

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:

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- (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:

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- (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).

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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

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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).

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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).

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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 CWRP 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

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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).

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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));

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- (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));**

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- (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.

