 2014. An initial study of the windshear condition of the proposed third runway of the HKIA was also conducted.

7 Other noteworthy items for 2014–15 include:

- signing a co-operation agreement with Guangdong Meteorological Bureau to enhance collaboration in meteorological science and technology;
- completing the replacement of computing facilities to support the enhancement of nowcasting service, with the update frequency of the “Rainfall nowcast for the Pearl River Delta Region” website increased from once every 30 minutes to once every 12 minutes;
- revamping and enhancing “My Little Observatory” and “Educational Resources” webpages for public education purposes;
- enhancing the regional weather webpage on the Geographic Information System (GIS) platform with more weather elements and functionalities;
- expanding the Community Weather Information Network (Co-WIN), operated in collaboration with the Hong Kong Polytechnic University, with a membership of over 140 including two overseas members in Guam and the Philippines;
- promoting weather education through the “Community Weather Observing Scheme”, an initiative of Co-WIN through the sharing of weather observations and photos on website, mobile and social networking platforms;
- launching the “Weather Information for the Marine Community” webpage as a portal for weather information and forecasts as well as other information of interest in support of operations of the marine community;
- organising a number of educational events and outreach activities engaging youths and students through Co-WIN and Science in Public Service, including the Weather Observation and Weather Photos Competition 2014, “Weather Chit Chat with the Director” and various scientific talks;
- supporting Hongkong Post in the launch of a set of special stamps and first day covers entitled “Weather Phenomena”;
- launching and broadcasting a new TV documentary series “Meteorology Series IV”, jointly produced with Radio Television Hong Kong;
- launching a web-based platform for viewing the “Under the Same Sky 130 Year” exhibits previously on display at the Hong Kong Museum of History during the summer of 2013;
- collecting weather photos from members of the public via social media for producing HKO Calendar 2015;
- conducting talks and lectures for the public, government bureaux/departments as well as the education, transport and other sectors to promote awareness of and community preparedness for natural disasters and climate change;

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- launching a revamped website for the World Weather Information Service (WWIS) under the auspices of the World Meteorological Organization to provide global authoritative weather forecasts and climatological information; and
 - launching the Data Collection or Production Centre for WWIS to provide online services for other meteorological services to search and access the official weather forecasts and climatological information for cities around the world.
- 8 The key performance measures in respect of weather services are:

Targets

	Target	2013 (Actual)	2014 (Actual)	2015 (Plan)
forecasts perceived as accurate by the public (%).....	78	75	77	78
accurate public forecasts as verified by objective means (%).....	88	90	91	90
accurate forecasts as assessed by ship captains (%).....	96	98	97	96
accurate forecasts as assessed by airline operators (%).....	96	100	98	98
hourly local weather reports disseminated within the first ten minutes of each hour (%).....	99	99	99	99

Indicators

	2013 (Actual)	2014 (Actual)	2015 (Estimate)
calls answered by Dial-a-Weather system (million)#.....	15.7	12.3	12.0
telephone enquiries answered manually#.....	24 688	21 345	22 000
visits to HKO website (million)^.....	65 672	72 522	75 000
companies and organisations subscribing to special weather and warning services.....	111	111	111
total revenue from the above subscribers (\$m)δ.....	1.1	0.7	0.7
media interviews and public lectures/talks on weather#.....	1 241	1 163	1 200
meteorological documents for flights departing Hong Kong.....	190 000	198 000	201 000
visits to aviation weather information system (million)@.....	63.5	84.3	95.0

- # The actual figures may vary depending on whether there are more weather changes of concern to the public in that particular year.
- ^ Figures measured in page views comprising the number of access to HKO's websites including PDA and mobile websites, the Weather Wizard and mobile application.
- δ The decrease in 2014 and 2015 is due to the expiry of contracts with individual TV stations following the launch of free TV weather services with effect from 30 December 2013.
- @ The increase in 2014 was primarily attributable to the utilisation of the new forecast products to support air traffic management during inclement weather. The increasing trend is expected to continue in 2015.

Matters Requiring Special Attention in 2015–16

- 9 During 2015–16, HKO will:
- provide state-of-sky forecasts on the “Automatic Regional Weather Forecast” website;
 - launch a one-stop service hub on HKO website integrating essential weather information on a GIS platform;
 - enhance the “Digital Weather Forecast” service for the Pearl River Delta region by extending the forecast range from three days to nine days;
 - enhance media weather services to meet the rising needs of the media and the public, and upgrade TV weather graphics system for the production of TV weather programmes;
 - launch new Announcements in the Public Interest to raise public awareness of thunderstorms and swell hazards generated by distant tropical cyclones;
 - continue to enrich the contents of the “MyObservatory” application;
 - 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 a new government fixed-wing aircraft for collection of meteorological data to enhance the monitoring and forecasting of tropical cyclones;
- further develop and promote outreach and public educational activities to increase the society's awareness of and preparedness for natural disasters and climate change;
- continue to take forward the replacement and upgrading of meteorological facilities for the airport to enhance its aviation weather services, including commissioning of the new meteorological information systems for interfacing with CAD's new air traffic control systems;
- acquire new Light Detection and Ranging systems to replace the ageing systems at the runways at HKIA; and
- acquire a short-range Light Detection and Ranging system to detect and alert building-induced turbulence at HKIA.

Programme (2): Radiation Monitoring and Assessment

	2013–14 (Actual)	2014–15 (Original)	2014–15 (Revised)	2015–16 (Estimate)
Financial provision (\$m)	25.6	26.1	27.2 (+4.2%)	27.2 (—)
				(or +4.2% on 2014–15 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 2014–15, 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. A replacement emergency radiation data management system was put into operation. Additional radiation monitoring equipment and enhanced communication facilities were being implemented for enhancing emergency preparedness and response capability.

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

Target

	Target	2013 (Actual)	2014 (Actual)	2015 (Plan)
data availability of radiation monitoring network (%)	99.0	99.8	99.7	99.5

Indicators

	2013 (Actual)	2014 (Actual)	2015 (Estimate)
exercises and drills	18	19	19
visits to HKO's webpage on radiation	1 465 510	1 625 073	1 600 000

Matters Requiring Special Attention in 2015–16

14 During 2015–16, 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 Daya Bay Contingency Plan exercise.

Programme (3): Time Standard and Geophysical Services

	2013–14 (Actual)	2014–15 (Original)	2014–15 (Revised)	2015–16 (Estimate)
Financial provision (\$m)	10.7	11.0	11.4 (+3.6%)	11.4 (—)
				(or +3.6% on 2014–15 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 the likely implications. The 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 2014–15, the objectives and targets of this programme were generally met. Achievements and activities include:

- continuing to contribute to the International Bureau of Weights and Measures for the determination of the universal standard time;
- launching the “Weather Information for Astronomical Observation” webpage for trial operation in collaboration with the Hong Kong Space Museum and the Department of Physics of the University of Hong Kong to provide weather information for popular astronomical observation locations in Hong Kong and general astronomical information for stargazers to make plans for observation activities;
- conducting a joint webcast with the Hong Kong Space Museum, the Ho Koon Nature Education cum Astronomical Centre and the Po Leung Kuk Ngan Po Ling College Observatory for the total lunar eclipse on 8 October;
- studying the latest assessment by the Intergovernmental Panel on Climate Change (IPCC) and the potential impact of climate change projections on Hong Kong;
- providing weather and climate information to the utility sector in support of energy-saving measures and services; and
- conducting studies on topics related to monsoon rainfall, tropical cyclone activities and wind climate in Hong Kong.

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

Targets

	Target	2013 (Actual)	2014 (Actual)	2015 (Plan)
time standard accuracy (microseconds per day)	0.1	0.1	0.1	0.1
geophysical, meteorological and oceanographic data capture rate (%)	99 β	100	100	100
climatological information (% of written requests responded to within ten working days)	99	100	100	100

β The target is revised from 98 per cent to 99 per cent as from 2015 with enhanced reliability of the telecommunication network.

Indicators

	2013 (Actual)	2014 (Actual)	2015 (Estimate)
visits to HKO's Internet time service (million).....	10 003	10 306	10 000
requests for geophysical, climatological and oceanographic information and advice Δ	1 005	798	800

Δ 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 2015–16

19 During 2015–16, HKO will:

- continue to engage various stakeholders in promoting the effective use of climate information and to develop climate-related services in support of the business needs of different sectors;
- 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 maintain the Hong Kong time standard and to keep abreast of storm surge, earthquake and tsunami risk assessment in the region.

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ANALYSIS OF FINANCIAL PROVISION

	2013–14 (Actual) (\$m)	2014–15 (Original) (\$m)	2014–15 (Revised) (\$m)	2015–16 (Estimate) (\$m)
Programme				
(1) Weather Services.....	209.5	222.7	229.9	236.9
(2) Radiation Monitoring and Assessment.....	25.6	26.1	27.2	27.2
(3) Time Standard and Geophysical Services.....	10.7	11.0	11.4	11.4
	245.8	259.8	268.5 (+3.3%)	275.5 (+2.6%)
				(or +6.0% on 2014–15 Original)

Analysis of Financial and Staffing Provision

Programme (1)

Provision for 2015–16 is \$7.0 million (3.0%) higher than the revised estimate for 2014–15. This is mainly due to increased provision for salaries arising from the creation of seven additional posts and increased requirement for capital expenditure.

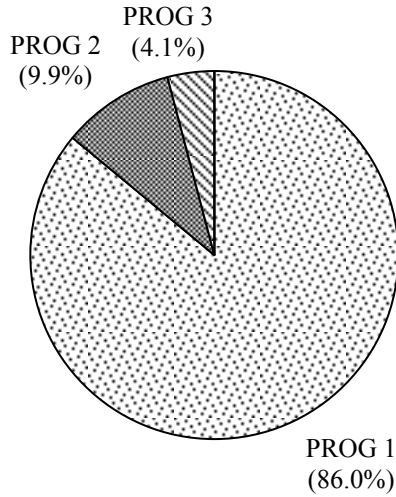
Programme (2)

Provision for 2015–16 is the same as the revised estimate for 2014–15.

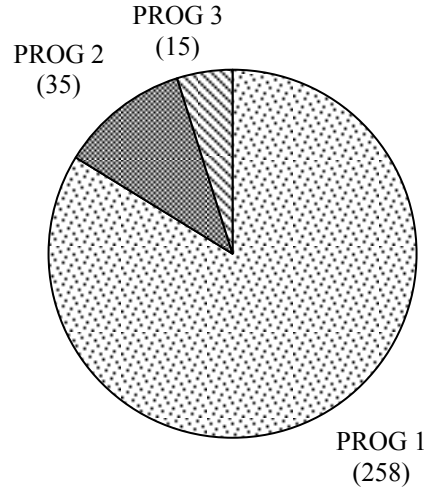
Programme (3)

Provision for 2015–16 is the same as the revised estimate for 2014–15.

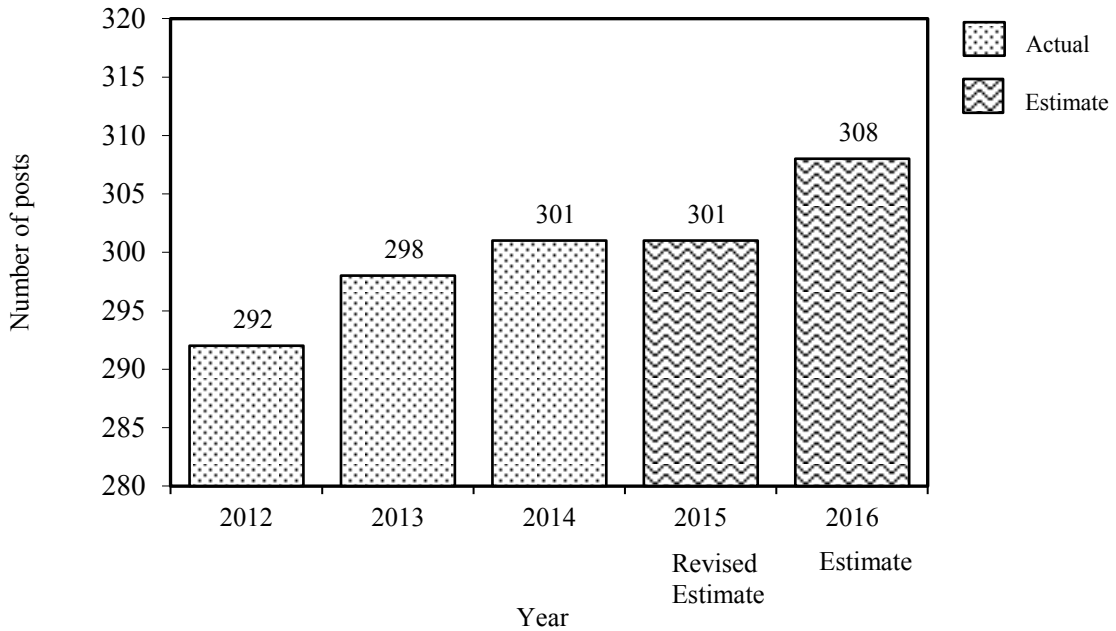
Allocation of provision to programmes (2015-16)



Staff by programme (as at 31 March 2016)



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



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Sub-head (Code)	Actual expenditure 2013–14	Approved estimate 2014–15	Revised estimate 2014–15	Estimate 2015–16	
	\$'000	\$'000	\$'000	\$'000	
Operating Account					
Recurrent					
000	Operational expenses	245,768	259,781	268,485	272,749
	Total, Recurrent	245,768	259,781	268,485	272,749
	Total, Operating Account	245,768	259,781	268,485	272,749
Capital Account					
Plant, Equipment and Works					
661	Minor plant, vehicles and equipment (block vote)	—	—	—	2,765
	Total, Plant, Equipment and Works	—	—	—	2,765
	Total, Capital Account	—	—	—	2,765
	Total Expenditure	245,768	259,781	268,485	275,514

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Details of Expenditure by Subhead

The estimate of the amount required in 2015–16 for the salaries and expenses of the Hong Kong Observatory is \$275,514,000. This represents an increase of \$7,029,000 over the revised estimate for 2014–15 and of \$29,746,000 over the actual expenditure in 2013–14.

Operating Account

Recurrent

2 Provision of \$272,749,000 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 2015 will be 301 permanent posts. It is expected that there will be an increase of seven posts in 2015–16. Subject to certain conditions, the controlling officer may under delegated power create or delete non-directorate posts during 2015–16, but the notional annual mid-point salary value of all such posts must not exceed \$151,705,000.

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

	2013–14 (Actual) (\$'000)	2014–15 (Original) (\$'000)	2014–15 (Revised) (\$'000)	2015–16 (Estimate) (\$'000)
Personal Emoluments				
- Salaries.....	159,290	163,239	172,021	176,154
- Allowances.....	1,733	1,553	1,448	1,633
- Job-related allowances.....	362	380	242	400
Personnel Related Expenses				
- Mandatory Provident Fund contribution.....	352	372	394	528
- Civil Service Provident Fund contribution.....	2,645	3,309	3,452	3,979
Departmental Expenses				
- General departmental expenses	81,279	90,813	90,813	89,940
Other Charges				
- World Meteorological Organization.....	107	115	115	115
	245,768	259,781	268,485	272,749

Capital Account

Plant, Equipment and Works

5 Provision of \$2,765,000 under *Subhead 661 Minor plant, vehicles and equipment (block vote)* represents an increase of \$2,765,000 over the revised estimate for 2014–15. This is mainly due to the increased requirement for replacement of equipment.