CHAPTER 4

Environment and Ecology Bureau
Hong Kong Observatory

Operation of the Hong Kong Observatory

Audit Commission
Hong Kong
31 March 2026

This audit review was carried out under a set of guidelines tabled in the Provisional Legislative Council by the Chairman of the Public Accounts Committee on 11 February 1998. The guidelines were agreed between the Public Accounts Committee and the Director of Audit and accepted by the Government of the Hong Kong Special Administrative Region.

Report No. 86 of the Director of Audit contains 8 Chapters which are available on our website (https://www.aud.gov.hk).

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OPERATION OF THE HONG KONG OBSERVATORY

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OPERATION OF THE HONG KONG OBSERVATORY

Executive Summary

1. The mission of the Hong Kong Observatory (HKO) is to provide people-oriented quality services in meteorology and related fields, and to enhance the society's capability in natural disaster prevention and responses, through science, innovation and partnership. HKO is responsible for providing round-the-clock meteorological and geophysical services, including weather services, radiation monitoring and assessment, and time standard and geophysical services.

2. HKO is organised into four functional branches, namely the Forecasting and Warning Services Branch, the Aviation Weather Services Branch, the Radiation Monitoring Assessment Branch, and the Development, Research and Administration Branch. As at 31 October 2025, HKO had an establishment of 366 staff and a strength of 345 staff. In 2024-25, the actual expenditure of HKO was $462.1 million. The Audit Commission (Audit) has recently conducted a review to examine the operation of HKO.

Provision of meteorological and geophysical services

3. ***Scope for improvement in preparing public weather forecast reviews.*** HKO issues a total of eight public weather forecasts to the public daily. After the issuance of public weather forecasts, according to HKO guidelines, all the weather forecasts issued to the public are routinely verified by HKO using an objective verification scheme (with a skill score given for each forecast) and reviewed verbally during weather conferences (see para. 4). In addition, for the forecasts issued at 19:45 and 23:15, if the forecast is given a skill score below the "acceptable level", a written forecast review is required to be prepared by the relevant duty forecasters. Audit noted that there was scope for improvement in preparing public weather forecast reviews (paras. 2.4 and 2.5), as follows:

(a) HKO guidelines did not clearly specify the skill score of "acceptable level" for requiring the preparation of a written forecast review. Upon Audit's enquiry, HKO informed Audit in January 2026 that a forecast was considered below the "acceptable level" if the skill score was lower than 70 (para. 2.5(a)); and

(b) of the 14,120 public weather forecasts issued from January 2021 to October 2025, 285 (2%) were with skill scores lower than 70 (i.e. below the "acceptable level"). According to HKO, 21 written forecast reviews covering 92 weather forecasts were prepared and uploaded onto HKO's Intranet for experience sharing, and the remaining 193 weather forecasts (which were issued at times other than 19:45 and 23:15) were reviewed verbally during weather conferences. In Audit's view, HKO needs to consider putting verbal reviews for public weather forecasts issued at times other than 19:45 and 23:15 with a skill score below the "acceptable level" into written records as far as practicable (para. 2.5(b)).

4. ***Need to improve attendance of Scientific Officer (SO) grade officers in weather conferences.*** According to HKO, routine weather conferences are held 2 times a day at the Central Forecasting Office (i.e. 1 in the morning and 1 in the afternoon) to discuss public weather forecasts. Weather conferences are presented by the duty forecasting team and attended by SO grade officers not in the duty forecasting team on a voluntary basis. According to HKO's staff notice, SO grade officers are expected to attend at least 25 morning and 25 afternoon weather conferences each year. In response to Audit's enquiry, HKO informed Audit in March 2026 that, in practice, SO grade officers were currently expected to attend a total of 50 weather conferences each year (regardless of being held in the morning or in the afternoon). Audit examined the attendance records of SO grade officers in weather conferences held at the Central Forecasting Office in 2025 and revealed that, 29 (45%) of the 65 SO grade officers (who had continuously served HKO for the full year in 2025) attended less than 50 weather conferences in 2025 (paras. 2.6, 2.8 and 2.9).

5. ***Need to enhance public's understanding of the tropical cyclone warning system.*** Since 2007, HKO has made reference to the wind speed data registered from a network of eight near-sea level reference anemometers covering the whole of Hong Kong when considering the issuance of Tropical Cyclone Warning Signal Nos. 3 and 8. Audit noted that, from time to time, HKO received public enquiries on the issuance of Tropical Cyclone Warning Signals. According to HKO:

(a) the Tropical Cyclone Warning Signals issued are based on scientific principles, the actual weather observations and forecasts, as well as the impact of a tropical cyclone on Hong Kong, which depends on many factors, including its circulation size, wind structure, direction and speed of movement, and distance from Hong Kong;

(b) extreme weather events have been becoming more frequent in the light of climate change. To enable better preparation and response against extreme weather, there had been increasing public demand on being notified of signal change well in advance over the years;

(c) to enable the public to well prepare for the upcoming deterioration of weather to minimise casualties, the Tropical Cyclone Warning Signals have to be issued with lead time. Due to limitations in forecasting technology, the longer the lead time of a forecast, the higher the forecast uncertainty. HKO has to take due consideration in upholding public safety in the operation of the Tropical Cyclone Warning Signals; and

(d) there was no fatality resulted by tropical cyclones reported in 2024 and 2025, even though there was a record-breaking number of tropical cyclones affecting Hong Kong in 2025 that issuance of the Tropical Cyclone Warning Signal No.10 was necessitated for twice.

In Audit's view, HKO needs to take measures to enhance public's understanding of the tropical cyclone warning system (paras. 2.20, 2.22 and 2.23).

6. ***Scope for monitoring of dissemination system.*** The Meteorological Information Dissemination System is a system developed in-house by HKO for the preparation of weather warnings, forecasts and reports for onward dissemination to downstream systems and users. On 12 October 2025, an internal message queue error happened on one of the Meteorological Information Dissemination System application servers. The error affected the dissemination of two weather bulletins to the public on various dissemination channels from 14:20 to 16:07 on that day. The dissemination of weather information resumed normal at 16:07 on the same day after switching the operations to a recovery site. In Audit's view, HKO needs to draw lessons from the system error incident and take measures to minimise the interruptions to the dissemination of weather information (paras. 2.31 and 2.33).

7. ***Need to enhance the monitoring of in-house preventive maintenance of meteorological and geophysical equipment/systems.*** To monitor and forecast weather, as well as to monitor radiation levels and tide levels in Hong Kong, HKO relies on the support of up-to-date meteorological and geophysical equipment/systems. According to HKO, for each piece of meteorological and geophysical equipment/system, preventive maintenance should be conducted according to the targeted preventive maintenance frequency. As at 31 December 2025, meteorological and geophysical equipment/systems were installed at 157 HKO stations at various locations in Hong Kong. Of the 157 HKO stations, 80 were managed under HKO's quality management systems while the other 77 were not. Audit noted that while management summary of in-house preventive maintenance was regularly compiled for the 80 HKO stations for monitoring whether preventive maintenance was conducted according to the targeted preventive maintenance frequency at equipment/system level, such management summary was not regularly compiled for the other 77 HKO stations (paras. 2.36 to 2.38).

8. ***Need to enhance the monitoring of in-house corrective maintenance of meteorological and geophysical equipment/systems.*** For meteorological and geophysical equipment/systems installed at the 157 HKO stations, HKO is also responsible for performing in-house corrective maintenance for meteorological and geophysical equipment/systems in case of equipment/system failure/faults. Audit noted that, HKO did not compile regular management summary on the equipment/system failure/faults experienced, response time to attend failure/faults, and the respective corrective maintenance records (e.g. fault rectification actions and time taken to complete corrective maintenance). Furthermore, HKO did not set target timeframes for its in-house maintenance teams to attend the equipment/system failure/faults at the HKO stations concerned and to complete the respective corrective maintenance (paras. 2.40 and 2.41).

Procurement and stores management

9. Similar to other government bureaux/departments (B/Ds), HKO's procurement activities and management of stores are governed by the Stores and Procurement Regulations (SPRs), relevant Financial Circulars, and the circulars and guidelines issued by the Government Logistics Department (GLD). In addition, HKO has set out its policy and procedures for procurement of stores and services and management of stores in its departmental guidelines and staff notices. From 2020-21 to 2025-26 (up to October 2025), HKO made 15,153 purchases of goods or services

by quotation (with contract values totalling $516.9 million) and 26 purchases of goods or services by tendering (with contract values totalling $384.2 million) (paras. 3.2 and 3.5).

10. ***Need to ensure timely submission of tender reports to the Departmental Tender Committee (DTC).*** According to HKO guidelines, the Tender Assessment Panel (set up for conducting tender evaluation) should submit tender reports to DTC (which would decide or give advice on the acceptance of tenders) at least four weeks before the expiry of the validity of the recommended tender or before the intended commencement date of the contract to be awarded, and at least five clear working days prior to the meeting of DTC. In case of a complex or urgent submission which cannot meet the deadline, the Tender Assessment Panel must state the reasons in the tender report for the delay and urgency in the tender submission. Of the 26 purchases by tendering from 2020-21 to 2025-26 (up to October 2025), 3 were handled through tender exercises arranged by GLD. Audit examined the tender reports of the 23 tender exercises conducted by HKO and noted that: (a) 2 (9%) tender reports were submitted 16 and 22 days (i.e. less than 4 weeks) before the intended commencement date of the contract to be awarded. Besides, these 2 tender reports were submitted to DTC 1 and 2 clear working days prior to the meeting of DTC; and (b) another 11 (48%) tender reports were submitted to DTC 1 to 4 clear working days (averaging 3 clear working days) (i.e. less than 5 clear working days) prior to the meeting of DTC. Audit further noted that the reasons for the delay and urgency were not stated in 12 of the 13 tender reports (paras. 3.4, 3.5, 3.9 and 3.10).

11. ***Need to ensure that the performance of suppliers is evaluated as required.*** According to SPRs, B/Ds shall devise an effective monitoring mechanism to ensure that a contractor or consultant performs to standard and complies with the terms of a contract. Besides, for contracts with a value exceeding the quotation limits, B/Ds shall evaluate the performance of their contractors or consultants at least once every six months until completion of the contract for contracts lasting more than one year. Audit noted that: (a) there was no consolidated management summary for HKO to monitor the completion of evaluation of suppliers' performance and cases of non-conformance and unsatisfactory performance; and (b) from 2020-21 to 2025-26 (up to October 2025), HKO made 26 purchases (with a value exceeding the quotation limits) by tendering, including 25 contracts lasting more than one year. As at 31 October 2025, suppliers' performance was not evaluated at least once every six months for 19 (76% of 25) contracts (paras. 3.16 and 3.18).

12. ***Scope for improvement in the monitoring of excessive stock.*** According to GLD guidelines, keeping excessive stock will induce not only quality problems and financial loss such as degradation and potential obsolescence leading to the need to dispose of such stores item, but also incur unnecessary stockholding costs and tie up capital cost. According to HKO, as at 31 December 2025, it had 18 store units, of which 10 store units adopted a computer system for stock management and 8 store units used manual ledger sheets for administrative convenience having regard to the small numbers of transactions. Audit noted that there was scope for improvement in the monitoring of excessive stock by HKO (paras. 3.28 and 3.29), as follows:

(a) ***Need to arrange possible utilisation of the excessive stock identified.*** As at 31 December 2025, there were excessive stocks (i.e. items with a stock balance greater than the average annual consumption of the past 3 years) for 135 types of stores items in 6 of the 10 store units adopting a computer system for stock management (para. 3.29(a)); and

(b) ***Need to compile regular management summary.*** HKO did not compile any regular management summary on the stock balance and consumption of stores items for the identification of excessive or dormant stores items for the 8 store units using manual ledger sheets (para. 3.29(b)).

13. ***Need to ensure timely completion of projects for procurement of computer systems and equipment.*** From 2020-21 to 2025-26 (up to October 2025), HKO commenced 6 projects funded under the Capital Works Reserve Fund (CWRF) Head 708 (i.e. for procurement of major systems and equipment) and 34 projects funded under CWRF Head 710 (i.e. for procurement of administrative computer systems). Audit noted that there were delays in completion of some projects. As at 31 October 2025: (a) the 6 projects funded under CWRF Head 708 were still in progress, of which 4 (67%) had been delayed by 10 months to 3.3 years (averaging 2 years) from the respective original target completion dates; and (b) of the 34 projects funded under CWRF Head 710, 19 (56%) had been completed, of which 12 (63% of 19) were completed 1 to 10 months (averaging 4 months) after the respective original target completion dates. The remaining 15 (44%) projects were still in progress, of which 1 (7% of 15) had been delayed by 1 month from the original target completion date (paras. 3.36 and 3.37).

14. ***Scope for improvement in estimating the costs of projects for procurement of computer systems and equipment.*** Audit noted that there were unspent balances under the completed projects for procurement of computer systems and equipment. As at 31 October 2025: (a) the total unspent balance of the 19 completed projects funded under CWRF Head 710 was $7.3 million (i.e. 6% of their approved project estimates); and (b) in particular, the unspent balances of 6 (32% of 19) completed projects were 11% to 34% (averaging 16%) of the respective approved project estimates. In Audit's view, HKO needs to make better estimates of the costs of projects for procurement of computer systems and equipment before seeking funding approval (paras. 3.39 and 3.40).

Other issues

15. ***Need to consider organising more educational activities for the public.*** HKO promotes awareness of high-impact weather, impacts of climate change and its services through public education and publicity, and organises different types of educational activities for the public. Audit noted that the numbers of the following educational activities organised by HKO decreased in recent years: (a) the "Gamma-Go" Workshop is an experiential activity launched by HKO in March 2021. While 24 to 29 schools successfully applied for 24 to 30 workshops annually from 2021 to 2023, 13 and 14 schools successfully applied for 13 and 14 workshops in 2024 and 2025 respectively; (b) from 2015 to 2019, HKO organised 111 to 139 guided tours (averaging 128 guided tours) of its Headquarters each year and the annual numbers of visitors ranged from 3,331 to 3,820 (averaging 3,640). However, from 2023 to 2025, HKO organised 62 to 71 guided tours (averaging 68 guided tours) each year and the annual numbers of visitors ranged from 1,486 to 1,939 (averaging 1,762); and (c) from 2015 to 2019, HKO organised a total of four public courses on weather observation with a quota of around 135 seats each and each course had 127 to 137 participants (averaging 132 participants). Since then and up to December 2025, HKO only organised the course once with a quota of 100 seats in 2023 with 97 participants (paras. 4.2 and 4.3).

16. ***Need to continue to review the production of educational videos.*** HKO has produced a programme series of educational videos known as the "Cool Met Stuff" (CMS) since January 2014 which is broadcast every Friday. Audit noted that: (a) the production frequency had been reduced from one new video every week to every two weeks on average (i.e. bi-weekly) since August 2022; (b) HKO had set annual targets on the number of views of CMS videos. While CMS videos were

uploaded onto 4 social media platforms, HKO only included the numbers of views on 2 platforms in its annual target; and (c) while some CMS videos were very popular, the content of some videos might not be as appealing to the audience as the other videos. For example, in 2024, HKO produced 24 CMS videos. As at 31 December 2025, the total cumulative numbers of views of the 24 videos on the 2 social media platforms included in HKO's annual targets ranged from about 10,000 to 156,000 (averaging 51,000). In Audit's view, HKO needs to continue to review the production of CMS videos (paras. 4.5, 4.6 and 4.8).

17. ***Need to closely monitor the works progress of the Annex Block project.*** Staff of HKO are accommodated at the Headquarters in Tsim Sha Tsui and three other offices, including the Mira Place Tower Office in Tsim Sha Tsui. As at 31 October 2025, the total floor area of these four offices was about 5,817 square metres. According to HKO, there is a need to construct an Annex Block in the existing open car park and its vicinity at the Headquarters to provide the necessary space (e.g. for developing and enhancing the services of HKO). Audit noted that: (a) long time was taken at the planning and design stage for the Annex Block project before the commencement of construction works. While a preliminary study on the redevelopment proposal was completed in August 2010 and HKO decided in March 2015 to focus on studying the technical feasibility of constructing a new building at the existing open car park, the works commenced in late May 2025 for completion in around 4 years (i.e. 2029); and (b) as the entire site of the Headquarters is a declared monument site, the construction of the Annex Block faced additional challenges and complexities as compared to typical construction projects. Given the construction difficulties of the project and importance of the Annex Block in supporting the services of HKO, in Audit's view, HKO needs to closely monitor the works progress of the Annex Block project (paras. 4.19 to 4.21, 4.23 and 4.24).

18. ***Need to keep under review the utilisation of facilities for visits by the public.*** According to HKO, apart from the Resource Centre in its Mira Place Tower Office, it also set up an Exhibition Hall and a History Room for visits by the public at its Headquarters. Audit noted that: (a) in 2025, there were more than 10,000 visitors to the Exhibition Hall but only 217 visitors to the Resource Centre (i.e. less than 1 visitor per day on average); and (b) as far as could be ascertained, HKO did not compile regular management summary on the numbers of visitors to the History Room. In Audit's view, HKO needs to keep under review the utilisation of facilities for visits by the public and take measures to increase the utilisation (paras. 4.25 to 4.27).

Audit recommendations

19. **Audit recommendations are made in the respective sections of this Audit Report. Only the key ones are highlighted in this Executive Summary. Audit has *recommended* that the Director of the Hong Kong Observatory should:**

Provision of meteorological and geophysical services

(a) **regarding the preparation of public weather forecast reviews:**

(i) **clearly specify in HKO guidelines the skill score of "acceptable level" below which preparation of a written forecast review is required under the objective verification scheme (para. 2.17(a)(i)); and**

(ii) **consider putting verbal reviews for public weather forecasts issued at times other than 19:45 and 23:15 with a skill score below the "acceptable level" into written records as far as practicable with a view to further facilitating experience sharing (para. 2.17(a)(ii));**

(b) **update the staff notice to reflect the latest change in operational circumstances and current practice where appropriate (e.g. the current expected attendance in weather conferences held at the Central Forecasting Office each year) (para. 2.17(b));**

(c) **take measures to improve the attendance of SO grade officers in weather conferences held at the Central Forecasting Office (para. 2.17(c));**

(d) **take measures to enhance public's understanding of the tropical cyclone warning system (para. 2.34(a));**

(e) **draw lessons from the system error incident and take measures to minimise the interruptions to the dissemination of weather information (para. 2.34(d));**

(f) **take measures to enhance the monitoring of in-house preventive maintenance, including:**

(i) **compiling regular management summary on preventive maintenance records for meteorological and geophysical equipment/systems not managed under HKO's quality management systems for monitoring purpose (para. 2.46(a)(i)); and**

(ii) **taking follow-up actions on non-compliant cases where appropriate (para. 2.46(a)(ii));**

(g) **take measures to enhance the monitoring of in-house corrective maintenance of meteorological and geophysical equipment/systems, including:**

(i) **compiling regular management summary on the equipment/system failure/faults experienced and the respective corrective maintenance records for monitoring purpose (para. 2.46(b)(i)); and**

(ii) **considering setting target timeframes for the HKO in-house maintenance teams to attend equipment/system failure/faults at the HKO stations concerned and to complete the respective corrective maintenance, where appropriate (para. 2.46(b)(ii));**

Procurement and stores management

(h) **take measures to ensure that tender reports are timely submitted to DTC for consideration and state the reasons for the delay and urgency in the tender reports in accordance with HKO guidelines (para. 3.25(b));**

(i) **take measures to ensure that the performance of suppliers is evaluated in accordance with relevant guidelines, including compiling management summary on the completion of evaluation forms and the written warnings issued to suppliers to facilitate monitoring by the management (para. 3.25(d));**

(j) **arrange possible utilisation of the excessive stock identified as early as practicable (para. 3.34(a));**

(k) **compile regular management summary to facilitate the identification of excessive or dormant stores items in the store units using manual ledger sheets (para. 3.34(b));**

(l) **take measures to ensure timely completion of projects for procurement of computer systems and equipment (para. 3.41(a));**

(m) **make better estimates of the costs of projects for procurement of computer systems and equipment before seeking funding approval (para. 3.41(b));**

Other issues

(n) **consider organising more educational activities for the public with a view to reaching the public more to promote awareness of high-impact weather, impacts of climate change and HKO's services (para. 4.17(a));**

(o) **continue to review the production of CMS videos with a view to formulating further improvement measures for CMS taking into account all relevant factors (para. 4.17(b));**

(p) **closely monitor the works progress of the Annex Block project with a view to ensuring timely commissioning of the Annex Block (para. 4.32(a)); and**

(q) **keep under review the utilisation of facilities for visits by the public and take measures to increase the utilisation (para. 4.32(b)).**

Response from the Government

20. The Director of the Hong Kong Observatory agrees with the audit recommendations.

PART 1: INTRODUCTION

1.1 This PART describes the background to the audit and outlines the audit objectives and scope.

Background

1.2 The mission of the Hong Kong Observatory (HKO) is to provide people-oriented quality services in meteorology and related fields, and to enhance the society's capability in natural disaster prevention and responses, through science, innovation and partnership. HKO is responsible for providing the following round-the-clock meteorological and geophysical services:

(a) ***Weather services.*** HKO provides weather forecasts and issues warnings to the public, special users, the marine community and the aviation sector in order to reduce loss of life and damage to property, and minimise disruptions to economic and social activities during hazardous weather. The work involves, for example:

(i) operating a range of weather monitoring equipment/systems (e.g. a territory-wide network of automatic weather stations (AWSs — Note 1) (see Photograph 1 for an example of an AWS) and a network of weather sensors at the Hong Kong International Airport (HKIA));

Note 1: *According to HKO, the AWS network collects vital meteorological data essential for the provision of weather forecasting and warning services in Hong Kong. A typical AWS usually comprises several conventional instruments to measure air temperature, relative humidity, wind speed, wind direction, rainfall and atmospheric pressure.*

Photograph 1

An example of an AWS:
Clear Water Bay AWS in Sai Kung

Source: HKO records

(ii) exchanging real-time data with other meteorological centres worldwide;

(iii) analysing meteorological data and computing the future weather;

(iv) disseminating weather information and issuing warnings and advisory messages on hazardous weather; and

(v) conducting public education and publicity;

(b) ***Radiation monitoring and assessment.*** HKO provides information on environmental radiation levels in Hong Kong and advises government departments on the protective actions that may be necessary during nuclear emergencies. HKO monitors ambient radiation levels in Hong Kong and conducts radiological measurements on air, soil, water and food. The work involves, for example:

(i) operating a range of radiation monitoring and assessment facilities (e.g. aerial radiation monitoring system, radiological survey vehicles and radiation laboratory); and

(ii) planning and participating in exercises and drills in response to nuclear emergencies; and

(c) ***Time standard and geophysical services.*** HKO maintains a network of caesium beam atomic clocks as the Hong Kong time standard, and provides time signals, and geophysical, oceanographic, astronomical and climatological information to the public. HKO also monitors earthquakes and the sea level and releases related information to the public, including the operation of the tsunami warning system.

1.3 ***Actual expenditure of HKO.*** Table 1 shows the actual expenditure of HKO for each category of services from 2020-21 to 2024-25.

Table 1

Actual expenditure of HKO
(2020-21 to 2024-25)

Year	Actual expenditure			
	Weather services (a) ($ million)	**Radiation monitoring and assessment (b) ($ million)**	**Time standard and geophysical services (c) ($ million)**	**Total (d) = (a)+(b)+(c) ($ million)**
2020-21	345.0 (85%)	37.1 (9%)	26.3 (6%)	408.4 (100%)
2021-22	337.4 (86%)	35.6 (9%)	20.8 (5%)	393.8 (100%)
2022-23	355.8 (88%)	30.7 (7%)	19.4 (5%)	405.9 (100%)
2023-24	389.0 (88%)	36.9 (8%)	18.9 (4%)	444.8 (100%)
2024-25	406.4 (88%)	36.2 (8%)	19.5 (4%)	462.1 (100%)

Source: HKO records

1.4 ***Dissemination of weather information.*** HKO disseminates general weather information and provides specialised weather services, as follows:

(a) ***Dissemination of general weather information to the public.*** HKO delivers and broadcasts weather information, forecasts and warnings on hazardous weather to the public free of charge through a variety of dissemination channels (e.g. HKO's website and mobile application "MyObservatory" — see Figure 1); and

Figure 1

Mobile application "MyObservatory"

Source: *HKO records*

(b) ***Provision of specialised weather services.*** HKO provides extensive weather information (e.g. convection forecast in support of air traffic flow management) and specialised weather and warning services to subscribed users (e.g. public transport operators and engineering contractors) as well as the aviation community under the International Civil Aviation Organization framework via the Airport Authority Hong Kong (AAHK) on a cost-recovery basis. In 2024-25, there were a total of 75 users (i.e. 74 subscribed users and AAHK), and the revenue generated from providing specialised weather services to them was $149.7 million (Note 2). Table 2 shows the revenue generated from providing specialised weather services from 2020-21 to 2024-25.

Note 2: *Of the $149.7 million: (a) $148.8 million (99%) was generated from AAHK; and (b) $0.9 million (1%) was generated from the other 74 subscribed users. All fees and charges for services provided were reviewed and revised timely on a cost-recovery basis in accordance with the relevant Financial Circular, and achieved full-cost recovery from 2022-23 to 2024-25 (from August 2019 to December 2021, the Government had implemented a fee review moratorium on fees and charges).*

Table 2

Revenue generated from providing specialised weather services (2020-21 to 2024-25)

Year	Revenue ($ million)
2020-21	140.6
2021-22	142.3
2022-23	176.8 (Note)
2023-24	153.3
2024-25	149.7

Source: *HKO records*

Note: *According to HKO, the increase was mainly due to the provision of additional services to AAHK during the construction of the Three Runway System at HKIA.*

Staff strength and expenditure

1.5 HKO, headed by the Director of the Hong Kong Observatory, is organised into four functional branches, namely:

(a) ***Forecasting and Warning Services Branch.*** The Forecasting and Warning Services Branch is mainly responsible for providing weather forecasting service and issuing warnings on inclement weather;

(b) ***Aviation Weather Services Branch.*** The Aviation Weather Services Branch is mainly responsible for providing aviation weather facilities and services for international air navigation at HKIA;

(c) ***Radiation Monitoring Assessment Branch.*** The Radiation Monitoring Assessment Branch is mainly responsible for environmental radiation monitoring and meteorological measurements, emergency preparedness and assessment, information technology management, and departmental training; and

(d) ***Development, Research and Administration Branch.*** The Development, Research and Administration Branch is mainly responsible for providing time standard and geophysical services, conducting climate research, and handling other administration services.

As at 31 October 2025, HKO had an establishment of 366 staff (comprising 305 professional and technical staff and 61 supporting staff), and a strength of 345 staff (comprising 287 professional and technical staff and 58 supporting staff). In 2024-25, of the actual expenditure of HKO of $462.1 million, $266.7 million (58%) and $20.8 million (5%) were attributed to staff salaries/allowances and staff related expenses respectively.

Procurement of goods and services

1.6 HKO procures various goods (e.g. computer systems and meteorological equipment) and services (e.g. security guard services and telecommunication services) to provide public services and maintain its operation. In 2024-25, HKO incurred expenditure of $193.1 million under the General Revenue Account (GRA) and $126.4 million under the Capital Works Reserve Fund (CWRF) on the procurement of goods and services. Photograph 2 shows an example of equipment procured by HKO.

Photograph 2

An example of equipment procured by HKO:
Terminal Doppler Weather Radar for detecting windshear near HKIA

Source: *HKO records*

Public education and publicity

1.7 HKO promotes awareness of high-impact weather, impacts of climate change and its services through public education and publicity. Educational events and outreach activities such as public talks, seminars, workshops, public courses, and exhibitions (including open days) are regularly organised. HKO also produces public education and publicity materials, and arranges media interviews.

Office accommodation

1.8 According to HKO, its staff are accommodated at the Headquarters in Tsim Sha Tsui and three other offices, namely the Mira Place Tower Office in Tsim Sha Tsui, the Airport Meteorological Office at HKIA, and the King's Park Laboratory and Meteorological Station in Ho Man Tin. As at 31 October 2025, the total floor area of these four offices was about 5,817 square metres (m^2).

Audit review

1.9 In November 2025, the Audit Commission (Audit) commenced a review to examine the operation of HKO. The audit review has focused on the following areas:

(a) provision of meteorological and geophysical services (PART 2);

(b) procurement and stores management (PART 3); and

(c) other issues (PART 4).

Audit has found room for improvement in the above areas and has made a number of recommendations to address the issues.

Acknowledgement

1.10 Audit would like to acknowledge with gratitude the full cooperation of the staff of HKO during the course of the audit review.

PART 2: PROVISION OF METEOROLOGICAL AND GEOPHYSICAL SERVICES

2.1 This PART examines HKO's work in provision of meteorological and geophysical services, focusing on:

(a) weather monitoring and forecasting (paras. 2.2 to 2.18);

(b) dissemination of weather information and issuance of warnings (paras. 2.19 to 2.35); and

(c) maintenance of meteorological and geophysical equipment/systems (paras. 2.36 to 2.47).

Weather monitoring and forecasting

2.2 HKO is responsible for monitoring and forecasting weather to meet the needs of the public, special users, the marine community and the aviation sector. The work involves:

(a) ***Public weather monitoring.*** HKO operates a range of weather monitoring equipment/systems, including a territory-wide network of AWSs (see Note 1 to para. 1.2(a)(i)), a network of cameras and visibility meters for providing real-time weather photos and visibility readings, a lightning location network for detecting lightning and Doppler weather radars for detecting the intensity and movement of rain areas. HKO also exchanges real-time data with other meteorological centres worldwide and receives satellite imageries from a variety of meteorological satellites (e.g. images covering West Asia from the Fengyun-4B satellite);

(b) ***Public weather forecasting.*** HKO uses computer models to simulate and predict the evolution of weather systems over East Asia and the western North Pacific. The model results form the basis for forecasting the weather in Hong Kong and the adjacent seas, as well as for providing the public with weather forecasts in fine spatial and temporal resolution. For local weather, the 9-day Weather Forecast is issued on a daily basis. In addition,

HKO operates a nowcasting (Note 3) system which assimilates data from radars and AWSs to provide objective rainfall forecasts in the vicinity of Hong Kong a few hours ahead for forecasters' reference; and

(c) ***Weather observation and forecasting for aviation.*** Within the International Civil Aviation Organization framework, HKO is the designated meteorological authority in Hong Kong to provide the weather facilities and services for international air navigation to contribute towards the safety, regularity and efficiency of international aircraft operations.

2.3 ***Operational centres of HKO.*** HKO operates the following two operational centres round-the-clock to prepare forecasts for the dissemination of weather information and various warnings on inclement weather:

(a) ***Central Forecasting Office.*** The Central Forecasting Office (located at the HKO Headquarters in Tsim Sha Tsui) is manned round-the-clock to monitor weather conditions and to provide the public with the latest weather information including warnings and forecasts; and

(b) ***Airport Meteorological Office.*** Weather observers and aviation forecasters work round-the-clock at the Airport Meteorological Office (located at HKIA) to make routine and special weather observations and to provide enroute forecasts as well as aerodrome forecasts for HKIA.

Note 3: *According to HKO, nowcasting refers to forecasting of weather in the next few hours, primarily on severe weather such as heavy rain, lightning, hail and thunderstorm-induced gust.*

Scope for improvement in preparing public weather forecast reviews

2.4 HKO issues a total of eight public weather forecasts to the public daily (at 01:45, 04:45, 07:45, 09:45, 11:45, 16:15, 19:45 and 23:15 daily) (Note 4). After the issuance of public weather forecasts, according to HKO guidelines:

(a) all the weather forecasts issued to the public are routinely verified by HKO using an objective verification scheme (Note 5). Under the objective verification scheme, a skill score based on six individual weather elements (Note 6) is given for each forecast issued to the public. A forecast is considered accurate if its skill score is greater than or equal to 85; and

(b) all the weather forecasts issued to the public are reviewed verbally during weather conferences (see para. 2.6). In addition, for the forecasts issued at 19:45 and 23:15, if the forecast is given a skill score below the "acceptable level" (see para. 2.5(a)), a written forecast review is required to be prepared by the relevant duty forecasters.

Note 4: *According to HKO, each forecast covers a different forecast period as stated in the content of the forecast bulletin. Forecasts issued at 16:15, 19:45 and 23:15 cover a forecast period up to the end of the following day while forecasts issued at 01:45, 04:45, 07:45, 09:45 and 11:45 cover a forecast period up to the end of the same day.*

Note 5: *According to HKO, the methodology of the objective verification scheme is based on purely objective comparison of forecast and observed weather elements. The scheme aligns with the fundamental principle in the "Guidelines on Performance Assessment of Public Weather Services" published by the World Meteorological Organization.*

Note 6: *According to HKO guidelines, a skill score is calculated by taking into account the differences between the local weather forecasts and actual observations of six individual weather elements, namely wind speed, state of sky, precipitation, visibility, maximum temperature and minimum temperature.*

2.5 From January 2021 to October 2025 (involving 1,765 days), HKO issued a total of 14,120 (1,765 days × 8) public weather forecasts. Of the 14,120 public weather forecasts, 12,863 (91%) were with skill scores greater than or equal to 85 (i.e. considered accurate). Audit noted that there was scope for improvement in preparing public weather forecast reviews, as follows:

(a) ***Skill score of "acceptable level" below which preparation of a written forecast review is required not clearly specified.*** HKO guidelines did not clearly specify the skill score of "acceptable level" for requiring the preparation of a written forecast review. Upon Audit's enquiry, HKO informed Audit in January 2026 that a forecast was considered below the "acceptable level" if the skill score was lower than 70. In Audit's view, regarding the preparation of public weather forecast reviews, HKO needs to clearly specify in HKO guidelines the skill score of "acceptable level" below which preparation of a written forecast review is required under the objective verification scheme; and

(b) ***Need to consider putting verbal reviews for forecasts with a skill score below the "acceptable level" into written records.*** According to HKO guidelines, all the weather forecasts issued to the public are reviewed verbally during weather conferences. In addition, for the forecasts issued at 19:45 and 23:15, if the forecast is given a skill score below the "acceptable level", a written forecast review is required to be prepared by the relevant duty forecasters (see para. 2.4(b)). Of the 14,120 public weather forecasts issued from January 2021 to October 2025, 285 (2%) were with skill scores lower than 70 (i.e. below the "acceptable level"), ranging from 26 to 69 (averaging 56). According to HKO:

(i) 21 written forecast reviews covering 92 weather forecasts (including 30 weather forecasts issued at 19:45 or 23:15 and 62 weather forecasts issued at other times with skill scores lower than 70 (Note 7)) were prepared and uploaded onto HKO's Intranet for experience sharing. Examples of key issues identified from these written forecast reviews included overestimation or underestimation

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Note 7: *According to HKO, written forecast reviews prepared for forecasts issued at 19:45 and 23:15 not only cover the forecasts issued at 19:45 or 23:15 with skill scores lower than 70, but also the forecasts issued at other times if they have overlapped forecast periods and were given skill scores lower than 70.*

of precipitation, incorrect prediction of coastal fog or its timing, and overestimation or underestimation of minimum temperature; and

(ii) the remaining 193 (285 minus 92) weather forecasts issued at times other than 19:45 and 23:15 with skill scores lower than 70 were reviewed verbally during weather conferences.

Audit acknowledges that weather itself exhibits randomness which limited the predictability, making weather forecasting a challenging task. In Audit's view, regarding the preparation of public weather forecast reviews, HKO needs to consider putting verbal reviews for public weather forecasts issued at times other than 19:45 and 23:15 with a skill score below the "acceptable level" into written records as far as practicable with a view to further facilitating experience sharing.

Need to improve attendance of Scientific Officer grade officers in weather conferences

2.6 According to HKO:

(a) routine weather conferences are held 2 times a day at the Central Forecasting Office (i.e. 1 in the morning and 1 in the afternoon) from Monday to Friday (except public holidays, or when Rainstorm or Tropical Cyclone Warning Signal is in effect) to discuss public weather forecasts (Note 8); and

(b) weather conferences are presented by the duty forecasting team and attended by Scientific Officer (SO) grade officers not in the duty forecasting team on a voluntary basis.

Note 8: *According to HKO, on Saturdays, Sundays, public holidays, or when Rainstorm or Tropical Cyclone Warning Signal is in effect where the routine weather conference is not held, public weather forecasts are discussed among the duty forecasting team with guidance provided by the directorate officers.*

2.7 According to HKO guidelines:

(a) it is recognised that the state of the science of weather forecasting does not permit completely objective forecasts to be made, and experience of the forecasters is still a very important element in making a good forecast;

(b) the main objective of the routine weather conferences is to pool all experience together to assist the duty forecasting team to appraise the current situation and to determine its most probable developments in the future. Another objective of attending weather conferences is to allow officers to keep abreast of the practice and procedures of weather forecasting and to contribute to the routine operation; and

(c) officers attending the weather conference are expected to assist the duty forecasting team by examining critically the reasoning and logic behind the proposed forecasts, whether the forecasts are self-consistent as well as the wording of the weather bulletin.

2.8 According to a staff notice issued to all SO grade officers in February 2015, SO grade officers are expected to attend at least 25 morning and 25 afternoon weather conferences held at the Central Forecasting Office each year. In response to Audit's enquiry, HKO informed Audit in March 2026 that:

(a) the staff notice was issued in February 2015 (i.e. over 10 years ago). Over the years, SO grade officers had also participated in other activities in addition to weather conferences held at the Central Forecasting Office, such as internal technical forums and international conferences, thematic scientific research, as well as preparation of scientific papers and articles; and

(b) due to changes in operational circumstances, in practice, SO grade officers were currently expected to attend a total of 50 weather conferences held at the Central Forecasting Office each year (regardless of being held in the morning or in the afternoon).

2.9 In 2025, there were a total of 436 weather conferences held at the Central Forecasting Office by HKO. In this connection, Audit examined the attendance records of SO grade officers in weather conferences held at the Central Forecasting Office in 2025 and revealed that, 29 (45%) of the 65 SO grade officers (who had continuously served HKO for the full year in 2025) attended less than 50 weather conferences in 2025. According to HKO:

(a) the main reason for the attendance shortfall was due to the unprecedentedly frequent number of severe weather events in 2025 (viz. 14 tropical cyclones necessitating the issuance of Tropical Cyclone Warning Signals, and 5 rainfall events necessitating the issuance of Black Rainstorm Warning Signals); and

(b) HKO staff, in particular SO grade officers, were heavily engaged in operational duties to ensure smooth operation of various systems in support of the weather services provided by HKO during severe weather. In fact, during the times when Rainstorm or Tropical Cyclone Warning Signal was in effect, some SO grade officers not in the duty forecasting team came to the Central Forecasting Office to offer views on strategies regarding forecasting and warning, public communications, etc., though not in a way of the routine weather conference.

2.10 In Audit's view, HKO needs to:

(a) update the staff notice to reflect the latest change in operational circumstances and current practice where appropriate (e.g. the current expected attendance in weather conferences held at the Central Forecasting Office each year); and

(b) take measures to improve the attendance of SO grade officers in weather conferences held at the Central Forecasting Office.

Need to keep under review and evaluate the results of trial operations in weather forecasting

2.11 Audit noted that, as at 31 October 2025, HKO had been carrying out various trial operations in weather monitoring and forecasting with a view to further enhancing its services in meteorology and related fields, including:

(a) ***Extension of weather forecast period from 9 days to 14 days.*** Currently, HKO issues the 9-day Weather Forecast to the public, providing general indications of the trends in weather for the coming 9 days. According to HKO:

(i) it has started preparing the 14-day Weather Forecast as an internal trial operation to extend the weather forecast period from 9 days to 14 days by deploying internal resources without incurring additional cost since November 2023;

(ii) the weather forecast for Days 10 to 14 is currently for internal reference only as the capability of capturing severe weather events (e.g. heavy rain, low visibility and high winds) needs to be studied and evaluated before releasing the forecast to the public; and

(iii) the full implementation date will be established when objective verification results of a few years are made available to evaluate the forecasting performance and accuracy for Days 10 to 14; and

(b) ***Hourly probability of windshear at HKIA for the next 72 hours.*** HKO has commenced internal trial operation of hourly probability of windshear at HKIA for the next 72 hours by deploying internal resources since May 2025. The trial operation was targeted to be completed by March 2026.

2.12 Audit noted that while HKO had set a target completion timeframe for the trial operation of hourly probability of windshear at HKIA for the next 72 hours, it had not set a concrete timeframe for the trial operation of extension of weather forecast period from 9 days to 14 days. In Audit's view, HKO needs to keep under review and evaluate the results of trial operations in weather forecasting, and formulate full implementation timeframes where appropriate.

Need to keep under review the latest development of technology in meteorological forecasting to cope with extreme weather conditions

2.13 The global climate crisis is becoming increasingly severe. Global warming and extreme weather events caused by climate change have been intensifying. According to HKO, 2023, 2024 and 2025 were the three warmest years on record globally. In line with the global trend, Hong Kong is facing problems such as rising temperature and more frequent extreme weather events.

2.14 The Chief Executive of the Hong Kong Special Administrative Region of the People's Republic of China announced in his 2023 Policy Address that:

(a) with global climate change intensifying, it was likely that Hong Kong would experience extreme weather more often. The Government would enhance the handling capabilities in respect of early warning, emergency preparedness, response and recovery to minimise the impact on society, with protecting people's safety as the Government's priority; and

(b) to strengthen Hong Kong's capability in coping with extreme weather conditions, the Government would explore ways to use big data, artificial intelligence (AI) and other technology to improve risk assessment capabilities on aspects of more uncertainties, such as meteorological forecast and alerts.

2.15 Audit noted that, HKO, as the meteorological authority in Hong Kong, had been enhancing its capabilities in meteorological forecasting to cope with extreme weather conditions, including:

(a) ***Rainstorm nowcasting.*** According to HKO, it has been enhancing the rainstorm nowcasting system, utilising state-of-the-art nowcasting technologies including AI, machine learning techniques and deep learning nowcasting models. In this connection, in view of the increasingly frequent extreme rainfall events due to climate change, HKO launched the Localised Heavy Rain Advisory service in 2021 by incorporating rainfall forecast from the nowcasting system to alert the public of imminent localised heavy rain for taking precautionary measures if the heavy rain at that time does not extend generally over Hong Kong and reach the criteria for a Red or Black Rainstorm Warning Signal;

(b) ***Tropical cyclone track forecasting.*** Hong Kong is facing more severe threats caused by extreme weather including tropical cyclones. HKO has been running AI weather prediction models on a trial basis since mid-2023 (as at 31 October 2025, about $8.8 million was incurred for the development of AI weather prediction models and related forecasting tools), which provide objective forecasts including wind direction, wind speed, temperature, and mean sea-level pressure, as a reference for formulation of the 9-day Weather Forecast and tropical cyclone track forecasts; and

(c) ***Collaboration with other meteorological authorities.*** HKO has been conducting technical exchanges with meteorological authorities of various countries and regions (including the Chinese Mainland and Macao). For example, in the 37th Guangdong-Hong Kong-Macao Seminar on Meteorological Science and Technology held in March 2025, representatives from the Guangdong Meteorological Service, HKO, and the Macao Meteorological and Geophysical Bureau discussed applications of AI on weather forecasting and the latest weather forecast technology.

2.16 In Audit's view, HKO needs to continue to explore the latest development of technology in meteorological forecasting with a view to further strengthening its capabilities in coping with extreme weather conditions.

Audit recommendations

2.17 **Audit has *recommended* that the Director of the Hong Kong Observatory should:**

(a) **regarding the preparation of public weather forecast reviews:**

(i) **clearly specify in HKO guidelines the skill score of "acceptable level" below which preparation of a written forecast review is required under the objective verification scheme; and**

(ii) **consider putting verbal reviews for public weather forecasts issued at times other than 19:45 and 23:15 with a skill score below the "acceptable level" into written records as far as**

practicable with a view to further facilitating experience sharing;

(b) **update the staff notice to reflect the latest change in operational circumstances and current practice where appropriate (e.g. the current expected attendance in weather conferences held at the Central Forecasting Office each year);**

(c) **take measures to improve the attendance of SO grade officers in weather conferences held at the Central Forecasting Office;**

(d) **keep under review and evaluate the results of trial operations in weather forecasting, and formulate full implementation timeframes where appropriate; and**

(e) **continue to explore the latest development of technology in meteorological forecasting with a view to further strengthening HKO's capabilities in coping with extreme weather conditions.**

Response from the Government

2.18 The Director of the Hong Kong Observatory generally agrees with the audit recommendations. He has said that:

(a) HKO will update relevant guidelines to include the skill score of "acceptable level" and explore keeping written records of oral reviews for forecasts with a skill score below the "acceptable level" other than those issued at 19:45 and 23:15;

(b) HKO will update relevant staff notice to reflect the current practice that suits the latest operational circumstances (see para. 2.8);

(c) in 2025, Hong Kong experienced unprecedentedly frequent numbers of extreme weather events, imposing high pressure and workload on HKO staff, in particular SO grade officers who needed to ensure smooth operations of various systems and to support various HKO's weather services during inclement weather. While weather conference is a good

practice to facilitate idea exchange among forecasters, attendance of weather conference is not the only means to achieve the above purpose. HKO will take due consideration of various factors including the workload of SO grade officers to encourage them to improve the attendance in weather conferences as far as practicable;

(d) sufficient data covering different seasons and weather scenarios is needed to evaluate the performance of the potential new service on extension of forecast period before launch. HKO will evaluate the performance in the near to medium term to formulate a full implementation schedule; and

(e) HKO has been actively adopting latest technologies including AI in operations. As one of the three Regional Specialized Meteorological Centres for Nowcasting of the World Meteorological Organization, HKO pioneered development of nowcasting techniques with international recognition. Besides, HKO has been actively adopting AI models to support forecast operations. HKO will continue to adopt latest forecasting technologies to enhance forecasting capabilities.

Dissemination of weather information and issuance of warnings

2.19 According to HKO, it keeps a close watch on the changing weather situation and issues weather information and warnings to the public, including:

(a) ***Weather reports.*** HKO issues various weather reports to the public, such as Current Weather Report;

(b) ***Weather forecasts.*** HKO issues various weather forecasts to the public, such as public weather forecast, 9-day Weather Forecast and Ultraviolet Index Forecast;

(c) ***Tropical Cyclone Warnings.*** These warning bulletins are issued at hourly intervals once the Tropical Cyclone Warning Signal No. 1 or a higher signal is issued. The warning bulletins contain information on the location and movement of the tropical cyclone, its intensity and the likely effects on Hong Kong. Advice to the public on the precautions to be taken is also given; and

(d) ***Warnings of other meteorological hazards.*** These warnings include, for example, Rainstorm Warning, Thunderstorm Warning, Cold Weather Warning and Very Hot Weather Warning.

Need to enhance public's understanding of the tropical cyclone warning system

2.20 Since 2007, HKO has made reference to the wind speed data registered from a network of eight near-sea level reference anemometers covering the whole of Hong Kong when considering the issuance of Tropical Cyclone Warning Signal Nos. 3 and 8 (Note 9). Figure 2 shows the network of the eight reference anemometers as at 31 October 2025. Audit noted that HKO had conducted reviews of the network of the eight reference anemometers from time to time, and reviewed the deployment of reference anemometers, as follows:

(a) starting from 2013, Lau Fau Shan anemometer had replaced the nearby Wetland Park anemometer as 1 of the 8 reference anemometers (Note 10); and

(b) since 2024, the anemometer at Chek Lap Kok had been relocated from the Centre Runway to the North Runway of HKIA (Note 11).

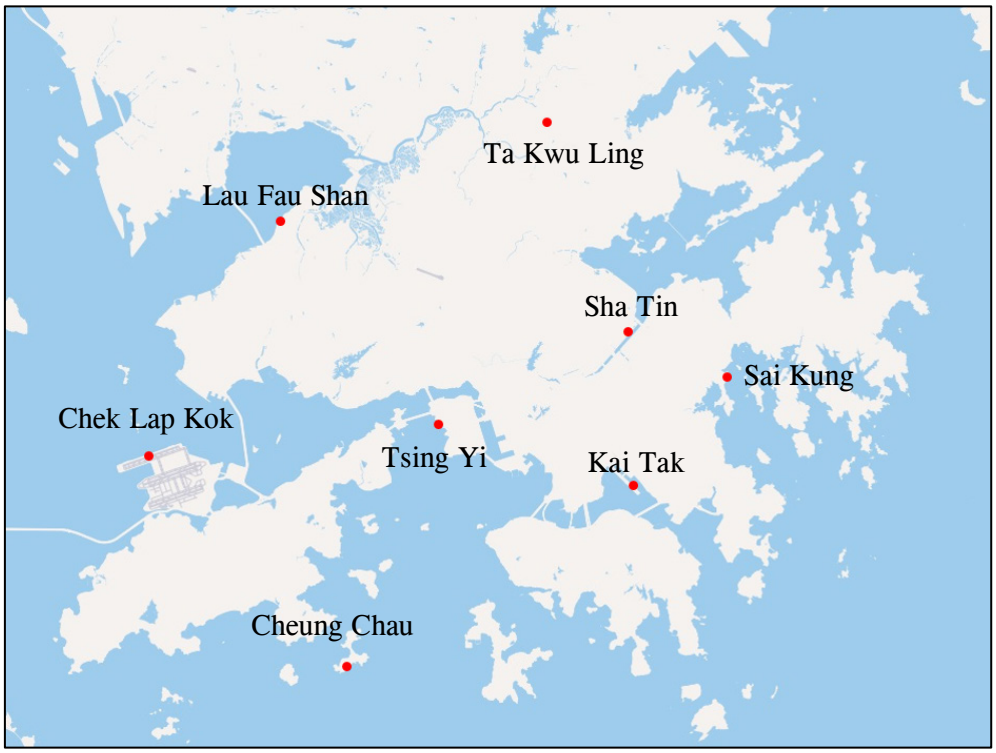
Note 9: *Before 2007, wind speed data registered in the Victoria Harbour served as the sole reference for the issuance of Tropical Cyclone Warning Signal Nos. 3 and 8.*

Note 10: *According to HKO, while the Wetland Park anemometer had been working properly since its launch in November 2005, it was replaced because the wind speed registered by the Wetland Park anemometer had been decreasing due to the influence of its changing surrounding environment including construction of new buildings nearby.*

Note 11: *According to HKO, the anemometer was relocated in view of the construction of the Three Runway System at HKIA.*

Figure 2

Network of the eight reference anemometers under the tropical cyclone warning system (31 October 2025)



Source: *HKO records*

2.21 According to the information published on HKO's website:

(a) ***Tropical Cyclone Warning Signal No. 1.*** When Tropical Cyclone Warning Signal No. 1 is issued, a tropical cyclone is centred within about 800 kilometres of Hong Kong and may affect the territory;

(b) ***Tropical Cyclone Warning Signal No. 3.*** When Tropical Cyclone Warning Signal No. 3 is issued, strong wind is blowing or expected to blow generally in Hong Kong near sea level, with a sustained speed of 41-62 kilometres per hour (km/h), and gusts which may exceed 110 km/h, and the wind condition is expected to persist;

(c) ***Tropical Cyclone Warning Signal No. 8.*** When Tropical Cyclone Warning Signal No. 8 is issued, gale or storm force wind is blowing or expected to blow generally in Hong Kong near sea level, with a sustained wind speed of 63-117 km/h from the quarter indicated and gusts which may exceed 180 km/h, and the wind condition is expected to persist;

(d) ***Tropical Cyclone Warning Signal No. 9.*** When Tropical Cyclone Warning Signal No. 9 is issued, gale or storm force wind is increasing or expected to increase significantly in strength; and

(e) ***Tropical Cyclone Warning Signal No. 10.*** When Tropical Cyclone Warning Signal No. 10 is issued, hurricane force wind is blowing or expected to blow with sustained speed reaching 118 km/h or above and gusts that may exceed 220 km/h.

2.22 The issuance of Tropical Cyclone Warning Signals is a matter of public concerns. Audit noted that, from time to time, HKO received public enquiries on the issuance of Tropical Cyclone Warning Signals. According to HKO:

(a) the Tropical Cyclone Warning Signals issued are based on scientific principles, the actual weather observations and forecasts, as well as the impact of a tropical cyclone on Hong Kong, which depends on many factors, including its circulation size, wind structure, direction and speed of movement, and distance from Hong Kong;

(b) extreme weather events have been becoming more frequent in the light of climate change. To enable better preparation and response against extreme weather, there had been increasing public demand on being notified of signal change well in advance over the years;

(c) in 2022, the United Nations Secretary-General launched the Early Warnings for All initiative to ensure that everyone on Earth is protected from hazardous weather, water, or climate events through life-saving early warning systems by the end of 2027. Along this principle, the World Meteorological Organization is championing National Meteorological and Hydrological Services to issue "people-centred, actionable forecasts" to ensure that timely information reaches communities;

(d) in line with the United Nations' Early Warnings for All initiative, HKO, whenever feasible, disseminates information to the public as early as possible to allow more time for the public to better prepare for severe weather with a view to minimising the impact to the society. This is also in line with the Government's latest strategy of early preparation and enhanced warning against extreme weather events;

(e) the Tropical Cyclone Warning Signal is a service based on science with public safety considered as top priority, and serves as a reminder for the public to complete all necessary precautionary measures before the arrival of high winds. To enable the public to well prepare for the upcoming deterioration of weather to minimise casualties, the Tropical Cyclone Warning Signals have to be issued with lead time. Due to limitations in forecasting technology, the longer the lead time of a forecast, the higher the forecast uncertainty. Achieving a high percentage of meeting the prescribed wind force criteria should not be the only and ultimate goal of the issuance of Tropical Cyclone Warning Signals. Taking into consideration of the scientific nature of forecast uncertainty in tropical cyclone movement and speed, rapid intensification when tropical cyclones get close to land mass, complicated interactions with other weather systems such as northeast monsoon, etc., as well as the need to issue warnings with lead time, HKO has to take due consideration in upholding public safety in the operation of the Tropical Cyclone Warning Signals; and

(f) there was no fatality resulted by tropical cyclones reported in 2024 and 2025, even though there was a record-breaking number of tropical cyclones affecting Hong Kong in 2025 that issuance of the Tropical Cyclone Warning Signal No.10 was necessitated for twice.

2.23 Audit acknowledges that the impact of a tropical cyclone on Hong Kong depends on many factors, and HKO has to take due consideration in upholding public safety in the operation of the Tropical Cyclone Warning Signals. In Audit's view, HKO needs to take measures to enhance public's understanding of the tropical cyclone warning system, including:

(a) publishing more comprehensive information on HKO's website in relation to the issuance of Tropical Cyclone Warning Signals (e.g. factors that would be taken into consideration when making the decisions); and

(b) stepping up relevant public education and publicity work.

Scope for reviewing the rainstorm warning system

2.24 On the morning of 8 May 1992, HKO recorded some 110 millimetres of rainfall in an hour that set the highest hourly rainfall record at that time. There were serious flooding and landslips in places on that day while the traffic in various districts was paralysed. This rainstorm led to the establishment of the rainstorm warning system (i.e. Amber, Red and Black Rainstorm Warning Signals), which aims to reflect objectively the impact of heavy rain on the society.

2.25 Currently, data of over 100 rain gauges located at different parts of Hong Kong are used by HKO to determine whether or not to issue a Rainstorm Warning Signal, and the distribution of rain gauges is denser in areas of higher risk of flooding and landslips and higher population density. According to HKO:

(a) there were public concerns on the distribution of rain gauges over years. With a view to analysing how multi-hazard risk factors might be incorporated into the rainstorm warning system to enhance the warning system from the impact-based perspective, HKO completed a study (the "First Study") in December 2025 to review the distribution of rain gauges to find out the optimal setup to reflect the risk or impact associated with the population density;

(b) the First Study revealed that rain gauges used in determining the issuance of a Rainstorm Warning Signal could be fine-tuned in a multi-hazard risk approach; and

(c) based on the findings of the First Study, it would carry out further study (the "Second Study") in 2026 (which would be based on past cases, service perspective and impact on existing forecasting tools) to draw a recommendation on the improvement measures for the rainstorm warning system for further deliberation.

2.26 In Audit's view, HKO needs to set a timetable in conducting and completing the Second Study relating to the rainstorm warning system, and take improvement measures based on the study results where appropriate.

Need to monitor the usage of various weather information and warning dissemination channels by the public

2.27 HKO disseminates weather information and warnings on hazardous weather to the public through various channels, including HKO's website, the mobile application "MyObservatory", the 1878 200 Dial-a-Weather system, press, radio, television and chatbot service "Dr Tin" (Note 12).

2.28 Audit noted that the usage of one of these dissemination channels (i.e. the 1878 200 Dial-a-Weather system) showed a decreasing trend over the years. The number of calls answered by the 1878 200 Dial-a-Weather system per year decreased from 5.1 million calls in 2021 to 3.7 million calls in 2025, representing a decrease by 27% or 1.4 million calls (Note 13).

2.29 According to HKO:

(a) with the popularisation of smartphones in recent years, the public can obtain weather information by smartphone through the mobile application "MyObservatory" in addition to the 1878 200 Dial-a-Weather system. However, HKO appreciates that many users still use the 1878 200 Dial-a-Weather system. For example, it is more convenient for some elderly or people with visual impairment to use the system than mobile applications to check weather information; and

(b) the decline in the usage of the 1878 200 Dial-a-Weather system has been recognised by HKO and it would continue to take care of the public in need to provide the service. HKO planned to update the system with voice-recognition function.

Note 12: *According to HKO, it launched the chatbot service "Dr Tin" on HKO's website and the mobile application "MyObservatory" in 2020, which employs AI to automatically answer a series of weather and astronomy related questions such as current weather and weather warnings.*

Note 13: *According to HKO, the 1878 200 Dial-a-Weather system was maintained jointly by HKO and its contractors. The annual costs of contractor services from 2021 to 2025 were $631,500, $366,220, $465,545, $404,479 and $406,149 respectively.*

2.30 In Audit's view, HKO needs to continue to monitor the usage of all weather information and warning dissemination channels by the public holistically, having regard to the specific needs of different groups of users, such as the elderly, as well as the demand for such services as reflected by the actual number of users of each information dissemination channel.

Scope for monitoring of dissemination system

2.31 The Meteorological Information Dissemination System is a system developed in-house by HKO for the preparation of weather warnings, forecasts and reports for onward dissemination to downstream systems and users. On 12 October 2025, an internal message queue error happened on one of the Meteorological Information Dissemination System application servers. The error affected the dissemination of two weather bulletins to the public on various dissemination channels (including HKO's website and the mobile application "MyObservatory") from 14:20 to 16:07 on that day. The dissemination of weather information resumed normal at 16:07 on the same day after switching the operations to a recovery site.

2.32 According to HKO:

(a) it was the first time that the application server experienced such kind of error in the message queue;

(b) arrangement has been made to capture information for diagnosis should the same problem occur in the future; and

(c) drills on contingency procedures would be arranged every quarter followed by evaluation.

2.33 In Audit's view, HKO needs to draw lessons from the system error incident and take measures to minimise the interruptions to the dissemination of weather information.

Audit recommendations

2.34 **Audit has *recommended* that the Director of the Hong Kong Observatory should:**

(a) **take measures to enhance public's understanding of the tropical cyclone warning system, including:**

(i) **publishing more comprehensive information on HKO's website in relation to the issuance of Tropical Cyclone Warning Signals (e.g. factors that would be taken into consideration when making the decisions); and**

(ii) **stepping up relevant public education and publicity work;**

(b) **set a timetable in conducting and completing the Second Study relating to the rainstorm warning system, and take improvement measures based on the study results where appropriate;**

(c) **continue to monitor the usage of all weather information and warning dissemination channels by the public holistically, having regard to the specific needs of different groups of users, such as the elderly, as well as the demand for such services as reflected by the actual number of users of each information dissemination channel; and**

(d) **draw lessons from the system error incident and take measures to minimise the interruptions to the dissemination of weather information.**

Response from the Government

2.35 The Director of the Hong Kong Observatory generally agrees with the audit recommendations. He has said that HKO will:

(a) continue to enhance public's understanding of the tropical cyclone warning system and factors on the issuance of Tropical Cyclone Warning Signals by publishing more information through publishing relevant materials such as educational videos (see para. 4.5), weather notes, etc., on HKO's website,

and will further step up relevant public education and publicity, including conducting training courses, lectures and seminars, disseminating educational information on website and social media platforms, etc.;

(b) set a timetable in conducting the Second Study and take improvement measures based on the study results as appropriate;

(c) continue to, on a quarterly basis, monitor the usage and demand of services having regard to the specific needs of different groups of users; and

(d) continue to implement additional measures with a view to preventing similar incidents (see para. 2.31) from recurring in the future.

Maintenance of meteorological and geophysical equipment/systems

2.36 To monitor and forecast weather, as well as to monitor radiation levels and tide levels in Hong Kong, HKO relies on the support of up-to-date meteorological and geophysical equipment/systems (e.g. temperature sensors, rain gauges, anemometers, radars and tide gauges). The Aviation Weather Services Branch and the Radiation Monitoring Assessment Branch are responsible for performing in-house preventive maintenance and corrective maintenance of meteorological and geophysical equipment/systems. In addition, the preventive maintenance and corrective maintenance of the electrical and mechanical part of some of these meteorological and geophysical equipment/systems was contracted out to the Electrical and Mechanical Services Trading Fund (EMSTF — Note 14).

Note 14: *According to HKO: (a) the maintenance of the sensors and instruments of meteorological and geophysical equipment/systems are covered by HKO in-house maintenance teams; and (b) since HKO staff do not have the relevant expertise (e.g. Registered Electrical Workers, in working at heights) to perform preventive maintenance and corrective maintenance of the electrical and mechanical part of meteorological and geophysical equipment/systems, such work was contracted out to EMSTF.*

Need to enhance the monitoring of in-house preventive maintenance of meteorological and geophysical equipment/systems

2.37 As at 31 December 2025, meteorological and geophysical equipment/systems were installed at 157 HKO stations (e.g. AWSs, radar stations, radiation monitoring stations and tide stations) at various locations in Hong Kong. According to HKO:

(a) for each piece of meteorological and geophysical equipment/system, preventive maintenance should be conducted according to the targeted preventive maintenance frequency (i.e. weekly, monthly, bi-monthly, quarterly, half-yearly, yearly or every 18 months);

(b) some HKO stations comprise multiple equipment/systems. As such, in-house preventive maintenance visits are planned ahead to ensure that all meteorological and geophysical equipment/systems are inspected/calibrated according to their targeted preventive maintenance frequencies; and

(c) for each in-house preventive maintenance visit, observations, actions taken during the visit and follow-up actions required (if any) are recorded in the individual maintenance report down to the equipment/system level.

2.38 Regarding the in-house preventive maintenance of meteorological and geophysical equipment/systems, Audit noted that:

(a) for HKO stations managed under HKO's quality management systems (Note 15), management summary of in-house preventive maintenance was regularly compiled for monitoring whether preventive maintenance was conducted according to the targeted preventive maintenance frequency at equipment/system level. For 2025, 80 of the 157 HKO stations were managed under HKO's quality management systems, and all meteorological and geophysical equipment/systems installed at these HKO stations were

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Note 15: *According to HKO, it had been certified to "ISO 9001:2015 Quality Management Systems" by the International Organization for Standardization, a globally recognised standard for quality management, for certain areas of services (e.g. public weather services, aviation weather services, and radiation and meteorological measurement services).*

inspected/calibrated according to their targeted preventive maintenance frequencies during the period; and

(b) for the other 77 HKO stations not managed under HKO's quality management systems, while HKO prepared and maintained individual maintenance reports down to the equipment/system level (see para. 2.37(c)), HKO did not compile regular management summary on the related in-house preventive maintenance records. Therefore, Audit was not able to readily ascertain whether preventive maintenance was conducted for every piece of meteorological and geophysical equipment/systems installed at these HKO stations according to their targeted preventive maintenance frequencies.

2.39 In Audit's view, HKO needs to take measures to enhance the monitoring of in-house preventive maintenance with a view to ensuring that preventive maintenance is conducted for every piece of meteorological and geophysical equipment/systems according to their targeted preventive maintenance frequencies, including:

(a) compiling regular management summary on preventive maintenance records for meteorological and geophysical equipment/systems not managed under HKO's quality management systems (matching the existing summary compilation standard already established for equipment/systems managed under HKO's quality management systems) for monitoring purpose; and

(b) taking follow-up actions on non-compliant cases where appropriate.

Need to enhance the monitoring of in-house corrective maintenance of meteorological and geophysical equipment/systems

2.40 For meteorological and geophysical equipment/systems installed at the 157 HKO stations, HKO is also responsible for performing in-house corrective maintenance for meteorological and geophysical equipment/systems in case of equipment/system failure/faults. According to HKO:

(a) it remotely monitors the status of equipment/systems during its daily routine to promptly identify issues which require corrective maintenance;

(b) for each equipment/system failure/faults experienced, fault rectification actions taken during in-house corrective maintenance are recorded in the individual maintenance report down to the equipment/system level; and

(c) response time to report failure/faults is stipulated in the emergency duty rosters for in-house maintenance teams. Furthermore, most HKO stations have backup stations or standby equipment to ensure continuous support to its operation. Those backup stations or standby equipment allow corrective maintenance to be completed according to priority based on resource availability.

2.41 Audit noted that:

(a) while HKO prepared and maintained individual maintenance report down to the equipment/system level (see para. 2.40(b)), HKO did not compile regular management summary on the equipment/system failure/faults experienced, response time to attend failure/faults, and the respective corrective maintenance records (e.g. fault rectification actions and time taken to complete corrective maintenance); and

(b) while HKO stipulated the response time to report failure/faults (see para. 2.40(c)), it did not set target timeframes for its in-house maintenance teams to attend the equipment/system failure/faults at the HKO stations concerned and to complete the respective corrective maintenance.

2.42 In Audit's view, HKO needs to take measures to enhance the monitoring of in-house corrective maintenance of meteorological and geophysical equipment/systems, including:

(a) compiling regular management summary on the equipment/system failure/faults experienced and the respective corrective maintenance records (e.g. fault rectification actions and time taken to complete corrective maintenance) (in addition to the existing practice of maintaining individual maintenance reports) for monitoring purpose; and

(b) considering setting target timeframes for the HKO in-house maintenance teams to attend equipment/system failure/faults at the HKO stations

concerned and to complete the respective corrective maintenance, where appropriate, taking into account factors such as resilience levels and backup plans.

Need to strengthen the monitoring of EMSTF's work in maintenance of equipment/systems

2.43 According to HKO, the preventive maintenance and corrective maintenance of the electrical and mechanical part of meteorological and geophysical equipment/systems installed at 74 of the 157 HKO stations were contracted out to EMSTF under a Service Level Agreement (SLA). As at 31 December 2025, the prevailing SLA covered the period from 1 October 2022 to 30 September 2027. For 2024-25, the SLA annual fee paid to EMSTF was $20.4 million (Note 16). According to SLA, the scope of services includes, among others, the provision of operation and maintenance of the electrical and mechanical part of aviation related and non-aviation related meteorological and geophysical equipment/systems, as follows:

(a) ***Preventive maintenance and corrective maintenance.*** EMSTF conducts preventive maintenance (including routine servicing and overhaul) according to the required preventive maintenance frequency, and responds to failure/faults and carries out subsequent corrective maintenance as necessary according to the agreed time targets on meteorological and geophysical equipment/systems;

(b) ***Regular performance reports.*** EMSTF submits regular performance reports (i.e. quarterly reports for aviation related equipment/systems and yearly reports for non-aviation related equipment/systems) to HKO on the actual performance compared against specified targets; and

(c) ***Regular performance review meetings.*** Regular performance review meetings (i.e. quarterly meetings for aviation related equipment/systems and half-yearly meetings for non-aviation related equipment/systems) are

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Note 16: *The SLA annual fee paid to EMSTF is reviewed and adjusted in each financial year, taking into account the variation in equipment quantities, systems, support services, and cost inflation/deflation of staff, labour, material and contractor services.*

held between HKO and EMSTF to review the service performance of EMSTF.

2.44 Audit noted that there was scope for improvement in the monitoring of EMSTF's work in maintenance of equipment/systems, as follows:

(a) ***Lack of consolidated management summary on preventive maintenance and corrective maintenance conducted by EMSTF for non-aviation related equipment/systems.*** For aviation related equipment/systems, EMSTF compiled regular consolidated management summary on preventive maintenance and corrective maintenance in the quarterly reports to HKO. However, for non-aviation related equipment/systems, HKO did not require EMSTF to provide consolidated management summary on its service performance, where preventive maintenance and corrective maintenance were conducted individually at stations scattered across different locations. As such, HKO was not able to ascertain whether EMSTF had:

(i) regularly maintained the electrical and mechanical part of non-aviation related equipment/system according to the required preventive maintenance frequency; and

(ii) attended and rectified equipment/system failure/faults of the electrical and mechanical part of non-aviation related equipment/systems according to the agreed time targets; and

(b) ***No record showing regular performance review meetings had been held for non-aviation related equipment/systems.*** While HKO maintained records on regular performance review meetings between HKO and EMSTF for aviation related equipment/systems to review the related service performance of EMSTF, as far as could be ascertained, no record was available showing that regular performance review meetings had been held for non-aviation related equipment/systems to review the related service performance of EMSTF.

2.45 In Audit's view, HKO needs to strengthen the monitoring of EMSTF's work in maintenance of the electrical and mechanical part of meteorological and geophysical equipment/systems, including:

(a) requiring EMSTF to compile regular consolidated management summary on preventive maintenance, and equipment/system failure/faults experienced and the respective corrective maintenance for non-aviation related equipment/systems for monitoring purpose; and

(b) holding regular performance review meetings with EMSTF in accordance with SLA to review service performance of EMSTF in maintenance of non-aviation related equipment/systems.

Audit recommendations

2.46 **Audit has *recommended* that the Director of the Hong Kong Observatory should:**

(a) **take measures to enhance the monitoring of in-house preventive maintenance with a view to ensuring that preventive maintenance is conducted for every piece of meteorological and geophysical equipment/systems according to their targeted preventive maintenance frequencies, including:**

(i) **compiling regular management summary on preventive maintenance records for meteorological and geophysical equipment/systems not managed under HKO's quality management systems (matching the existing summary compilation standard already established for equipment/systems managed under HKO's quality management systems) for monitoring purpose; and**

(ii) **taking follow-up actions on non-compliant cases where appropriate;**

(b) **take measures to enhance the monitoring of in-house corrective maintenance of meteorological and geophysical equipment/systems, including:**

(i) **compiling regular management summary on the equipment/system failure/faults experienced and the respective corrective maintenance records (e.g. fault rectification actions**

and time taken to complete corrective maintenance) (in addition to the existing practice of maintaining individual maintenance reports) for monitoring purpose; and

(ii) **considering setting target timeframes for the HKO in-house maintenance teams to attend equipment/system failure/faults at the HKO stations concerned and to complete the respective corrective maintenance, where appropriate, taking into account factors such as resilience levels and backup plans; and**

(c) **strengthen the monitoring of EMSTF's work in maintenance of the electrical and mechanical part of meteorological and geophysical equipment/systems, including:**

(i) **requiring EMSTF to compile regular consolidated management summary on preventive maintenance, and equipment/system failure/faults experienced and the respective corrective maintenance for non-aviation related equipment/systems for monitoring purpose; and**

(ii) **holding regular performance review meetings with EMSTF in accordance with SLA to review service performance of EMSTF in maintenance of non-aviation related equipment/systems.**

Response from the Government

2.47 The Director of the Hong Kong Observatory agrees with the audit recommendations. He has said that HKO will:

(a) enhance the monitoring of in-house preventive maintenance for meteorological and geophysical equipment/systems, including drawing on the existing summary compilation practices established for equipment/systems managed under HKO's quality management systems to compile regular management summary on preventive maintenance for equipment/systems not yet managed under HKO's quality management systems, and taking follow-up actions on non-compliant cases where appropriate;

(b) enhance the monitoring of in-house corrective maintenance for meteorological and geophysical equipment/systems, including compiling regular management summary on the equipment/system failure/faults and the respective corrective maintenance records in addition to the existing practice of maintaining individual maintenance reports, and considering setting target timeframes for the maintenance services of in-house maintenance teams where appropriate; and

(c) strengthen the monitoring of EMSTF's work in maintenance of the electrical and mechanical part of non-aviation related meteorological and geophysical equipment/systems, including requiring EMSTF to compile regular consolidated management summary and conducting regular performance review meetings to review service performance of EMSTF.

PART 3: PROCUREMENT AND STORES MANAGEMENT

3.1 This PART examines the procurement and stores management of HKO, focusing on:

(a) procurement of goods and services (paras. 3.3 to 3.26);

(b) management of stores (paras. 3.27 to 3.35); and

(c) monitoring of projects for procurement of computer systems and equipment (paras. 3.36 to 3.42).

Procurement and stores management

3.2 Similar to other government bureaux/departments (B/Ds), HKO's procurement activities and management of stores are governed by the Stores and Procurement Regulations (SPRs — Note 17), relevant Financial Circulars, and the circulars and guidelines issued by the Government Logistics Department (GLD — Note 18). In addition, HKO has set out its policy and procedures for procurement of stores and services and management of stores in its departmental guidelines (Note 19) and staff notices. Table 3 shows HKO's expenditure on procurement of goods and services from 2020-21 to 2025-26 (up to October 2025).

Note 17: *SPRs, made by the Financial Secretary/Secretary for Financial Services and the Treasury under the Public Finance Ordinance (Cap. 2), are supplemented by Financial Circulars, Financial Services and the Treasury Bureau Circular Memoranda, and Government Logistics Department Circulars and Circular Memoranda, which are of equal application and force as SPRs. The Regulations, Circulars and Memoranda apply to all public officers except in so far as they are inconsistent with any enactment.*

Note 18: *GLD is the Government's central procurement agent for procurement of stores with a value beyond the departmental limit (i.e. $10 million).*

Note 19: *The Guidelines for Procurement of Stores and Services of HKO set out the arrangements in various aspects of the procurement system of HKO. According to the Guidelines, they should be read in conjunction with SPRs and other related circulars, guidelines and instructions issued by various authorities.*

Table 3

HKO's expenditure on procurement of goods and services (2020-21 to 2025-26 (up to October 2025))

Type	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26 (up to October 2025)
	($ million)					
GRA expenditure						
Recurrent:						
Departmental expenses (a)	128.7	123.6	128.1	146.6	155.5	59.9
Capital:						
Minor plant, vehicles and equipment (block vote) (b)	38.1	21.5	17.4	23.7	19.1	7.5
Others:						
Funding from other B/Ds (Note 1) (c)	7.5	7.7	2.6	10.7	18.5	3.9
Sub-total (d)=(a)+(b)+(c)	174.3	152.8	148.1	181.0	193.1	71.3
CWRF expenditure (Note 2)						
Major systems and equipment (e)	9.8	30.4	35.1	99.3 (Note 3)	56.7	3.6
Computerisation (f)	45.7	36.8	50.4	48.0	69.7	21.1
Sub-total (g)=(e)+(f)	55.5	67.2	85.5	147.3	126.4	24.7
Total (h)=(d)+(g)	229.8	220.0	233.6	328.3	319.5	96.0

Source: *HKO records*

Note 1: *According to HKO, funding for procurement of goods and services was also obtained under: (a) the TechConnect (block vote), which provides funding support to B/Ds for implementing projects costing above $200,000 but not exceeding $10 million each with a view to improving the quality, efficiency or effectiveness of public services by the adoption of technology or to making use of technology to improve operations that will bring benefits to members of the public; and (b) the additional funding from the Environment and Ecology Bureau in 2023-24 and 2024-25.*

Table 3 (Cont'd)

Note 2: *CWRF Head 708 (Capital Subventions and Major Systems and Equipment) provides funding for non-administrative computer systems and communication equipment which cost more than $10 million and which are not an integral part of a works project funded under other CWRF subheads, and CWRF Head 710 (Computerisation) provides funding for administrative computer systems and consultancies for feasibility studies and system development. In addition, Subhead A007GX (New administrative computer systems) is a block allocation subhead under CWRF Head 710 for administrative computer systems and consultancies for feasibility studies and system development each costing between $200,001 and $20 million.*

Note 3: *According to HKO, the increase in CWRF expenditure in 2023-24 was due to the major payments made for procurement of major systems and equipment in the year (i.e. a high performance computer system, and the storm-detecting weather radar at Tai Mo Shan).*

Procurement of goods and services

3.3 According to SPRs, the policy of government procurement is to obtain stores and services at the best value for money in a publicly accountable manner to support Government's programmes and activities, and is underpinned by four principles, namely open and fair competition, transparency, pro-innovation and integrity.

3.4 According to HKO guidelines, procurement of stores, services and revenue contracts shall follow the procedures stipulated in SPRs (Note 20). In general:

(a) ***Procurement by quotation.*** For purchases with a value not exceeding $50,000 (Note 21), public officers concerned should normally invite more than one supplier/service provider for quotations. For direct procurement

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Note 20: *According to HKO guidelines, procurement of services for construction and engineering works, and revenue contracts for the sale of goods that will be handled by GLD are excluded for the purpose of the guidelines.*

Note 21: *According to HKO guidelines, public officers may make minor purchases of stores and services to meet: (a) immediate needs provided that the total value of the purchase does not exceed $5,000 each and the authorising officer is satisfied that such purchases are essential and the rates obtained are reasonable and certifies this on file; and (b) departmental needs while on official visits outside Hong Kong provided that the total value of the purchase does not exceed $25,000 each and the authorising officer is satisfied that such purchases are essential and the rates obtained are reasonable and certifies this on file.*

with a value over $50,000 but not exceeding the quotation limit set out in SPRs (Note 22), the procurement activities are centralised at the Supplies Section of Administration Services under the Development, Research and Administration Branch of HKO and at least five written quotations must be invited (unless it is not possible to invite no less than five written quotations or it is justified to invite less than five written quotations). For procurement by quotation, the acceptance of an offer can only be approved by a public officer of Supplies Officer Grade/Executive Officer Grade/Directorate Grade at a rank (or equivalent) with the required approving authority for the value of the purchase; and

(b) ***Procurement by tendering.*** For procurement with a value exceeding the quotation limit, it should be conducted by way of open tendering for which all interested tenderers are free to submit their tenders (Note 23). For each tender exercise within the departmental limit set out in SPRs (i.e. $10 million for non-works contracts), a Tender Assessment Panel, which is chaired by a Senior SO/Principal Experimental Officer (or equivalent), has to be set up to conduct tender evaluation. Upon completion of tender evaluation, the Tender Assessment Panel shall prepare a tender report containing a clear recommendation for consideration by a Departmental Tender Committee (DTC), which is chaired by an Assistant Director. DTC would decide or give advice on the acceptance of tenders. Procurements of stores with a value exceeding the departmental limit are handled through tender exercises arranged by GLD as the procurement agent.

Note 22: *According to SPRs, the quotation limit for procurement of stores and services was $1.4 million from 1 January 2018 to 31 December 2023, and $1.36 million from 1 January 2024 to 31 December 2025. With effect from 1 January 2026, the limit was adjusted to $1.35 million.*

Note 23: *According to HKO guidelines, under special circumstances and where approval from the concerned authorities has been obtained, user sections may invite tenders by way of single/restricted tendering or make procurement by way of direct engagement.*

3.5 From 2020-21 to 2025-26 (up to October 2025), HKO made:

(a) 15,153 purchases of goods or services by quotation (with contract values totalling $516.9 million), of which 1,058 purchases (with contract values totalling $393.1 million) were with a value over $50,000; and

(b) 26 purchases of goods or services by tendering (with contract values totalling $384.2 million), of which 3 purchases (with contract values totalling $252.3 million) were handled through tender exercises arranged by GLD.

Need to conduct analysis on the feedback received from the suppliers

3.6 According to SPRs:

(a) competition is a reliable safeguard against bidders overcharging and holding Government to ransom. By encouraging participation through open and fair competition, the Government will be better able to obtain responsive and competitive bids that ensure value for money; and

(b) for procurements with limited competition in past exercises, B/Ds should explore measures to enhance competition and satisfy themselves that the tendering or consultants selection strategy to attract new bidders and innovative proposals is effective.

3.7 Audit examined the procurement of goods and services made by HKO from 2020-21 to 2025-26 (up to October 2025) and noted that:

(a) of the 1,058 purchases by quotation with a value over $50,000:

(i) 272 purchases were made by single quotation with justifications (e.g. purchases from a sole agent or supplier) approved by the approving authority; and

(ii) while at least five written invitations for quotations were issued in the remaining 786 purchases, only 1 offer was received in 478 (61% of 786) purchases, and 2 to 4 offers were received in 284 (36% of 786) purchases; and

(b) of the 23 (i.e. 26 minus 3) purchases by tendering with tender exercises conducted by HKO:

(i) 2 purchases were made by single tendering with justifications (e.g. purchases from a sole agent or supplier) approved by the approving authority; and

(ii) while open tendering was adopted in the remaining 21 purchases, only 1 tender was received in 10 (48% of 21) purchases, and 2 to 20 tenders were received in 11 (52% of 21) purchases.

According to HKO, its operation involves highly specialised technical requirements and niche expertise, and the numbers of qualified service providers and suppliers in the market are limited.

3.8 Audit further noted that, for purchases by quotation with a value over $50,000, questionnaires were issued by HKO together with the quotation documents to the suppliers in each quotation exercise, requesting them to provide feedback on the reasons for not submitting quotations. According to HKO, it had reviewed the feedback received and taken appropriate action as necessary. However, as far as could be ascertained, there was no documentation showing that HKO had conducted analysis on the feedback received. In Audit's view, HKO needs to conduct analysis on the feedback received from the suppliers to understand their reasons for not submitting quotations and take follow-up measures as appropriate, with a view to enhancing competition in procurement of goods and services.

Need to ensure timely submission of tender reports to DTC

3.9 According to SPRs, for tender exercises within the departmental limit, B/Ds should draw up their own departmental procedures for the submission of tender reports to DTC. According to HKO guidelines, to allow adequate time for DTC to examine tender submissions, the Tender Assessment Panel should submit tender reports to DTC:

(a) at least four weeks before the expiry of the validity of the recommended tender or before the intended commencement date of the contract to be awarded; and

(b) at least five clear working days prior to the meeting of DTC.

In case of a complex or urgent submission which cannot meet the deadline, the Tender Assessment Panel must state the reasons in the tender report for the delay and urgency in the tender submission.

3.10 Audit examined the tender reports of the 23 tender exercises conducted by HKO from 2020-21 to 2025-26 (up to October 2025) and noted that:

(a) 2 (9%) tender reports were submitted 16 and 22 days (i.e. less than 4 weeks) before the intended commencement date of the contract to be awarded. Besides, these 2 tender reports were submitted to DTC 1 and 2 clear working days prior to the meeting of DTC; and

(b) another 11 (48%) tender reports were submitted to DTC 1 to 4 clear working days (averaging 3 clear working days) (i.e. less than 5 clear working days) prior to the meeting of DTC.

Audit further noted that the reasons for the delay and urgency were not stated in 12 of the 13 tender reports, at variance with the requirement stipulated in HKO guidelines.

3.11 In February 2026, HKO informed Audit that:

(a) in most of the cases identified above, the delays were due to the outbreak of coronavirus disease (COVID-19) epidemic during which HKO staff encountered significant operational challenges, including limited access to physical records and communication delays, resulting in disruptions to established workflows; and

(b) due to unforeseen operational needs, especially during wet seasons when HKO staff were required to perform duties related to inclement weather, it became difficult to ensure full participation of all members of DTC.

3.12 In Audit's view, HKO needs to take measures to ensure that tender reports are timely submitted to DTC for consideration and state the reasons for the delay and urgency in the tender reports in accordance with HKO guidelines.

Scope for improvement in making procurement of services of similar nature

3.13 According to SPRs, Controlling Officers should:

(a) ensure that public officers responsible for procurement matters do not evade the financial limits set out in SPRs by dividing procurement requirements into instalments or by reducing the usual duration of contracts; and

(b) consolidate requirements of stores and services of similar nature as far as possible to achieve better economies of scale in making procurement.

3.14 Audit noted that, from March 2023 to February 2024, HKO made 7 purchases by quotation from different suppliers for the provision of network services at various locations and workplaces. The cumulative value of the 7 purchases was about $1.8 million.

3.15 In February 2026, HKO informed Audit that a number of consolidations were made as far as practicable, coming up to the 7 purchases for network services. In Audit's view, HKO needs to make continued efforts to consolidate requirements of services of similar nature as far as possible and remind its staff to comply with the requirements set out in SPRs in making procurement of services of similar nature in the future.

Need to ensure that the performance of suppliers is evaluated as required

3.16 According to SPRs:

(a) B/Ds shall devise an effective monitoring mechanism to ensure that a contractor or consultant performs to standard and complies with the terms of a contract; and

(b) for contracts with a value exceeding the quotation limits, B/Ds shall evaluate the performance of their contractors or consultants:

(i) at least once every six months until completion of the contract for contracts lasting more than one year; and

(ii) upon completion of the contract for contracts lasting a year or less.

3.17 According to HKO guidelines:

(a) upon completion of a contract for purchases within the departmental limit, subject officers of the respective contract shall complete an evaluation form provided by the Supplies Section to give feedback on the performance of suppliers; and

(b) written warnings should be issued to suppliers who have been found with non-conformance and unsatisfactory performance. If such suppliers' performance is still found unacceptable despite repeated warnings, they should be blacklisted and deleted from the supplier list.

3.18 Audit noted that:

(a) there was no consolidated management summary on the completion of evaluation forms and the written warnings issued to suppliers for HKO to monitor the completion of evaluation of suppliers' performance and cases of non-conformance and unsatisfactory performance; and

(b) from 2020-21 to 2025-26 (up to October 2025), HKO made 26 purchases (with a value exceeding the quotation limits) by tendering, including 25 contracts lasting more than one year. As at 31 October 2025, suppliers' performance was not evaluated at least once every six months for 19 (76% of 25) contracts.

In February 2026, HKO informed Audit that suppliers' performance was evaluated before processing payments (including partial payments) to the suppliers (including the 19 contracts mentioned in para. 3.18(b)). As payments could not be proceeded without proper evaluation of suppliers' performance, cases of non-conformance and unsatisfactory performance would not be overlooked.

3.19 In Audit's view, HKO needs to take measures to ensure that the performance of suppliers is evaluated in accordance with relevant guidelines, including compiling management summary on the completion of evaluation forms and the written warnings issued to suppliers to facilitate monitoring by the management.

Need to ensure that the information in returns for procurement of stores by quotation is accurate and complete

3.20 According to SPRs, for procurement of stores by quotation, B/Ds shall forward copies of their purchase orders, together with a summary return listing out purchases over $50,000 in value, to GLD at half-yearly intervals ending 31 March and 30 September respectively.

3.21 From 2020-21 to 2025-26 (up to October 2025), HKO submitted 11 summary returns (listing out purchases of stores over $50,000 in value) to GLD. Audit noted that the numbers of purchases of stores over $50,000 in value in 3 (27%) of the 11 summary returns submitted to GLD were inconsistent with those in HKO records, containing a shortfall of 1 to 4 purchases (averaging 3 purchases) in each of the 3 returns. As a result, while there were totalling 385 purchases of stores over $50,000 in value during the periods covered by the 11 summary returns in HKO records, only 377 purchases were reported to GLD (i.e. a shortfall of 8 (2%) purchases). According to HKO, in February 2026, it submitted the information regarding the 8 purchases to GLD.

3.22 In Audit's view, HKO needs to take measures to ensure that the information in returns for procurement of stores by quotation is accurate and complete.

Need to conduct a review on the procurement guidelines

3.23 As at 31 October 2025, HKO's procurement guidelines were last updated in April 2025. Audit noted that:

(a) ***Repeated purchases of the same services.*** In July 2022, GLD issued a circular requiring that the cumulative value of repeated procurements of the same stores, services or revenue contracts within 12 months does not exceed the quotation limit as set out in SPRs. However, HKO's procurement guidelines only required its staff to ensure that repeated purchases of same items of stores (i.e. without specifying services and revenue contracts) within 12 months may be made only if the cumulative value of the purchases does not exceed the quotation limit; and

(b) ***Evaluation of suppliers' performance.*** For contracts with a value exceeding the quotation limits and lasting more than one year, SPRs required B/Ds to evaluate the performance of their contractors or consultants at least once every six months until completion of the contract. However, HKO's procurement guidelines only required subject officers to complete an evaluation upon completion of a contract for purchases within the departmental limit.

3.24 While HKO's procurement guidelines stated that the guidelines should be read in conjunction with related circulars, the guidelines specifically set out the arrangements in various aspects of the procurement system of HKO (see Note 19 to para. 3.2). In Audit's view, HKO needs to conduct a review on its procurement guidelines and consider the need to incorporate further requirements into the guidelines, including the requirements on repeated purchases of the same services and revenue contracts, and the evaluation of suppliers' performance for contracts with a value exceeding the quotation limits.

Audit recommendations

3.25 **Audit has *recommended* that the Director of the Hong Kong Observatory should:**

(a) **conduct analysis on the feedback received from the suppliers to understand their reasons for not submitting quotations and take follow-up measures as appropriate, with a view to enhancing competition in procurement of goods and services;**

(b) **take measures to ensure that tender reports are timely submitted to DTC for consideration and state the reasons for the delay and urgency in the tender reports in accordance with HKO guidelines;**

(c) **make continued efforts to consolidate requirements of services of similar nature as far as possible and remind HKO staff to comply with the requirements set out in SPRs in making procurement of services of similar nature in the future;**

(d) **take measures to ensure that the performance of suppliers is evaluated in accordance with relevant guidelines, including compiling management summary on the completion of evaluation forms and the written warnings issued to suppliers to facilitate monitoring by the management;**

(e) **take measures to ensure that the information in returns for procurement of stores by quotation is accurate and complete; and**

(f) **conduct a review on HKO's procurement guidelines and consider the need to incorporate further requirements into the guidelines, including the requirements on repeated purchases of the same services and revenue contracts, and the evaluation of suppliers' performance for contracts with a value exceeding the quotation limits.**

Response from the Government

3.26 The Director of the Hong Kong Observatory agrees with the audit recommendations. He has said that HKO:

(a) has reviewed the feedback received and will further analyse suppliers' reasons for not submitting quotations, with a view to exploring measures to enhance competition in procurement of goods and services;

(b) will ensure the timely submission of tender reports and compliance with HKO guidelines;

(c) remains committed to consolidating the procurement requirements for services of similar nature as far as possible and has reminded its staff to comply with the requirements set out in SPRs in making procurement of services of similar nature;

(d) has been monitoring the performance of suppliers, and will strengthen the monitoring measures so as to ensure that their performance is evaluated in accordance with relevant guidelines;

(e) has submitted the information regarding the 8 purchases (see para. 3.21), which contribute to 2% of the number of purchases, to GLD and will take measures to ensure that the information in the returns for procurement of stores by quotation is accurate and complete; and

(f) will review and update the internal guidelines (see para. 3.23) and would promulgate the updated guidelines to its staff upon vetting by GLD.

Management of stores

3.27 According to SPRs, Controlling Officers are responsible for the general supervision and control of stores. They should:

(a) ensure the effective and efficient use of government stores to support Government's programmes and activities; and

(b) appoint a Departmental Stores Manager (DSM) to assist them in supervising all procurement and stores management matters within their purview.

Scope for improvement in the monitoring of excessive stock

3.28 According to GLD guidelines:

(a) keeping excessive stock will induce not only quality problems and financial loss such as degradation and potential obsolescence leading to the need to dispose of such stores item, but also incur unnecessary stockholding costs and tie up capital cost; and

(b) DSMs should review regularly the stock on hand with a view to identifying any excessive or dormant stores items or stores items approaching the end of their shelf-life, and arrange their possible utilisation as early as possible whenever these items are identified.

3.29 According to HKO, as at 31 December 2025, it had 18 store units, of which 10 store units adopted the Departmental Stores Ledger Posting System (i.e. a computer system provided by GLD to B/Ds for use in their store units to facilitate efficient stock management) and 8 store units used manual ledger sheets for administrative convenience having regard to the small numbers of transactions. Audit noted that there was scope for improvement in the monitoring of excessive stock by HKO, as follows:

(a) ***Need to arrange possible utilisation of the excessive stock identified.*** For the 10 store units adopting the Departmental Stores Ledger Posting System, Audit examined the Excessive Stock Report generated by the System (Note 24) and noted that, as at 31 December 2025, there were excessive stocks for 135 types of stores items (e.g. obstruction lights) in 6 of the 10 store units. In February 2026, HKO informed Audit that, of the 135 types of stores items:

Note 24: *In the Departmental Stores Ledger Posting System, items with a stock balance greater than the average annual consumption of the past 3 years would be considered as excessive.*

(i) 88 types of stores items (with a total cost of about $30,000) were supplies stores; and

(ii) 47 types of stores items (with a total cost of about $1.1 million) were spare parts critical for maintaining the operational readiness of meteorological equipment. Maintaining the stock level of these items was a proactive measure to ensure uninterrupted and continuous operations, taking into account the fact that most items were not readily available and must be sourced from specialised suppliers, and the risks of failure of meteorological instruments, which could be affected by various factors including the frequency and severity of weather conditions; and

(b) ***Need to compile regular management summary.*** For the 8 store units using manual ledger sheets, while they had small numbers of transactions and were also prone to the risk of having excessive stock, HKO did not compile any regular management summary on the stock balance and consumption of stores items for the identification of excessive or dormant stores items.

3.30 In Audit's view, HKO needs to:

(a) arrange possible utilisation of the excessive stock identified as early as practicable; and

(b) compile regular management summary to facilitate the identification of excessive or dormant stores items in the store units using manual ledger sheets.

Scope for improvement in conducting checks and inspections related to management of stores

3.31 According to SPRs, the following checks and inspections should be conducted in relation to the management of stores:

(a) ***Surprise stock and security checks.*** DSM should carry out surprise stock and security checks at irregular intervals at least once every three months unless the Director of Government Logistics has authorised otherwise. Findings of the checks should be properly recorded in the surprise inspection book; and

(b) ***Annual stock verifications.*** Controlling Officers may appoint public officers of their B/Ds to inspect and verify completely stocks of all items held on ledger charge in all stores under their control. According to the staff notices of HKO, all stock items held on ledger charge in the store units shall be thoroughly inspected and verified at least once a year, and results should be reported in the departmental stocktaking report.

3.32 As at 31 December 2025, HKO had 18 store units. Audit noted that there was scope for improvement in conducting checks and inspections related to management of stores by HKO, as follows:

(a) ***Surprise stock and security checks not conducted at irregular intervals and results not documented for some store units.*** From 2020-21 to 2025-26 (up to December 2025):

(i) the surprise stock and security checks of 4 store units were conducted regularly during the last 2 working days of every quarter during the period (i.e. not at irregular intervals as required); and

(ii) while the surprise stock and security checks were conducted for 10 store units, the numbers of items checked and the results of the checks were not documented as required; and

(b) ***Annual stock verifications conducted for two closed store units.*** In November 2022, HKO closed two store units as all the stores items had been used up. While these two store units had been closed, departmental stocktaking reports for these two store units were still completed annually in 2023, 2024 and 2025.

3.33 In Audit's view, HKO needs to take measures to ensure that the checks and inspections related to management of stores are conducted in accordance with relevant guidelines.

Audit recommendations

3.34 **Audit has *recommended* that the Director of the Hong Kong Observatory should:**

(a) **arrange possible utilisation of the excessive stock identified as early as practicable;**

(b) **compile regular management summary to facilitate the identification of excessive or dormant stores items in the store units using manual ledger sheets; and**

(c) **take measures to ensure that the checks and inspections related to management of stores are conducted in accordance with relevant guidelines.**

Response from the Government

3.35 The Director of the Hong Kong Observatory agrees with the audit recommendations. He has said that HKO will:

(a) continue to monitor the stock position with strengthened measures and arrange for utilisation of excessive stock as early as practicable; and

(b) explore ways to further enhance the management of stores, including preparing management summary to facilitate the identification of excessive or dormant stores items, if any, and reinforcing compliance with relevant guidelines on checks and inspections through staff reminders.

Monitoring of projects for procurement of computer systems and equipment

3.36 According to HKO:

(a) it is necessary to acquire its own computer systems to process the vast amount of meteorological data for operational and climatological use. It also needs to procure meteorological equipment for enhancing its capability in monitoring and predicting inclement weather in Hong Kong; and

(b) it procured computer systems and meteorological equipment under a number of projects, which were mainly funded under CWRF Head 708 and CWRF Head 710 (see Note 2 to Table 3 in para. 3.2).

From 2020-21 to 2025-26 (up to October 2025), HKO commenced 6 projects with approved project estimates (APEs) totalling $566.9 million funded under CWRF Head 708 and 34 projects with APEs totalling $282.7 million funded under CWRF Head 710.

Need to ensure timely completion of projects for procurement of computer systems and equipment

3.37 Audit noted that there were delays in completion of some projects for procurement of computer systems and equipment. As at 31 October 2025:

(a) the 6 projects funded under CWRF Head 708 (i.e. for procurement of major systems and equipment) were still in progress, of which 4 (67%) had been delayed by 10 months to 3.3 years (averaging 2 years) from the respective original target completion dates; and

(b) of the 34 projects funded under CWRF Head 710 (i.e. for procurement of administrative computer systems):

(i) 19 (56%) had been completed, of which 12 (63% of 19) were completed 1 to 10 months (averaging 4 months) after the respective original target completion dates; and

(ii) 15 (44%) were still in progress, of which 1 (7% of 15) had been delayed by 1 month from the original target completion date.

3.38 According to HKO, of the 12 projects mentioned in paragraph 3.37(b)(i), 11 were completed 1 to 7 months and 1 was completed 10 months after the respective original target completion dates. The impact to implementation schedules of these projects was mainly attributable to the prolonged COVID-19 epidemic which caused unforeseeable delay in essential network equipment delivery, restricted site access and longer time in overseas shipping for equipment. In Audit's view, HKO needs to take measures to ensure timely completion of projects for procurement of computer systems and equipment.

Scope for improvement in estimating the costs of projects for procurement of computer systems and equipment

3.39 Audit noted that there were unspent balances under the completed projects for procurement of computer systems and equipment. As at 31 October 2025:

(a) the total unspent balance of the 19 completed projects funded under CWRF Head 710 (see para. 3.37(b)(i)) was $7.3 million (i.e. 6% of their APEs); and

(b) in particular, the unspent balances of 6 (32% of 19) completed projects were 11% to 34% (averaging 16%) of the respective APEs. According to HKO, the APEs of the 6 projects each included 10% contingency funds, and the unspent balances of them were around $15,000 to $378,000 after discarding the contingency funds (i.e. 2% to 27% (averaging 8%) of the respective APEs without the contingency funds).

3.40 In Audit's view, HKO needs to make better estimates of the costs of projects for procurement of computer systems and equipment before seeking funding approval.

Audit recommendations

3.41 **Audit has *recommended* that the Director of the Hong Kong Observatory should:**

(a) **take measures to ensure timely completion of projects for procurement of computer systems and equipment; and**

(b) **make better estimates of the costs of projects for procurement of computer systems and equipment before seeking funding approval.**

Response from the Government

3.42 The Director of the Hong Kong Observatory agrees with the audit recommendations. He has said that HKO:

(a) has all along closely monitored the progress of projects for procurement of computer systems and equipment, and will continue to take measures to ensure their timely completion, especially for projects encountering issues or challenges; and

(b) will continue to make better estimates of the costs of projects for procurement of computer systems and equipment.

PART 4: OTHER ISSUES

4.1 This PART examines other issues, focusing on:

(a) public education and publicity (paras. 4.2 to 4.18); and

(b) office accommodation (paras. 4.19 to 4.33).

Public education and publicity

4.2 HKO promotes awareness of high-impact weather, impacts of climate change and its services through public education and publicity. According to HKO:

(a) annual publicity plans with inputs from relevant divisions under the four functional branches are prepared and submitted to the directorates for approval;

(b) the divisions would summarise the public education and publicity events/activities organised by HKO in their internal quarterly reports; and

(c) post-completion evaluation is conducted and/or media coverage is monitored after the public education and publicity events/activities.

Need to consider organising more educational activities for the public

4.3 HKO organises different types of educational activities for the public, such as public talks, workshops, guided tours and public courses. Audit noted that the numbers of some educational activities organised by HKO decreased in recent years (see Table 4), as follows:

(a) ***"Gamma-Go" Workshop.*** The "Gamma-Go" Workshop is an experiential activity launched by HKO in March 2021 as a new public outreach initiative to enhance students' understanding of radiation through lectures and practical sessions (Note 25). Interested schools may submit applications to HKO for organising the workshops free of charge, and the maximum capacity of each workshop is around 30. According to HKO, it organised workshops for all the schools which submitted applications from 2021 to 2025, except a couple of schools which did not accept an alternative date when the originally proposed dates of workshops were unavailable. While 24 to 29 schools successfully applied for 24 to 30 workshops annually from 2021 to 2023 (i.e. 2 to 3 workshops in 1 month on average), 13 and 14 schools successfully applied for 13 and 14 workshops in 2024 and 2025 respectively (i.e. the numbers of schools and workshops both reduced by about half from 2021 to 2023);

(b) ***Guided tours.*** HKO organises free guided tours of its Headquarters for individuals, schools and groups. Each guided tour has around 30 places. Visitors can see how weather forecasts are made and how technology is put to use. Interested parties may submit applications to HKO and select from the available dates announced by HKO to join the guided tours. From 2015 to 2019, HKO organised 111 to 139 guided tours (averaging 128 guided tours) each year and the annual numbers of visitors ranged from 3,331 to 3,820 (averaging 3,640). However, from 2023 to 2025, HKO organised 62 to 71 guided tours (averaging 68 guided tours) each year and the annual numbers of visitors ranged from 1,486 to 1,939 (averaging 1,762); and

(c) ***Public courses on weather observation.*** To provide interested members of the public with basic knowledge in weather observation and its applications, HKO organises public courses on weather observation from time to time. Each course comprised two sessions and the fee of the course organised in 2023 was $150 per person. From 2015 to 2019, HKO organised a total of four courses with a quota of around 135 seats each and each course had 127 to 137 participants (averaging 132 participants). Since then and up to December 2025, HKO only organised the course once with a quota

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Note 25: *According to HKO, after the workshops, participating schools could continue to engage in the "Gamma-Go" community through making radiation measurements and sharing data to a dedicated platform.*

of 100 seats in 2023 with 97 participants (Note 26). Audit noted that the resumption of public courses on weather observation in 2023 attracted close to 2,000 applications. In February 2026, HKO informed Audit that:

(i) to complement the suspension of on-site public courses under COVID-19 epidemic, it launched online courses on weather observation and tropical cyclone by uploading videos onto a social media platform in 2020 and 2022 respectively; and

(ii) the online courses were very well-received and the total cumulative number of views of the videos was over 300,000. These served as an alternative for those who could not join the on-site public courses.

Table 4

Numbers of workshops, guided tours and public courses organised by HKO (2021 to 2025)

Year	"Gamma-Go" Workshop	Guided tour (Note)	Public course on weather observation (Note)
2021	30	–	–
2022	24	–	–
2023	24	62	1
2024	13	70	–
2025	14	71	–
Total	105	203	1

Source: *HKO records*

Note: *According to HKO, due to the outbreak of COVID-19 epidemic: (a) guided tours were suspended from February 2020 to December 2022, and resumed in January 2023; and (b) public courses on weather observation were suspended in 2021 and 2022.*

Note 26: *According to HKO, as larger venues were not available due to refurbishment, a quota of 100 seats was set for the course organised in 2023.*

4.4 In Audit's view, HKO needs to consider organising more educational activities for the public with a view to reaching the public more to promote awareness of high-impact weather, impacts of climate change and its services.

Need to continue to review the production of educational videos

4.5 According to HKO, to enhance public's understanding on meteorology and to raise public awareness on natural disaster prevention, it has produced a programme series of educational videos known as the "Cool Met Stuff" (CMS) since January 2014. Similar to the regular weather forecasts, CMS is broadcast to the members of the public on television and via the mobile application "MyObservatory", and the videos are uploaded onto social media platforms.

4.6 CMS was launched in January 2014 and it is broadcast every Friday. As at 31 December 2025, HKO had produced 495 CMS videos. Audit noted that:

(a) ***Reduced production frequency of new videos.*** According to HKO, when CMS was launched in January 2014, one new video was produced and broadcast every week. After considering the manpower arrangement, time required for generating creative ideas for presentation, and flexibility in producing ad hoc episodes, the production frequency had been reduced from one new video every week to every two weeks on average (i.e. bi-weekly) since August 2022 (Note 27), and previously produced videos would be re-broadcast for the weeks without new videos produced;

(b) ***Numbers of views on some social media platforms not included in the annual target.*** HKO had set annual targets on the number of views of CMS videos by measuring the numbers of views on 2 social media platforms (Note 28). In this connection:

Note 27: *According to HKO, one new CMS video was produced every month from August 2021 to July 2022 due to the outbreak of COVID-19 epidemic.*

Note 28: *According to HKO, annual target was not set on the number of views of CMS videos broadcast on local television stations as the data could not be obtained.*

(i) the annual targets were met in most of the years from 2021 to 2025 (see Table 5); and

(ii) while CMS videos were uploaded onto 4 social media platforms, HKO only included the numbers of views on 2 platforms in its annual target; and

Table 5

Number of views of CMS videos on 2 social media platforms (2021 to 2025)

Year	Target number of views (a)	Actual number of views (b)	Difference (c) = (b) – (a)
2021	2,000,000	1,994,520	(5,480)
2022	1,500,000	1,726,604	226,604
2023	1,500,000	2,224,238 (Note)	724,238
2024	1,500,000	1,288,622	(211,378)
2025	1,500,000	2,032,512	532,512

Source: *HKO records*

Note: *According to HKO, the significant increase in number of views of CMS videos in 2023 was mainly due to a number of significant weather events in the third and fourth quarters of 2023.*

(c) ***Large variance in numbers of views for some CMS videos.*** The popularity of CMS videos varied. While some CMS videos were very popular, the content of some videos might not be as appealing to the audience as the other videos. For example, in 2024, HKO produced 24 CMS videos. As at 31 December 2025, the total cumulative numbers of views of the 24 videos on the 2 social media platforms included in HKO's annual targets ranged from about 10,000 to 156,000 (averaging 51,000).

4.7 In February 2026, HKO informed Audit that:

(a) previously produced videos would be re-broadcast if the content remained relevant and applicable (e.g. those related to reminders of weather hazards). With over 400 CMS videos produced up to mid-2022, the arrangement of broadcasting new and previously produced CMS videos alternately was considered a cost-effective and timely way to promulgate key messages to the public, while optimising the use of existing resources;

(b) the numbers of views of CMS videos on 2 social media platforms were not included in the annual target as these platforms were either relatively new or only focused on specific audience groups;

(c) even though the nature of some CMS topics may not appear to be interesting to the general public at first glance, the content may cover important messages (e.g. reminders of weather hazards and precautionary messages) or services which HKO needed to promulgate. The statistics and analysis of all CMS videos were presented and discussed at regular meetings, and popular videos were discussed to better understand the preferences of audience and to facilitate planning of future content; and

(d) CMS had been regularly reviewed at internal meetings, covering the production frequency, content, dissemination channels and view statistics.

4.8 In Audit's view, HKO needs to continue to review the production of CMS videos with a view to formulating further improvement measures for CMS taking into account all relevant factors (e.g. the production frequency of new videos, the formulation of annual targets on number of views, and the attractiveness of the content of videos).

Need to keep under review the arrangement of open days

4.9 According to HKO, it organises open days with different themes and the public responses were overwhelmingly positive. For example, for the open day held in March 2025, visitors learnt about HKO's efforts in leveraging the latest technology to provide various services to the public. They also gained a deeper understanding of the impacts of climate change and extreme weather.

Other issues

4.10 Audit noted that:

(a) ***Suspension of open days.*** According to HKO, the construction of the Annex Block in the existing open car park and its vicinity at the Headquarters commenced in late May 2025 and it was estimated to be completed in around 4 years (i.e. 2029) (see para. 4.21(e)). As there would be a construction site at the Headquarters, it was expected that open days would not be held until the completion of works; and

(b) ***Visitor quotas of open days.*** From 2023 to 2025, pre-registration for HKO's open days was required (i.e. visitor quotas were set) and 6,624 to 9,780 visitors (averaging 8,483 visitors) attended the open day each time. However, from 2015 to 2019, no visitor quotas were set and more than 10,000 visitors attended the open day each time.

4.11 In February 2026, HKO informed Audit that:

(a) HKO had been exploring other alternative arrangements to substitute its open days during the suspension period. For example, virtual tours would be made available to allow members of the public to visit the Headquarters online and understand more about the work of HKO; and

(b) the feedback from visitor surveys for the open days organised from 2015 to 2019 indicated issues such as overcrowding and long queueing times, suggesting that such attendance levels were not ideal for visitor experience. In recent years, visitor quotas for each open day were set to alleviate the situation. HKO had reviewed the visitor quotas as part of the planning for each open day and would continue to do so for future events.

4.12 The open day is one of the most popular activities of HKO. In Audit's view, HKO needs to keep under review the arrangement of open days, including the effectiveness of alternative arrangements during the suspension of its open days and the visitor quotas of its open days in the future with a view to better satisfying the public demand.

Low publication frequency of e-bulletins for specific stakeholders and readers

4.13 According to HKO, it publishes various e-bulletins for different stakeholders and readers, including:

(a) ***HKO e-Bulletin for the Marine Community.*** It is published online to enhance communications with mariners and provide the latest news and information on the development of weather services for the marine community; and

(b) ***HKO News Bulletin for the Aviation Community.*** It is published online to provide the latest information and development in aviation weather for the aviation community.

4.14 Audit noted that:

(a) at an internal meeting of HKO held in April 2020, the members agreed that the positioning of the HKO e-Bulletin for the Marine Community and the HKO News Bulletin for the Aviation Community could focus on specific stakeholders and readers, and their production should be continued; and

(b) from 2021 to 2025, while 5 HKO e-Bulletin for the Marine Community were published (in January 2022, October 2022, July 2023, August 2024 and December 2025), only 1 HKO News Bulletin for the Aviation Community was published (in June 2022).

4.15 In February 2026, HKO informed Audit that:

(a) the HKO e-Bulletin for the Marine Community targeted a specialised audience within the shipping community, and its frequency of publication was normally once a year. HKO would seek views from the shipping community to better align with the stakeholders' needs and expectations; and

(b) in addition to the publication of the HKO News Bulletin for the Aviation Community, it had commenced to distribute latest news for the aviation community on a social media platform since December 2021.

4.16 In Audit's view, HKO needs to continue to review the publication of e-bulletins with a view to formulating further improvement measures.

Audit recommendations

4.17 **Audit has *recommended* that the Director of the Hong Kong Observatory should:**

(a) **consider organising more educational activities for the public with a view to reaching the public more to promote awareness of high-impact weather, impacts of climate change and HKO's services;**

(b) **continue to review the production of CMS videos with a view to formulating further improvement measures for CMS taking into account all relevant factors;**

(c) **keep under review the arrangement of open days, including the effectiveness of alternative arrangements during the suspension of HKO's open days and the visitor quotas of HKO's open days in the future with a view to better satisfying the public demand; and**

(d) **continue to review the publication of e-bulletins with a view to formulating further improvement measures.**

Response from the Government

4.18 The Director of the Hong Kong Observatory agrees with the audit recommendations. He has said that HKO:

(a) has been making sustained efforts to engage the public through various educational and outreach activities. HKO will continue to explore opportunities within resources available to organise more educational activities for the public, including promoting awareness of high-impact weather, impacts of climate change and HKO's services;

(b) has been conducting regular reviews on the effectiveness of CMS and undertaking various measures over the years to enhance the effectiveness of CMS, such as adopting more creative presentation styles and elements as long as resources allow. HKO will continue its ongoing effort to review the production of CMS and explore further improvement measures as appropriate;

(c) will keep under review the arrangement of open days, including the effectiveness of alternative arrangements during the suspension period and the visitor quotas of future open days, taking into account the change in visitor capacity after the completion of the Annex Block construction and public demand; and

(d) will continue to review the publication of e-bulletins, including the frequency of publication and the contents. HKO will seek views from the shipping community on the e-Bulletin for the Marine Community and take into account their views in the review for better alignment with the stakeholders' needs and expectations. Regarding the e-bulletins for the aviation community, HKO will review and consolidate existing dissemination channels, aiming to provide a more user-friendly and seamless way of promoting its relevant activities to both the aviation community and the general public.

Office accommodation

4.19 Staff of HKO are accommodated at the Headquarters in Tsim Sha Tsui and three other offices. As at 31 October 2025, the total floor area of these four offices was about 5,817 m^2 (see Table 6).

Table 6

Office accommodation
(31 October 2025)

Office	Floor area (m^2)	Remarks
Headquarters	3,479	• Government-owned properties • Located in Tsim Sha Tsui • Comprising the 1883 Building and Annex built in 1883, the Centenary Building built in 1983, the Red House built in 1926 and the White Houses built in 1960s
Mira Place Tower Office	1,028	• Leased properties • Located in Tsim Sha Tsui near the Headquarters
Airport Meteorological Office	1,050	• Owned and provided by AAHK • Located inside the Air Traffic Control Towers at HKIA
King's Park Laboratory and Meteorological Station	260	• Government-owned properties • Located in Ho Man Tin
Total	5,817	

Source: HKO records

Need to closely monitor the works progress of the Annex Block project

4.20 According to HKO, there is a need to construct an Annex Block in the existing open car park and its vicinity at the Headquarters to provide the necessary space for developing and enhancing the services of HKO to cope with more frequent extreme weather events due to climate change, providing support for major national strategies of our country, strengthening and fostering the collaboration with the Chinese Mainland as well as regional and global cooperation, thereby consolidating HKO's position as a regional and international centre for meteorological advancements.

4.21 Audit noted that long time was taken at the planning and design stage for the Annex Block project before the commencement of construction works, as follows:

(a) in March 2010, HKO considered that there was a need to redevelop its Centenary Building or construct a new building at its Headquarters to facilitate less obstructed visibility observation and provide additional office accommodation to house the staff accommodated in the Mira Place Tower Office. In August 2010, a preliminary study on the redevelopment proposal was completed and five options were identified, including the construction of a new building;

(b) according to HKO, given that the Headquarters is one of the Centennial Observing Stations recognised by the World Meteorological Organization and a declared monument site with heritage development constraints, together with the essential need to ensure that HKO's round-the-clock critical operations within the Headquarters will not be affected, HKO adopted a prudent approach and held in-depth discussions with relevant government departments to explore and evaluate various potential development site options to minimise impacts to heritage and operations. Taking into account all relevant factors, HKO decided in March 2015 to focus on studying the technical feasibility of constructing a new building at the existing open car park;

(c) as the entire site of the Headquarters is a declared monument site and the area contains extensive natural woodland that requires proper protection, consultants and contractors were then engaged to conduct the investigations and assessments in accordance with the requirements in relevant ordinances (e.g. the Antiquities and Monuments Ordinance (Cap. 53) and the Environmental Impact Assessment Ordinance (Cap. 499));

(d) in May 2025, the Finance Committee of the Legislative Council approved the construction of a four-storey Annex Block and the related works at an APE of $634.5 million; and

(e) in the event, the works commenced in late May 2025 (i.e. about 15 years after the completion of preliminary study in August 2010) for completion in around 4 years (i.e. 2029).

Other issues

4.22 In seeking funding approval for the construction of the Annex Block in March 2025, HKO informed the Public Works Subcommittee of the Finance Committee of the Legislative Council that:

(a) if the Annex Block project could not be implemented, HKO would not be able to establish the various new operational centres (e.g. an Integrated Forecasting and Warning Centre, and a Meteorological Data and Computation Centre). This would seriously hinder the development and enhancement of forecasting systems with new technologies and render it difficult to enhance the forecasting and early warning capabilities against extreme weather, thereby affecting public safety; and

(b) the Annex Block would provide space to accommodate the increased manpower, meteorological instruments and computing systems, alleviating the severe long-standing problem of insufficient office and facility space at the Headquarters. Furthermore, the consolidation of offices located in nearby leased private properties (i.e. the Mira Place Tower Office) in the Annex Block would enhance the operational efficiency and service quality of HKO. After the commissioning of the Annex Block, HKO would no longer need to rent private properties (Note 29), resulting in an annual savings of approximately $11.3 million at the prices of the day.

4.23 Audit noted that, as the entire site of the Headquarters is a declared monument site, the construction of the Annex Block faced additional challenges and complexities as compared to typical construction projects. For example, during the construction stage:

(a) the Annex Block project would have to be carried out in compliance with the mitigation measures, recommendations and requirements as stipulated in the cultural heritage impact assessment report, including monitoring indirect vibration, settlement, or tilting impact on historic buildings; and

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Note 29: *According to HKO, the Airport Meteorological Office is located inside the Air Traffic Control Towers at HKIA and is provided by AAHK free of charge.*

(b) if any antiquities or supposed antiquities are discovered, the scope of works may need to be revised before re-commencing the works. In case of any damage caused to the declared monument, the works must be suspended immediately until the remedial actions are approved by the authority.

4.24 Given the construction difficulties of the project and importance of the Annex Block in supporting the services of HKO, in Audit's view, HKO needs to closely monitor the works progress of the Annex Block project with a view to ensuring timely commissioning of the Annex Block.

Need to keep under review the utilisation of facilities for visits by the public

4.25 According to HKO:

(a) in April 2000, it set up a Resource Centre in its Mira Place Tower Office to provide the public with the sale of souvenirs and publications, and access to different meteorological information. With the utilisation rate continued to decrease due to the popularisation of the Internet, it had converted some areas of the Resource Centre into office area to accommodate more staff and the conversion was completed in the fourth quarter of 2014. As at 31 October 2025, the Resource Centre occupied an area of 28.7 m^2 in the Mira Place Tower Office of HKO (Note 30); and

(b) apart from the Resource Centre, it also set up an Exhibition Hall of 98 m^2 in the Centenary Building in 1983 and a History Room of 26.7 m^2 in the 1883 Building in 2003 for visits by the public at its Headquarters (Note 31).

Note 30: *According to HKO, as at 31 October 2025, the total floor area of its Mira Place Tower Office was 1,028 m^2 and the latest annual rental expenditure was about $10 million.*

Note 31: *According to HKO: (a) the Exhibition Hall was set up for displaying various exhibits on themes related to the services of HKO; and (b) the History Room was set up for showing the history of HKO.*

Other issues

4.26 Audit noted that:

(a) in 2025, there were more than 10,000 visitors to the Exhibition Hall but only 217 visitors to the Resource Centre (i.e. less than 1 visitor per day on average) (see Table 7);

Table 7

Number of visitors to the Resource Centre
(2021 to 2025)

Year	Number of visitors
2021	842 (Note)
2022	351
2023	244
2024	287
2025	217
Total	1,941

Source: *HKO records*

Note: *According to HKO, the large number of visitors to the Resource Centre in 2021 was likely attributable to a campaign held in the year, where some participants of the campaign came to the Resource Centre for enquiries or collecting promotional items.*

(b) as far as could be ascertained, HKO did not compile regular management summary on the numbers of visitors to the History Room; and

(c) a Public Information and Education Concourse would be established in the new Annex Block, which would be open for public and group visits by appointment. HKO also planned to refurbish the Red House (an historic building within the Headquarters) and convert it into the new History Room.

4.27 While HKO would no longer need to rent private properties (i.e. the Mira Place Tower Office where the Resource Centre locates) after the commissioning of the Annex Block (see para. 4.22(b)), HKO will still have facilities for visits by the public (e.g. the History Room and the Public Information and Education Concourse). In Audit's view, HKO needs to keep under review the utilisation of facilities for visits by the public (e.g. compiling regular management summary) and take measures to increase the utilisation (e.g. enhancing the promotion to attract more visits by the public).

Need to ensure that prior approval is sought as required before making changes in the use of the accommodation

4.28 According to the Accommodation Regulations (Note 32):

(a) the Government Property Agency (GPA) is the approving authority for the Schedule of Accommodation (SoA) in respect of general office accommodation. The user B/D should seek GPA's prior approval before making any significant changes in the use of the accommodation (e.g. conversion of a public enquiry service centre into a storeroom);

(b) for leased accommodation, if the net operational floor area of any individual SoA item varies by more than 10% from the approved area after approval of SoA, the user B/D should re-submit its SoA to GPA or relevant authorities for further approval; and

(c) B/Ds should see if there is a continued need for all the office accommodation in government-owned and leased accommodation allocated to them once a year.

Note 32: *The Accommodation Regulations set out the policy and guiding principles on government accommodation and related matters for B/Ds.*

4.29 Audit noted that the Resource Centre in the Mira Place Tower Office of HKO was an individual SoA item. While HKO completed the conversion of part of the Resource Centre into office area in the fourth quarter of 2014 (see para. 4.25(a)), it only sought approval from GPA in February 2025 for the conversion of an area of 11.3 m^2 (i.e. 28% of the original area of 40 m^2 before the conversion) of the Resource Centre into office area. The covering approval was obtained in April 2025. In Audit's view, HKO needs to take measures to ensure that prior approval is sought as required before making changes in the use of the accommodation.

Scope for improvement in the sale of souvenirs at the Resource Centre

4.30 According to HKO, it maintained 9 types of souvenirs (e.g. pens, paperweights and umbrellas) in stock for sale to the public. The souvenirs are available for sale at the Resource Centre in the Mira Place Tower Office.

4.31 Audit noted that some souvenirs were not available at the Resource Centre for sale. As at 31 October 2025, while there were 9 types of souvenirs in stock and sufficient spaces for storing the souvenirs, only 3 (33%) types of souvenirs were available for sale at the Resource Centre. In Audit's view, HKO needs to consider displaying more types of souvenirs at the Resource Centre for sale to the public.

Audit recommendations

4.32 **Audit has *recommended* that the Director of the Hong Kong Observatory should:**

(a) **closely monitor the works progress of the Annex Block project with a view to ensuring timely commissioning of the Annex Block;**

(b) **keep under review the utilisation of facilities for visits by the public and take measures to increase the utilisation;**

(c) **take measures to ensure that prior approval is sought as required before making changes in the use of the accommodation; and**

(d) **consider displaying more types of souvenirs at the Resource Centre for sale to the public**.

Response from the Government

4.33 The Director of the Hong Kong Observatory agrees with the audit recommendations. He has said that HKO:

(a) will continue to closely monitor the works progress of the Annex Block project to ensure timely commissioning of the project;

(b) will keep under review the utilisation of facilities for visits by the public and explore measures to increase the utilisation, especially after the commissioning of the Annex Block;

(c) will ensure compliance with the Accommodation Regulations and seek prior approval for future changes as appropriate; and

(d) has displayed more types of souvenirs for sale.

Acronyms and abbreviations

AAHK	Airport Authority Hong Kong
AI	Artificial intelligence
APEs	Approved project estimates
Audit	Audit Commission
AWSs	Automatic weather stations
B/Ds	Government bureaux/departments
CMS	"Cool Met Stuff"
CWRF	Capital Works Reserve Fund
DSM	Departmental Stores Manager
DTC	Departmental Tender Committee
EMSTF	Electrical and Mechanical Services Trading Fund
GLD	Government Logistics Department
GPA	Government Property Agency
GRA	General Revenue Account
HKIA	Hong Kong International Airport
HKO	Hong Kong Observatory
km/h	kilometres per hour
m^2	square metres
SLA	Service Level Agreement
SO	Scientific Officer
SoA	Schedule of Accommodation
SPRs	Stores and Procurement Regulations