

CHAPTER 4

**Transport and Logistics Bureau
Civil Aviation Department**

**Regulation of operations of
small unmanned aircraft**

**Audit Commission
Hong Kong
28 October 2024**

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.

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REGULATION OF OPERATIONS OF SMALL UNMANNED AIRCRAFT

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REGULATION OF OPERATIONS OF SMALL UNMANNED AIRCRAFT

Executive Summary

1. Small unmanned aircraft (SUA), more commonly known as “drone”, is defined as unmanned aircraft weighing 25 kilograms or less according to the International Civil Aviation Organization’s general classification of unmanned aviation. SUA has been gaining popularity both locally and worldwide. The uses of these drones range from STEM education to professional deployment for powerline inspection, surveying, 3D mapping, search and rescue operations, aerial photography and filming, drone shows, etc. To cater for the applications and developments of SUA while safeguarding aviation and public safety, the SUA Order (Cap. 448G), a piece of subsidiary legislation made under the Civil Aviation Ordinance (Cap. 448), came into effect on 1 June 2022.

2. Under the SUA Order, there are three types of SUA, namely Category A1 SUA (with weight not exceeding 250 grams), Category A2 SUA (with weight exceeding 250 grams but not exceeding 7 kilograms) and Category B SUA (with weight exceeding 7 kilograms but not exceeding 25 kilograms). Moreover, there are two types of SUA operations, namely Standard Operations (i.e. operations of Category A1 and Category A2 SUA within the applicable operating requirements as specified by the Civil Aviation Department (CAD)) and Advanced Operations (e.g. operations of Category B SUA). While prior permission from CAD is not required for conducting Standard Operations, prior permission from CAD is required for conducting Advanced Operations. The Audit Commission (Audit) has recently conducted a review to examine the regulation of operations of SUA by CAD with a view to identifying areas for improvement.

Registration, training and assessment requirements

3. **Registration of SUA.** Under the registration system administered by CAD, SUA for Category A2 Operations and Advanced Operations are required to be registered. With a view to enabling the public to register, obtain safety information and get prepared for compliance with the SUA Order, CAD launched the Electronic

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Portal for Small Unmanned Aircraft (eSUA) in May 2022. Being a designated information system under the SUA Order, eSUA is a one-stop platform for the public to register and obtain safety information on operation, relevant requirement documents and guidance materials. As at 30 June 2024, there were 24,070 registered SUA (i.e. valid SUA held by active accounts in the database of eSUA) (paras. 1.5(a) and 1.7(a)). Audit examination revealed the following room for improvement:

- (a) ***Need to remind public to deregister SUA when applying for deletion of eSUA account.*** According to CAD's guidelines, if a holder of an eSUA account applies for deletion of his account, unless the reason is already known from any prior communication, CAD will contact the account holder by phone or by any other appropriate means to confirm the intention to delete the account. There was no mention of the handling of valid SUA held under deleted eSUA accounts. Audit examined the database of eSUA and found that as at 30 June 2024, there were 30 valid SUA held under 22 deleted accounts. If an eSUA account has been deleted, there may no longer be any responsible person for the valid SUA held under the deleted account (paras. 2.5 to 2.7);

- (b) ***Need to enhance verification of SUA registration.*** According to CAD's guidelines, on a daily basis, CAD officers will scrutinise a list of new applications for registration of SUA with a view to identifying any odd data (e.g. unreasonable weight). Applications with odd data should not be processed further. CAD officers will seek clarification from the applicants concerned as required. For a new application for registration, the pertinent SUA of which and another registered SUA share identical brand, model and serial number, CAD officers will approach the applicant for clarification. If the pertinent SUA has already been registered under a responsible person other than the applicant, CAD will refuse the new application. In the database of eSUA, as at 30 June 2024, of the 24,070 registered SUA, 6,910 (29%) had weights not exceeding 250 grams (i.e. Category A1 SUA), 16,972 (70%) had weights exceeding 250 grams but not exceeding 7 kilograms (i.e. Category A2 SUA), and 188 (1%) had weights exceeding 7 kilograms but not exceeding 25 kilograms (i.e. Category B SUA). Audit examined the 6,030 (25%) registered SUA of the top five common models of Category A2 SUA in eSUA and found that there were odd data which might warrant further investigation by CAD, as follows:

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- (i) ***Weights not matching SUA models.*** The standard weights of the 6,030 registered SUA of the top five common Category A2 SUA models range from 430 to 907 grams. Of them, 6,005 (99.6%) SUA had been correctly recorded as Category A2 SUA (i.e. exceeding 250 grams but not exceeding 7 kilograms) in eSUA. However, of the remaining 25 (0.4%) registered SUA, 22 had been recorded as 250 grams or below (ranging from 168 to 250 grams) and 3 had been recorded as over 7 kilograms (ranging from 24 to 25 kilograms); and

- (ii) ***Duplicate serial numbers.*** While each SUA should have a unique serial number, of the 6,030 registered SUA, 130 (2.2%) had duplicate serial numbers recorded in eSUA (paras. 2.8 and 2.9); and

- (c) ***Need to continue to follow through large number of SUA under verification.*** For registration of SUA, after reviewing the information provided by the applicant, CAD will issue to the applicant a registration certificate and a registration label for the pertinent SUA. The registration label contains a unique registration number and an identification mark (i.e. a quick-response code). Upon receipt of the registration label, the applicant should affix the registration label properly on the pertinent SUA. According to CAD:
 - (i) for registration labels issued prior to 31 May 2024, applicants were required to upload a photograph of the pertinent SUA affixed with the registration label in sight to eSUA for validation by CAD, after which the SUA would be successfully registered and an SUA registration certificate would be generated for the applicants. Before the applicants uploaded photographs of the pertinent SUA affixed with the registration labels in sight to eSUA for validation by CAD, the registrations were classified as SUA under verification; and

 - (ii) as a streamlined procedure to facilitate the public to complete the registration process, the requirement for uploading a photograph of the pertinent SUA affixed with the registration label was withdrawn for registration labels issued on or after 31 May 2024.

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Audit examined the database of eSUA and found that as at 30 June 2024, there were 6,997 SUA under verification, including 1,257 (18%) SUA that had been put under such classification for more than 24 months. While CAD has drawn up plans and taken measures to handle the SUA under verification by 30 November 2024, CAD needs to continue to closely monitor the handling of the SUA under verification and take measures to ensure that those cases will be properly followed through (paras. 2.4 and 2.14).

4. ***SUA Approved Training Organisations (ATOs).*** Under the SUA Order, remote pilots for Advanced Operations are required to undergo advanced training and assessment from an SUA ATO at their own cost, unless they are able to demonstrate an alternative means of compliance. Upon successful completion of the training and assessment, the remote pilot concerned may apply to CAD for assignment of an advanced rating for conducting Advanced Operations. As at 30 June 2024, there were 8 SUA ATOs that could offer advanced training and assessment. According to CAD, an approval granted to an SUA ATO is normally valid for a maximum period of two years, except for a first-time applicant, for which the approval is normally valid for a maximum period of one year (paras. 1.5(b) and 2.26). Audit examination revealed the following room for improvement:

(a) ***Need to improve assessment of initial applications and renewal applications.*** As at 30 June 2024, besides the 8 SUA ATOs, 1 SUA ATO had obtained the approval in principle granted by CAD. Audit sample check of 10 applications (involving 6 initial applications and 4 renewal applications submitted by 6 SUA ATOs) approved in the period from 1 June 2022 to 30 June 2024 found areas for improvement, as follows:

(i) ***Checklist for audits not updated.*** With a view to facilitating the conduct of desktop audits, venue audits, on-site course assessments and on-site audits by CAD officers in the assessment of initial applications and renewal applications, an internal checklist had been devised by CAD. In October 2023, CAD promulgated a number of updated and additional requirements, including shortening the time for reporting full details of accidents and incidents upon occurrence to CAD by SUA ATOs from within 3 calendar days to within 24 hours. However, the checklist had not been updated accordingly to facilitate the audits conducted by CAD officers. For example, in 1 of the 2 applications approved by CAD in the period from

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November 2023 to June 2024, the deficiency in the applicant's stipulated procedures for reporting accidents and incidents to CAD within 3 calendar days, instead of 24 hours, could not be identified during the desktop audit and brought to the attention of the applicant for revising the pertinent procedures; and

- (ii) ***Inadequacies in vetting guidance documents on reporting procedures and handling of occurrences.*** According to CAD's guidelines, each SUA ATO should provide clear guidance on the reporting procedures (e.g. the reporting time frame and reporting line) and handling of occurrences (e.g. accidents). Audit examined the guidance documents submitted in the 10 applications and noted that in 1 (10%) application, the guidance document submitted had not covered the reporting procedures and handling of occurrences. In other 3 (30%) applications (involving 2 SUA ATOs), the reporting procedures in the guidance documents submitted had not specified the reporting time frame and reporting line (para. 2.27(a) and (d)); and

- (b) ***Need to consider conducting continued oversight audits on unannounced basis.*** According to CAD's guidelines, continued oversight audits on SUA ATOs may be conducted on a periodic basis by CAD or as required by CAD on an announced or unannounced basis. The audits will focus on the effectiveness of the training, compliance with the procedures and requirements, and quality and safety assurance systems. From 1 June 2022 to 30 June 2024, CAD conducted 2 continued oversight audits on 2 SUA ATOs. Audit examined the records of these 2 continued oversight audits and noted that they were all conducted on an announced basis (i.e. pre-arranged visits to SUA ATOs). With a view to enhancing the effectiveness of continued oversight audits, CAD needs to consider conducting continued oversight audits on an unannounced basis as far as practicable (paras. 2.30(a) and 2.31).

Advanced Operations permission and insurance requirements

5. ***Advanced Operations permission (AOP).*** As mentioned in paragraph 2, prior permission from CAD is required for conducting Advanced Operations. According to CAD's guidelines, applications for AOP will only be processed if the

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applicants are considered fit and capable of conducting the specific types of Advanced Operations in Hong Kong safely. The maximum validity period of an AOP is up to six months for new applications and up to two years for renewal applications. An AOP holder will be subject to CAD's oversight through a surveillance programme so as to ensure the AOP holder's continuous compliance with the applicable regulatory requirements and AOP conditions. The surveillance programme for AOP holders comprises flight demonstrations for initial applications for AOP or any high-risk/novel operations, scheduled oversight audits based on safety risk analysis and ad-hoc inspections upon CAD's request. AOP holders will be subject to CAD's scheduled oversight audits at least once within the AOP validity period. Renewal applications for AOP will be considered based on the previous performance under the surveillance programme. In particular, an AOP will only be renewed if a scheduled oversight audit has been performed in the past 12 months and when all findings identified in scheduled oversight audits have been duly addressed (paras. 3.4 to 3.6). Audit examination revealed the following areas for improvement:

- (a) ***Need to take measures to ensure that all AOP holders are subject to scheduled oversight audits at least once within AOP validity periods.*** According to CAD records, 94 AOP granted for initial applications and renewal applications by CAD had expired on or before 30 June 2024. Audit analysed the records of scheduled oversight audits of these 94 cases and noted that for some cases, scheduled oversight audits had not been conducted at least once within their AOP validity periods, as follows:
 - (i) no scheduled oversight audit had been conducted for 9 (10%) cases. In particular, of the 9 cases, the subsequent renewal of AOP of 2 cases had been granted by CAD. This was contrary to CAD's guidelines that an AOP will only be renewed if a scheduled oversight audit has been performed in the past 12 months; and
 - (ii) for 11 (12%) cases, instead of within the respective validity periods, the scheduled oversight audits were conducted after the expiry of the respective AOP, ranging from 2 to 43 days (para. 3.8); and
- (b) ***Time intervals between expiry of AOP and approvals granted for renewal applications.*** According to CAD's guidelines, for AOP covering a specified period of time, the AOP holder may make an application to renew the pertinent AOP. Such an application should be submitted at least 30 calendar days prior to the expiry of the existing AOP (i.e. the specified date for submission of renewal applications). Of the 79 renewal

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applications for AOP approved by CAD as at 30 June 2024, there were time intervals, ranging from 1 day to 270 days, between the expiry dates of the previous AOP and the effective dates of the renewed AOP for 47 (59%) cases. Of the 47 cases, Audit noted that in 43 (91%) cases, the renewal applications were not submitted to CAD at least 30 calendar days prior to the expiry of the previous AOP, with delays ranging from 1 day to 183 days. Audit examined the 3 cases with delays in the submission of renewal applications to CAD for over 90 days and found that:

- (i) in 1 case, no reminder had been sent to the concerned AOP holder. In the remaining 2 cases, while reminders had been sent to the concerned AOP holders, they were sent after the specified date for submission of renewal applications (i.e. 30 calendar days prior to the expiry of the previous AOP); and
- (ii) in 2 cases, the scheduled oversight audits were conducted by CAD after the validity periods of the respective AOP and thus the findings of the scheduled oversight audits were only duly addressed by the AOP holders 90 and 103 days after the expiry dates of the previous AOP.

AOP holders are generally commercial organisations in the fields of aerial photographing, surveying/inspection, etc. As no Advanced Operations should be conducted after the expiry of AOP, it is important that their AOP is renewed in a timely manner so that their business operations would not be interrupted (paras. 3.14 to 3.16 and 3.18).

6. ***Need to keep in view market readiness for rolling out insurance products for Category A2 Operations.*** According to CAD, in July 2021, when enacting the SUA Order for commencement on 1 June 2022, having considered that Hong Kong was densely populated and in view of the potential risks that SUA might pose to third parties, insurance requirements in respect of third party liability for bodily injury and/or death were imposed for SUA for Category A2 Operations and Advanced Operations. The minimum coverage for Category A2 Operations and Advanced Operations were set at \$5 million and \$10 million respectively. After balancing the market readiness situation and risks to public safety, a phased approach in setting the timing for the mandatory insurance requirements was adopted. The first phase was mandatory insurance for Advanced Operations, which took effect immediately upon commencement of the SUA Order, and the second phase will be mandatory insurance

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for Category A2 Operations, which will commence on a later date to be specified by the Director-General of Civil Aviation by notice published in the Gazette. In March 2023, CAD commissioned a tertiary education institution to conduct a survey on the public use of SUA in Hong Kong with a view to, among others, collecting public views on different aspects for the review on insurance requirements. According to CAD, the survey reflected that the readiness of the SUA operators and the insurance market in offering sufficient choices of third party insurance products for Category A2 Operations had yet to be developed (paras. 3.21 and 3.22).

Other related issues

7. *Need to improve monitoring of performance of service providers of promotional campaigns.* According to CAD, in December 2022 and January 2023, it launched a promotional campaign on the SUA Order in various public transport modes at a cost of \$1.2 million. Under the promotional campaign, CAD entered into service contracts with 3 public transport operators for placing advertisement displays on the exterior and interior of buses, bus shelters and tram shelters. Audit examination revealed the following:

- (a) the 2 bus operators were required to distribute the displays of advertisements across their service networks, including Hong Kong Island, Kowloon, the New Territories and Lantau Island. According to CAD, it was subsequently noted that 1 bus operator's service network did not cover Lantau Island;
- (b) based on the route list submitted by 1 bus operator:
 - (i) while the service contract required that the advertisements should be displayed at the back of bus seats on at least 38 buses, the route list only contained information on the network coverage of the buses (i.e. 37 bus routes); and
 - (ii) while the service contract required that the advertisements should be displayed at the back of bus seats for 8 weeks, the information on the route list could only show that the advertisements had been displayed for 6 weeks; and

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- (c) while the 2 bus operators were required to provide photographs of the advertisement displays on bus exterior and/or interior, photographs of some samples but not all of the advertisement displays had been submitted.

While the concerned bus operator had only submitted sampled photographs and a supplementary route list to substantiate its compliance with the service contract, there was no documentary evidence showing that CAD had taken any follow-up actions with the bus operator to request additional information or proof before settling the contract payment in full in February 2023 (paras. 4.12, 4.13 and 4.15).

8. *Need to make sustained efforts in arranging publicity and education targeting visitors.* From time to time, there were media reports on breaching the SUA Order by visitors (e.g. flight of SUA within a restricted flying zone without permission and flight of non-registered SUA). For example, in early December 2023 and early July 2024, 3 visitors and 1 visitor were respectively reported to have breached the SUA Order. Moreover, according to CAD, of the 38 cases of suspected violations of the SUA Order handled by CAD as at 30 June 2024, visitors were involved in 13 (34%) cases. These indicated that visitors might not be well aware of the requirements under the SUA Order. With a view to enhancing the awareness of visitors on the SUA Order, CAD needs to make sustained efforts in arranging publicity and education targeting visitors (paras. 4.16 and 4.18).

9. *Need to sustain efforts in facilitating wider use of SUA.* According to CAD, as a facilitator, CAD is working with the industry partners and government users under the framework of the existing SUA Order to explore various ways to further widen the applications of SUA, as well as to further expedite the application process. As different application scenarios may involve different requirements on aircraft loading, flight range, flight duration, operational reliability and safety, the Government will implement pilot projects in a gradual and orderly manner, starting with the transport of goods by unmanned aircraft, and then gradually widening and enriching the application scenarios of unmanned aircraft from the near to the far, and from the light to the heavy. CAD needs to sustain its efforts in facilitating the wider use of SUA in Hong Kong (paras. 4.21(b), 4.23(b) and 4.24).

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Audit recommendations

10. 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-General of Civil Aviation should:

Registration, training and assessment requirements

- (a) enhance eSUA so that when an account holder applies for deletion of his account, a reminder will be prompted to alert him to deregister SUA where applicable (para. 2.19(a));
- (b) investigate and rectify any odd data identified in eSUA including those mentioned in paragraph 3(b), and explore the feasibility of enhancing system control measures of eSUA in identifying odd data (para. 2.19(b) and (c));
- (c) continue to closely monitor the handling of the SUA under verification and take measures to ensure that those cases will be properly followed through (para. 2.19(d));
- (d) improve the assessment of initial applications and renewal applications for SUA ATOs (para. 2.32(a));
- (e) consider conducting continued oversight audits on SUA ATOs on an unannounced basis as far as practicable (para. 2.32(b));

AOP and insurance requirements

- (f) take measures to ensure that all AOP holders are subject to scheduled oversight audits at least once within their AOP validity periods, and remind the staff of CAD to, as far as practicable, adhere to the guidelines that an AOP will only be renewed if a scheduled oversight audit has been performed in the past 12 months and when all findings identified in scheduled oversight audits have been duly addressed (para. 3.19(a) and (b));

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- (g) **consider formalising the practice of issuing reminders to AOP holders before the specified date for submission of renewal applications, and take into account the time required for arranging and completing the scheduled oversight audits and AOP holders to address the findings when planning the schedule for conducting scheduled oversight audits (para. 3.19(e) and (f));**
- (h) **keep in view the market readiness for rolling out insurance products for Category A2 Operations and take forward the implementation of the second phase of insurance requirements when the SUA operators and insurance market are ready (para. 3.27);**

Other related issues

- (i) **improve the monitoring of the performance of service providers of promotional campaigns (para. 4.19(a));**
- (j) **make sustained efforts in arranging publicity and education targeting visitors with a view to enhancing their awareness on the SUA Order (para. 4.19(b)); and**
- (k) **make sustained efforts in facilitating the wider use of SUA in Hong Kong (para. 4.25).**

Response from the Government

11. The Director-General of Civil Aviation generally 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 Small unmanned aircraft (SUA), more commonly known as “drone”, is defined as unmanned aircraft weighing 25 kilograms or less according to the International Civil Aviation Organization’s general classification of unmanned aviation. SUA has been gaining popularity both locally and worldwide. The uses of these drones range from STEM education to professional deployment for powerline inspection, surveying, 3D mapping, search and rescue operations, aerial photography and filming, drone shows, etc. In recent years, the extensive application of unmanned aircraft in different aspects has opened up development potentials and economic opportunities. As innovation and technology progress, it is expected that SUA applications will continue to grow, in terms of both popularity and diversity.

1.3 To cater for the applications and developments of SUA while safeguarding aviation and public safety, the SUA Order (Cap. 448G), a piece of subsidiary legislation made under the Civil Aviation Ordinance (Cap. 448), came into effect on 1 June 2022 (Note 1). According to the Civil Aviation Department (CAD):

- (a) during the law drafting processes, references had been made to the regulatory requirements of key civil aviation authorities around the world, including the Mainland, the United States and the United Kingdom;
- (b) under its diligent effort in conducting intensive engagement work, the SUA Order gained support from the Members of the Legislative Council during the legislative enactment process;

Note 1: *To allow the community to smoothly transit into the new regulatory regime, a six-month grace period was given to allow the public to familiarise themselves with the new requirements and prepare for compliance.*

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- (c) the SUA Order provides a forward-looking regulatory regime that can foster the innovative development and application of SUA in Hong Kong in tandem with evolving technology, while safeguarding aviation and public safety. Flexibility has been built in the SUA Order to cater for different types of SUA operations and the rapid development of SUA;
- (d) detailed technical requirements under the SUA Order, such as operating requirements, are specified and promulgated through Gazette Notices and the Safety Requirements Document; and
- (e) since the enactment of the SUA Order, the Government and private users have been promoting under the regulatory framework the use of SUA in an increasingly wide range of areas (see para. 1.2).

SUA Order

1.4 ***Risk-based classification.*** According to CAD, SUA operations, regardless of recreational or commercial purposes, are regulated under a risk-based approach and classified according to the weight (Note 2) of SUA and the operational risk level. The categorisation of SUA and SUA operations are as follows:

- (a) ***SUA.*** There are three types of SUA (see Photographs 1(a) to (c) for some examples), namely:
 - (i) ***Category A1 SUA.*** An SUA is categorised as a Category A1 SUA if its weight does not exceed 250 grams at all times during the flight;

Note 2: *In determining the weight, everything installed in, carried by or attached to the SUA will be taken into account.*

- (ii) **Category A2 SUA.** An SUA is categorised as a Category A2 SUA (Note 3) if its weight exceeds 250 grams at any time during the flight but does not exceed 7 kilograms at all times during the flight; and
 - (iii) **Category B SUA.** An SUA is categorised as a Category B SUA if its weight exceeds 7 kilograms at any time during the flight but does not exceed 25 kilograms at all times during the flight; and
- (b) **SUA operations.** There are two types of SUA operations, namely:
- (i) **Standard Operations.** Operations of Category A1 and Category A2 SUA within the applicable operating requirements as specified by CAD (see para. 1.6) are known as Category A1 Operations and Category A2 Operations respectively. They are categorised as Standard Operations. Prior permission from CAD is not required for conducting Standard Operations; and
 - (ii) **Advanced Operations.** The following operations are categorised as Advanced Operations:
 - operations of Category A1 or A2 SUA that exceed the applicable operating requirements, except wholly within an enclosed area;
 - operations of Category B SUA;
 - operations of any SUA within a restricted flying zone, except wholly within an enclosed area; or
 - operations involving carriage of dangerous goods.

Note 3: *According to CAD, with a view to balancing the operational need as well as aviation and public safety, an exemption has been made for Category A1 SUA that are equipped with a safety system capable of performing all the functions specified in or pursuant to section 13 of the SUA Order for the purposes of section 11(1)(d) of the Order. Under the exemption, such Category A1 SUA can be operated within all the operating requirements applicable to Category A2 SUA, and are subject to other regulatory requirements applicable to Category A2 SUA. For simplicity, in this Audit Report, such Category A1 SUA under exemption are hereinafter referred to as Category A2 SUA.*

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Prior permission from CAD is required for conducting Advanced Operations.

Photographs 1(a) to (c)

Examples of SUA

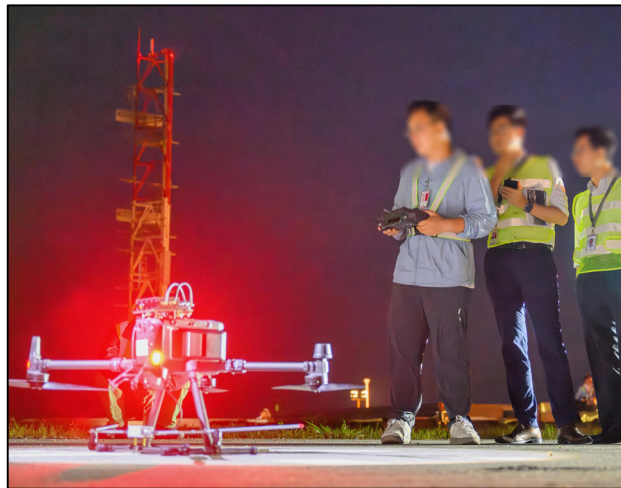
(a) Category A1 SUA



(b) Category A2 SUA



(c) Category B SUA



Source: CAD records

1.5 **Regulatory requirements.** The salient regulatory requirements are as follows:

- (a) **Registration and labelling requirements.** Under the registration system administered by CAD, both SUA and remote pilots for Category A2 Operations and Advanced Operations are required to be registered, as follows:
 - (i) **SUA.** For registration of SUA, the registrant, normally the SUA owner, should be a natural person of at least 18 years of age, body corporate or unincorporated body. Upon successful registration, the registrant will become the responsible person of the SUA concerned. The responsible persons are required to affix a standardised SUA label with unique registration number issued by CAD on the registered SUA; and
 - (ii) **Remote pilot.** For registration of remote pilot, the registrant should be a natural person of at least 14 years of age. During the registration, the registrant is required to go through safety information and know-how on safe SUA operations to enhance their safety awareness. Upon completion of the registration process, a standard rating will be assigned to the registered remote pilot.

As at 30 June 2024, there were 24,070 registered SUA (i.e. valid SUA held by active accounts in the database of the Electronic Portal for Small Unmanned Aircraft (eSUA — see para. 1.7(a)(ii))) and 25,721 registered remote pilots;

- (b) **Training and assessment requirements.** Suitable training helps ensure competency and enhance safety awareness of remote pilots. In addition to the safety awareness information mentioned in (a)(ii) above, remote pilots for Advanced Operations are required to undergo advanced training and assessment from an SUA Approved Training Organisation (ATO) at their own cost, unless they are able to demonstrate an alternative means of compliance. Upon successful completion of the training and assessment, the remote pilot concerned may apply to CAD for assignment of an advanced rating for conducting Advanced Operations. As at 30 June 2024, there were 8 SUA ATOs that could offer advanced training and assessment;

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- (c) ***Equipment requirements.*** SUA for Category A2 Operations and Advanced Operations should be equipped with basic capabilities of flight log (for recording basic flight parameters) and geo-awareness (for providing real-time information and alerts to remote pilots on airspace restrictions); and

- (d) ***Insurance requirements.*** According to CAD, after balancing the market readiness situation and risks to public safety, a phased approach in setting the timing for the mandatory insurance requirements in respect of third party liability for bodily injury and/or death was adopted, as follows:
 - (i) the first phase was mandatory insurance for Advanced Operations with a minimum coverage level of \$10 million, which took effect immediately upon commencement of the SUA Order; and

 - (ii) the second phase will be mandatory insurance for Category A2 Operations with a minimum coverage level of \$5 million, which will commence on a later date to be specified by the Director-General of Civil Aviation by notice published in the Gazette.

Table 1 summarises the salient regulatory requirements under the SUA Order.

Table 1

Salient regulatory requirements under SUA Order

Requirement	Standard Operations		Advanced Operations
	Category A1	Category A2	
Registration and labelling	No	Yes	Yes
Training and assessment	No	No	Yes
Equipment — basic requirements (flight log and geo-awareness)	No	Yes	Yes
Insurance	No	Effective date to be determined (Note)	Yes
CAD's prior permission before flight	No	No	Yes

Source: Audit Commission analysis of CAD records

Note: According to CAD, the effective date for implementing insurance requirements for Category A2 Operations with a minimum coverage level of \$5 million is to be determined (see para. 1.5(d)(ii)).

1.6 **Operating requirements.** Under the SUA Order, all SUA operations should be subject to applicable operating requirements as specified by CAD (e.g. maximum flying altitude, maximum speed and minimum lateral separation from uninvolved people/structures/vehicles/vessels). Table 2 shows the details of the operating requirements.

Introduction

Table 2

Operating requirements under SUA Order

Requirement	Standard Operations		
	Category A1	Category A2	
Time of operations	Daylight only		
Maintain full-time visual line of sight required	Yes		
Maximum flying altitude (above ground level)	100 feet	300 feet	
Minimum lateral separation from uninvolved people/structures/vehicles/vessels	10 metres	10 metres	30 metres
Maximum speed	20 kilometres per hour	20 kilometres per hour	50 kilometres per hour
Maximum number of SUA to be operated by a remote pilot at the same time	1		
Maximum dimensions of SUA	1 metre, except that the longest distance between any two rotor blade tips can be up to 1.2 metres		
Carriage of person or animal	Not allowed		
Nothing to be dropped from SUA	Unless with permission		

Source: CAD records

Remarks: According to CAD, unless otherwise specified or permitted by CAD, the operating requirements applicable to Advanced Operations are the same as those applicable to Category A2 Operations.

Preparation work on implementation of SUA Order

- 1.7 According to CAD:
- (a) in order to prepare for the implementation of the SUA Order, CAD had made substantial efforts in various aspects:
 - (i) the SUA Order allowed for a six-month grace period (see Note 1 to para. 1.3); and
 - (ii) with a view to enabling the public to register, obtain safety information and get prepared for compliance with the new regulations, CAD launched eSUA in May 2022 (i.e. before the SUA Order came into effect). Being a designated information system under the SUA Order, eSUA is a one-stop platform for the public to register and obtain safety information on operation, relevant requirement documents and guidance materials. The public can access eSUA via the web portal or its mobile application, refer to the Drone Map on eSUA for the updated restricted flying zones and receive notifications of the latest safety updates;
 - (b) riding on the official launch of eSUA, various publicity campaigns targeting the mass public have also been rolled out, including television and radio announcements, promotional videos, posters and leaflets, update of CAD website, online advertisements at social media platforms, etc. with an aim to promulgating the new Order to the public. Effort on publicity continued after the full commencement of the SUA Order in December 2022 to educate the public on the legislative requirements. Diverse publicity events were carried out, such as setting up booths at open days, conducting seminars and workshops at youth events, setting up banners and distributing leaflets at hotspots, etc.;
 - (c) with a view to supporting the implementation of the SUA Order, a number of key safety documents, including the Safety Requirements Document and various advisory documents to facilitate the operations of SUA by different user groups (e.g. night operations and drone shows) have been published on CAD website since March 2022. Large-scale briefings were also provided to the industry, including existing and interested SUA operators,

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professional bodies, SUA associations, etc., and government bureaux and departments between March and May 2022;

- (d) different and targeted stakeholder engagement work continues to proceed, with presentations and briefings provided for specific focus groups, including industry partners, SUA associations, commercial operators and professional bodies. To facilitate the smooth transition to the new regime, the application for long-term Advanced Operations permission (AOP) has been rolled out since April 2022;
- (e) advanced training helps remote pilots to acquire safety information and operational knowledge, strengthen their understanding of the new regulatory requirements of SUA operations, and enhance their situational awareness and safety management skills through flight planning, risk assessment and mitigating measures to ensure aviation and public safety. The approval scheme for SUA training was launched in December 2021 following a large-scale briefing provided to the industry; and
- (f) facilitation for SUA operations conducted in school premises for educational or research purposes, as well as enclosed area, is also provided. For these operations, certain requirements are dispensed with. For example, the registration of remote pilots, training and assessment requirements are not required provided that the relevant safety measures are implemented.

Attributing to the above-mentioned efforts, up to June 2024, there were over 37,000 applications for eSUA account registrations, 30,000 remote pilot registrations and 40,000 SUA registrations. Furthermore, as of June 2024, there were about 100 AOP holders and 8 SUA ATOs offering advanced training courses. These are all indications of positive public acceptance to the legislative enactment of the SUA Order providing a clear and flexible regulatory regime, as well as the facilitation effort by CAD.

Responsible office of CAD

1.8 Under the Air Services and Safety Management Division, the Unmanned Aircraft Office (see Appendix A for an extract of the organisation chart of CAD),

headed by a Chief Operations Officer (Note 4), is responsible for regulating the operations of unmanned aircraft systems in Hong Kong. As at 30 June 2024, the number of staff responsible for such work in the Unmanned Aircraft Office was 19 (including 11 staff engaged under the Post-retirement Service Contract Scheme).

Audit review

1.9 As mentioned in paragraph 1.3, safeguarding aviation and public safety is the prime objective of the SUA Order. According to CAD, in the period from 1 June 2022 to 30 June 2024, 44 SUA-related reports from airspace users, AOP holders or operators from government departments were received (Note 5). In May 2024, the Audit Commission (Audit) commenced a review of the regulation of operations of SUA by CAD. The audit review has focused on the following areas:

- (a) registration, training and assessment requirements (PART 2);
- (b) AOP and insurance requirements (PART 3); and
- (c) other related issues (PART 4).

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

General response from the Government

1.10 The Director-General of Civil Aviation generally agrees with the audit recommendations and expresses appreciation to Audit for the comprehensive review of CAD's work in the regulation of SUA operations. He has said that CAD reaffirms the Government's commitment to safeguarding aviation and public safety in the

Note 4: *According to CAD, other than the Unmanned Aircraft Office, the Chief Operations Officer also looks after another office of the Division.*

Note 5: *According to CAD, most of the SUA-related reports were SUA sighting reports. For the report that involved injury of a remote pilot in November 2023, CAD had taken follow-up actions accordingly.*

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regulation of SUA operations, while facilitating the development and applications of SUA in tandem with the evolving technology.

Acknowledgement

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

PART 2: REGISTRATION, TRAINING AND ASSESSMENT REQUIREMENTS

2.1 This PART examines the work of CAD in implementing the registration, training and assessment requirements under the SUA Order, focusing on:

- (a) registration of SUA (paras. 2.2 to 2.20); and
- (b) SUA ATOs (paras. 2.21 to 2.33).

Registration of small unmanned aircraft

2.2 According to CAD, eSUA was launched in May 2022 (see para. 1.7(a)(ii)) to encourage the public to register within the grace period so as to get prepared for compliance with the SUA Order. Detailed user guide and supplementary information throughout the registration process are provided to facilitate the public to complete their registration applications.

2.3 An applicant may first create an eSUA account (Note 6) and then submit an application for registration of SUA by providing the following mandatory information via eSUA:

- (a) ***Manufactured SUA.*** For registering a manufactured SUA, the brand, model, type, serial number and weight of SUA should be provided; and
- (b) ***Privately-built SUA.*** For registering a privately-built SUA, the type and weight of SUA should be provided.

2.4 After reviewing the information provided by the applicant, CAD will issue to the applicant a registration certificate and a registration label for the pertinent SUA. The registration label contains a unique registration number and an identification mark

Note 6: *According to CAD, while there is no limit on the number of SUA registered under an eSUA account, one SUA should only be registered under one responsible person.*

Registration, training and assessment requirements

(i.e. a quick-response code). Upon receipt of the registration label, the applicant should affix the registration label properly on the pertinent SUA. According to CAD:

- (a) ***Requirement for uploading photograph to eSUA prior to 31 May 2024.*** For registration labels issued prior to 31 May 2024, applicants were required to upload a photograph of the pertinent SUA affixed with the registration label in sight to eSUA for validation by CAD, after which the SUA would be successfully registered and an SUA registration certificate would be generated for the applicants. Detailed instructions were provided in the letters issued by CAD, and system announcements and the Safety Requirements Document published on eSUA and CAD website;
- (b) ***Streamlined procedure since 31 May 2024.*** As a streamlined procedure to facilitate the public to complete the registration process, the requirement for uploading a photograph of the pertinent SUA affixed with the registration label was withdrawn for registration labels issued on or after 31 May 2024. Such streamlined procedure was devised as a result of an internal review conducted since August 2023. The internal review took into account various considerations, including the legal aspect, the experience gained regarding the effectiveness in the monitoring of the labelling requirement during SUA operations, as well as feedback from the public regarding the compliance with the labelling requirement; and
- (c) ***SUA under verification.*** For SUA with registration labels issued prior to 31 May 2024, before the applicants uploaded photographs of the pertinent SUA affixed with the registration labels in sight to eSUA for validation by CAD, the registrations were classified as SUA under verification. Although it is the responsibility of these applicants to complete the registration procedures, CAD issued reminder emails in May, July and September 2024 to remind the applicants to upload photographs of SUA with the affixed registration labels to eSUA. One more round of reminder emails would be issued to the applicants in October 2024. If the applicants do not complete verification by 30 November 2024, the registrations will be deemed withdrawn.

***Need to remind public to deregister SUA
when applying for deletion of eSUA account***

2.5 According to CAD's guidelines, if a holder of an eSUA account applies for deletion of his account, unless the reason is already known from any prior communication, CAD will contact the account holder by phone or by any other appropriate means to confirm the intention to delete the account. There was no mention of the handling of valid SUA held under deleted eSUA accounts.

2.6 Audit examined the database of eSUA and found that as at 30 June 2024, there were 30 valid SUA held under 22 deleted accounts. In September 2024, CAD informed Audit that:

- (a) of the 30 valid SUA, 19 were dummy/testing entries and they had been deregistered;
- (b) the remaining 11 valid SUA held under 8 deleted accounts accounted for 0.046% of the 24,070 registered SUA or 0.027% of the 40,151 SUA registration applications. CAD would take appropriate measures to rectify their eSUA records; and
- (c) as SUA registration bore legal status, it might not be appropriate to automatically deregister the registration upon account deletion. Moreover, there was no necessary correlation between a deleted eSUA account and the SUA held under the account. Therefore, a more suitable approach was to remind the holders of deleted accounts to deregister their SUA where applicable.

2.7 If an eSUA account has been deleted, there may no longer be any responsible person for the valid SUA held under the deleted account (see para. 1.5(a)(i)). In Audit's view, CAD needs to enhance eSUA so that when an account holder applies for deletion of his account, a reminder will be prompted to alert him to deregister SUA where applicable.

Registration, training and assessment requirements

Need to enhance verification of SUA registration

2.8 According to CAD's guidelines:

- (a) on a daily basis, CAD officers will scrutinise a list of new applications for registration of SUA with a view to identifying any odd data (e.g. unreasonable weight or a drone type that does not match the SUA model). Applications with odd data should not be processed further. CAD officers will seek clarification from the applicants concerned as required; and
- (b) for a new application for registration, the pertinent SUA of which and another registered SUA share identical brand, model and serial number, CAD officers will approach the applicant for clarification. If the pertinent SUA has already been registered under a responsible person other than the applicant, CAD will refuse the new application.

According to CAD, in particular, with a view to facilitating applicants in entering the correct serial numbers, CAD had provided elaborative materials in the registration page of eSUA to guide applicants to locate the serial numbers.

2.9 In the database of eSUA, as at 30 June 2024, of the 24,070 registered SUA, 6,910 (29%) had weights not exceeding 250 grams (i.e. Category A1 SUA), 16,972 (70%) had weights exceeding 250 grams but not exceeding 7 kilograms (i.e. Category A2 SUA), and 188 (1%) had weights exceeding 7 kilograms but not exceeding 25 kilograms (i.e. Category B SUA). Audit examined the 6,030 (25%) registered SUA of the top five common models of Category A2 SUA in eSUA and found that there were odd data which might warrant further investigation by CAD, as follows:

- (a) ***Weights not matching SUA models.*** The standard weights of the 6,030 registered SUA of the top five common Category A2 SUA models range from 430 to 907 grams. Of them, 6,005 (99.6%) SUA had been correctly recorded as Category A2 SUA (i.e. exceeding 250 grams but not exceeding 7 kilograms) in eSUA. However, of the remaining 25 (0.4%) registered SUA, 22 had been recorded as 250 grams or below (ranging from 168 to 250 grams) and 3 had been recorded as over 7 kilograms (ranging from 24 to 25 kilograms) (see Table 3); and

Registration, training and assessment requirements

Table 3

**Weights of registered SUA of top five common Category A2 SUA models
(30 June 2024)**

SUA model	Standard weight (Note)	Number of registered SUA			
		250 grams or below	Exceeding 250 grams but not exceeding 7 kilograms	Exceeding 7 kilograms	Total
A	570 grams	9	1,871	1	1,881
B	595 grams	2	1,106	0	1,108
C	907 grams	3	1,047	1	1,051
D	430 grams	7	1,002	0	1,009
E	743 grams	1	979	1	981
Total		22	6,005	3	6,030

Source: Audit analysis of CAD records

Note: The standard weights referred to the weights listed in the product specifications of the respective SUA models.

- (b) **Duplicate serial numbers.** While each SUA should have a unique serial number, of the 6,030 registered SUA, 130 (2.2%) had duplicate serial numbers recorded in eSUA (see Table 4).

Registration, training and assessment requirements

Table 4

**Registered SUA with duplicate serial numbers
(30 June 2024)**

SUA model	Total number of registered SUA	Registered SUA with duplicate serial numbers	
		Number	Percentage
A	1,881	61	3.2%
B	1,108	18	1.6%
C	1,051	45	4.3%
D	1,009	2	0.2%
E	981	4	0.4%
Overall	6,030	130	2.2%

Source: *Audit analysis of CAD records*

2.10 According to CAD, since 31 May 2024, system control has been implemented in eSUA to prevent duplicate SUA registration for the same manufactured SUA. If the brand, model and serial number inputted by an applicant are identical to an existing record in eSUA, an alert message will be shown to the applicant and the registration will not be allowed. In September 2024, CAD informed Audit that:

- (a) the weight of SUA entered into eSUA was for general reference only. The requirements applicable to a flight were subject to the weight of the SUA operated in that particular flight;
- (b) various safeguarding measures, including system controls and manual checking, had been implemented to prevent odd data entry as far as practicable;

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- (c) the odd data identified by Audit constituted a minor fraction of the overall data examined (i.e. ranging from 0.4% to 2.2% of the 6,030 registered SUA); and
- (d) CAD remained committed to enhancing the checking and system controls as far as practicable.

2.11 In order to ensure that the information of registered SUA contained in eSUA is correct and accurate, Audit considers that CAD needs to investigate and rectify any odd data identified including those mentioned in paragraph 2.9. Audit noted that CAD had implemented system control in eSUA to prevent duplicate SUA registration. With a view to further strengthening and expediting the verification of SUA registration in eSUA, CAD needs to explore the feasibility of enhancing system control measures of eSUA in identifying odd data.

Need to continue to follow through large number of SUA under verification

2.12 As mentioned in paragraph 2.4, prior to the implementation of the streamlined procedure on 31 May 2024, applicants were required to upload a photograph of the pertinent SUA affixed with the registration label in sight to eSUA for validation by CAD, after which the SUA would be successfully registered and an SUA registration certificate would be generated for the applicants. Before the applicants uploaded the photographs to eSUA, the registrations were classified as SUA under verification (Note 7).

Note 7: *According to CAD's guidelines, if an SUA registration had been classified as an SUA under verification for more than one month, an email would be sent to the pertinent eSUA account holder with a view to reminding him to complete the registration procedures within 14 days. If no response was received by the deadline, CAD would send an email to confirm the withdrawal of the application of SUA registration. However, in light of the operational experience gained, CAD considered the original procedure ineffective in achieving the intended purpose of encouraging registration because of the low response by the applicants. As such, the streamlined procedure was formulated and implemented from 31 May 2024 (see para. 2.4(b)).*

Registration, training and assessment requirements

2.13 Following the implementation of the streamlined procedure, CAD will check the compliance of affixing the registration labels during audits on AOP holders and SUA ATOs, as well as flight demonstrations (see para. 3.4). CAD may also conduct random checks by requesting responsible persons of SUA to submit a photograph of SUA with the affixed label in sight.

2.14 Audit examined the database of eSUA and found that as at 30 June 2024, there were 6,997 SUA under verification, including 1,257 (18%) SUA that had been put under such classification for more than 24 months. Audit notes that CAD has drawn up plans and taken measures to handle the SUA under verification by 30 November 2024 (see para. 2.4(c)). In Audit's view, CAD needs to continue to closely monitor the handling of the SUA under verification and take measures to ensure that those cases will be properly followed through.

Disseminating to public information on position of implementation of SUA Order

2.15 From time to time, the Unmanned Aircraft Office would report the position of implementing the SUA Order to the senior management of CAD. For example, in the Directorate Grade Officer Meeting held in July 2024, it was reported to the senior management of CAD that the cumulative number of registered SUA as at 30 June 2024 was 40,151.

2.16 Regarding the 40,151 registered SUA, Audit noted that:

- (a) based on the database of eSUA, there were 24,070 registered SUA (i.e. valid SUA held by active accounts in the database of eSUA) as at 30 June 2024; and
- (b) the significant difference of 16,081 (i.e. 40,151 less 24,070) registered SUA was attributed to the fact that the cumulative number of registered SUA also contained numbers of SUA of other status (e.g. 6,997 SUA under verification (see para. 2.14), 6,944 cancelled/expired SUA and 11 valid SUA held under deleted accounts (see para. 2.6(b)) as at 30 June 2024).

Registration, training and assessment requirements

- 2.17 In September 2024, CAD informed Audit that:
- (a) throughout the preparation stage and early stage of implementation of the SUA Order, specific monthly briefings for the senior management were organised to provide regular updates for senior management’s close monitoring of the progress. The senior management was being provided with updates from time to time during regular meetings or as necessary. As regards the number of SUA under verification, it had been reported to the responsible Assistant Director-General when enhancing the verification process of SUA registration;
 - (b) the Directorate Grade Officer Meeting was only one occasion where various presentations were arranged to report or share updates on certain selected topics not necessarily associated with the implementation of the SUA Order. The necessity to break down the cumulative number of registered SUA and report it to the Directorate Grade Officer Meeting was subject to whether there was a genuine need for such detailed information; and
 - (c) for the briefing provided in the Directorate Grade Officer Meeting in July 2024, the objective was to provide all Directorate Grade Officers from different disciplines with a general update on the implementation of the SUA Order and the enhanced applications of SUA. In such context, the cumulative number of registered SUA was just one piece of information among many others and was not the central focus of the briefing. In such circumstance, CAD believed that there was no genuine need to delve into a breakdown of the cumulative number of registered SUA, as doing so could divert the attention of the target audience from the main purpose of the briefing. The cost-effectiveness and priority should also be balanced from the burden required for the team to generate and compile the detailed statistics.
- 2.18 Audit noted that the briefings for the senior management have not included information on the number of valid SUA held by active eSUA accounts (e.g. 24,070 registered SUA as at 30 June 2024 — see para. 2.16(a)). In response to Audit’s enquiry, CAD has said that it will keep in view the need of providing a breakdown of the cumulative number of registered SUA when disseminating to the public information on the position of implementation of the SUA Order in future.

Audit recommendations

2.19 **Audit has *recommended* that the Director-General of Civil Aviation should:**

- (a) **enhance eSUA so that when an account holder applies for deletion of his account, a reminder will be prompted to alert him to deregister SUA where applicable;**
- (b) **investigate and rectify any odd data identified in eSUA including those mentioned in paragraph 2.9;**
- (c) **explore the feasibility of enhancing system control measures of eSUA in identifying odd data; and**
- (d) **continue to closely monitor the handling of the SUA under verification and take measures to ensure that those cases will be properly followed through.**

Response from the Government

2.20 The Director-General of Civil Aviation generally agrees with the audit recommendations. He has said that CAD will continuously enhance eSUA and internal procedures as appropriate to further facilitate the public to complete various registration processes associated with the applications of SUA.

Small unmanned aircraft Approved Training Organisations

2.21 According to CAD, it rolled out a pilot scheme in July 2021 to validate the SUA training syllabus and assessment criteria with various bodies. Upon close liaison and briefing to the industry, CAD then launched the SUA ATO Scheme in December 2021 (see para. 1.7(e)) and invited participation by interested training organisations and bodies to provide advanced training courses and assessments for remote pilots conducting higher risk SUA operations.

Registration, training and assessment requirements

2.22 Under the SUA Order, training organisations and bodies intending to deliver advanced training may apply to CAD to become SUA ATOs. According to CAD's guidelines, the approved training courses offered by SUA ATOs should be conducted in Hong Kong and consist of the following parts:

- (a) theoretical knowledge instruction;
- (b) theoretical knowledge examination;
- (c) practical training; and
- (d) practical assessment.

2.23 Remote pilots intending to conduct Advanced Operations are generally required to complete the CAD-approved advanced training and assessment in order to obtain the necessary qualifications under the SUA Order (i.e. advanced rating assigned by CAD). According to CAD, in the period from 1 June 2022 to 30 June 2024, the 8 SUA ATOs (see para. 1.5(b)) had conducted 155 advanced training courses, and 1,854 students had completed such courses.

Assessment of initial applications and renewal applications for SUA ATO

2.24 ***Initial application.*** According to CAD's guidelines, to become an SUA ATO, an applicant is required to submit the application form together with the following information:

- (a) organisation information (e.g. registered address and organisation registration documents);
- (b) a list of key personnel and instructional staff, and their resumes;
- (c) address and a description of facilities for delivering the training course;
- (d) a list of training SUA to be used on course and their corresponding information;

Registration, training and assessment requirements

- (e) course-related documentations (e.g. course syllabus, policy on attendance and examination question bank); and
- (f) descriptions of key internal control systems, including quality assurance system, safety assurance system, document control system and records keeping system.

Upon receipt of an initial application, CAD will review the application package in accordance with the requirements published in its requirements document, with special attention and deliberation given to 11 key areas (Note 8). Having reviewed all the submitted documents, CAD will normally make contact with the applicant within 14 working days on receipt of submission to provide initial feedback. The initial feedback may contain preliminary findings and/or observations on the readiness of the application with a request to the applicant for further information or clarification where required. When preliminary findings and/or observations have been addressed satisfactorily and the desktop audit has been completed, CAD will notify the applicant for arranging a venue audit to ensure that the application is in compliance with the requirements set out in the requirements document. An approval in principle (Note 9) will be granted if there is no finding identified during the venue audit or the findings have been addressed by the applicant. CAD will then conduct an on-site course assessment of the first course offered by the applicant. Once CAD is satisfied that the applicant and the training course meet the stipulated requirements, a final approval will be granted to the applicant.

2.25 *Renewal application.* According to CAD's guidelines, a renewal application should be submitted to CAD 60 calendar days prior to the expiry of the existing approval to allow adequate time for CAD to complete necessary

Note 8: *According to CAD, the 11 key areas are: (a) the organisation's capability in providing course in Hong Kong; (b) agreement and arrangement of contract-out activities; (c) mode and content of theoretical knowledge instruction; (d) integrity of examination; (e) location and set-up arrangement for practical training and assessment; (f) qualifications of instructors and practical assessors; (g) quality assurance system; (h) safety assurance system; (i) occurrence report and handling; (j) record management; and (k) course materials.*

Note 9: *After obtaining the approval in principle from CAD, the applicant can proceed to advertise its training courses and arrange admission of students. CAD will continue to assess the application (e.g. theoretical and practical training and assessment) and only issue the approval upon satisfactory assessment of all the required aspects.*

pre-inspection work (including a review of the organisation's documentation), make arrangements for inspections/audits and complete the relevant post-inspection tasks. Upon receipt of the renewal application, CAD will review the application package (e.g. relevant information for any changes as compared with the initial application) and arrange for an on-site audit. Approval will be granted if there is no finding identified during the on-site audit or the findings have been addressed by the pertinent SUA ATO.

2.26 ***Validity of approvals.*** According to CAD, an approval is normally valid for a maximum period of two years, except for a first-time applicant, for which the approval is normally valid for a maximum period of one year.

Need to improve assessment of initial applications and renewal applications

2.27 As at 30 June 2024, besides the 8 SUA ATOs (see para. 1.5(b)), 1 SUA ATO had obtained the approval in principle (see Note 9 to para. 2.24) granted by CAD. Audit sample check of 10 applications (involving 6 initial applications and 4 renewal applications submitted by 6 SUA ATOs) approved in the period from 1 June 2022 to 30 June 2024 revealed room for improvement in the assessment of initial applications and renewal applications, as follows:

- (a) ***Checklist for audits not updated.*** With a view to facilitating the conduct of desktop audits, venue audits, on-site course assessments and on-site audits by CAD officers in the assessment of initial applications and renewal applications, an internal checklist had been devised by CAD. Audit noted that in October 2023, CAD promulgated a number of updated and additional requirements, including:
 - (i) shortening the time for reporting full details of accidents and incidents upon occurrence to CAD by SUA ATOs from within 3 calendar days to within 24 hours;
 - (ii) ensuring students normally start the practical training after passing the theoretical knowledge examination; and

Registration, training and assessment requirements

- (iii) ensuring that the two-hour flights as remote pilots within the past 12 months are logged before the students are recommended to CAD for the assignment of advanced rating.

However, the checklist had not been updated accordingly to facilitate the audits conducted by CAD officers. For example, in 1 of the 2 applications approved by CAD in the period from November 2023 to June 2024, the deficiency in the applicant's stipulated procedures for reporting accidents and incidents to CAD within 3 calendar days, instead of 24 hours, could not be identified during the desktop audit and brought to the attention of the applicant for revising the pertinent procedures;

- (b) ***Experience and qualifications of instructors and practical assessors not verified.*** In its guidelines, CAD sets out requirements on minimum acceptable experience and qualifications of instructors and practical assessors (e.g. completion of a course of practical assessment). According to the application form, applicants are required to submit documentary proof of the qualifications and experience of instructors and practical assessors as part of the application. Of the 10 applications, Audit noted that in 6 (60%) applications (involving 4 SUA ATOs), while the concerned SUA ATOs had submitted resumes of their instructors and practical assessors, the submissions did not contain any supporting documents (e.g. certificates of courses attended and reference letters for previous work experience) to support the resumes submitted. However, there was no documentary evidence showing that CAD had followed up with the concerned SUA ATOs before granting approvals to them;
- (c) ***Number of questions for each theoretical knowledge examination paper not specified in application.*** According to CAD's guidelines, each theoretical knowledge examination paper should contain at least 48 multiple-choice questions and the time limit for each question should be 75 seconds. Audit noted that in 1 (10%) application, CAD accepted the 90-minute examination of the applicant. However, the number of questions for each theoretical knowledge examination paper was not stated in the application. The time limit for each question was thus uncertain. However, there was no documentary evidence showing that CAD had followed up with the concerned SUA ATO; and

Registration, training and assessment requirements

- (d) ***Inadequacies in vetting guidance documents on reporting procedures and handling of occurrences.*** According to CAD's guidelines, each SUA ATO should provide clear guidance on the reporting procedures (e.g. the reporting time frame and reporting line) and handling of occurrences (e.g. accidents). Audit examined the guidance documents submitted in the 10 applications and noted that:
- (i) in 1 (10%) application, the guidance document submitted had not covered the reporting procedures and handling of occurrences; and
 - (ii) in 3 (30%) applications (involving 2 SUA ATOs), the reporting procedures in the guidance documents submitted had not specified the reporting time frame and reporting line.

However, there was no documentary evidence showing that CAD had followed up with the concerned SUA ATOs before granting approvals to them.

2.28 In September 2024, CAD informed Audit that:

- (a) regarding paragraph 2.27(a), the application concerned was approved by CAD in principle and was in the process of obtaining CAD's final approval as at 30 June 2024;
- (b) regarding paragraph 2.27(b), CAD considered that the responsibilities to verify the declared qualifications and working experiences rested with the employers (i.e. SUA ATOs) of instructors and practical assessors. CAD would request ATOs to provide further proof when in doubt (e.g. upon receipt of intelligence on the authenticity of the submissions); and
- (c) regarding paragraph 2.27(c), the application was still in the process of obtaining CAD's final approval as at 30 June 2024. No actual examination had been conducted and CAD had planned for an inspection on the examination before issuing the final approval. In the future, CAD would ensure that all requirements were documented in the applicant's guidance document before granting the final approval to the concerned training organisation.

Registration, training and assessment requirements

2.29 With a view to upholding the standard of SUA ATOs and ensuring that they fully comply with the requirements of CAD, CAD needs to improve the assessment of initial applications and renewal applications, including:

- (a) updating the checklist for assessment of applications with reference to the updated and additional requirements for SUA ATOs in a timely manner; and
- (b) reminding staff of CAD to exercise due care in checking the submissions of applicants, including:
 - (i) the number of questions for each theoretical knowledge examination paper; and
 - (ii) the guidance documents on the reporting procedures and handling of occurrences.

Continued oversight audits on SUA ATOs

2.30 According to CAD's guidelines:

- (a) continued oversight audits on SUA ATOs may be conducted on a periodic basis by CAD or as required by CAD on an announced or unannounced basis. The audits will focus on the effectiveness of the training, compliance with the procedures and requirements, and quality and safety assurance systems. During such audits, CAD may interview any staff or students, make any inspection or observe actual theoretical knowledge instruction and practical training, theoretical knowledge examination and practical assessment as necessary to assess the compliance with the relevant requirements by SUA ATOs;
- (b) when objective evidence is identified by the case officer showing non-compliance with the applicable requirements during a continued oversight audit, a finding will be issued to the concerned SUA ATO; and

- (c) after receiving the findings from CAD, the pertinent SUA ATO should define a corrective action plan and implement corrective actions to the satisfaction of CAD within a period accepted by CAD.

Need to consider conducting continued oversight audits on unannounced basis

2.31 From 1 June 2022 to 30 June 2024, CAD conducted 2 continued oversight audits on 2 SUA ATOs. According to CAD's guidelines, continued oversight audits on SUA ATOs may be conducted on an announced or unannounced basis (see para. 2.30(a)). Audit examined the records of these 2 continued oversight audits and noted that they were all conducted on an announced basis (i.e. pre-arranged visits to SUA ATOs). With a view to enhancing the effectiveness of continued oversight audits, CAD needs to consider conducting continued oversight audits on an unannounced basis as far as practicable.

Audit recommendations

2.32 **Audit has *recommended* that the Director-General of Civil Aviation should:**

- (a) **improve the assessment of initial applications and renewal applications for SUA ATOs, including:**
 - (i) **updating the checklist for assessment of applications with reference to the updated and additional requirements for SUA ATOs in a timely manner; and**
 - (ii) **reminding staff of CAD to exercise due care in checking the submissions of applicants, including the number of questions for each theoretical knowledge examination paper and the guidance documents on the reporting procedures and handling of occurrences; and**
- (b) **consider conducting continued oversight audits on SUA ATOs on an unannounced basis as far as practicable.**

Response from the Government

2.33 The Director-General of Civil Aviation generally agrees with the audit recommendations. He has said that CAD:

- (a) has updated the checklist to facilitate staff to conduct assessment;
- (b) has reminded staff to follow up with the concerned SUA ATOs on examination paper and the relevant guidance documents; and
- (c) will consider formulating a mechanism to conduct continued oversight audits on SUA ATOs on an unannounced basis as far as practicable.

PART 3: ADVANCED OPERATIONS PERMISSION AND INSURANCE REQUIREMENTS

3.1 This PART examines the work of CAD in granting permission for Advanced Operations and implementing the insurance requirements under the SUA Order, focusing on:

- (a) AOP (paras. 3.2 to 3.20); and
- (b) insurance requirements (paras. 3.21 to 3.28).

Advanced Operations permission

3.2 According to CAD, due to the higher risks involved, Advanced Operations (see para. 1.4(b)(ii)) shall be subject to more stringent safety and regulatory requirements specified in the SUA Order and the Safety Requirements Document.

3.3 According to CAD's guidelines, depending on the nature and complexity of the Advanced Operations, and capability and experience of the SUA operators, AOP granted by CAD may be of the following types:

- (a) an AOP covering a specific type of Advanced Operations (Note 10) only for a specified period of time;
- (b) an AOP covering a specific range of Advanced Operations (Note 11) for a specified period of time; and

Note 10: *The specific types of Advanced Operations include: (a) night operations on a longer-term basis; (b) extended visual line of sight operations; (c) building survey/inspection operations; (d) aerial survey or aerial photography operations; and (e) heavy SUA operations.*

Note 11: *According to CAD's guidelines, applications may be made for any one or more than one of the specific types of operations. However, in any one flight, only one type of Advanced Operations should be involved, unless otherwise specified by CAD in the pertinent AOP.*

Advanced Operations permission and insurance requirements

- (c) an AOP covering a specific and individual event-based operation for a specified period of time and location (Note 12).

3.4 According to CAD's guidelines, applications for AOP will only be processed if the applicants are considered fit and capable of conducting the specific types of Advanced Operations in Hong Kong safely. The applicants may be required to provide the proof of experience and competency in conducting the specified operations. Subject to the complexity of the proposed operations, prior to the issuance of AOP, CAD may require the applicants to perform flight demonstrations (Note 13) for assessing their capabilities and abilities to comply with the operating and emergency procedures prescribed in their operations manuals. The maximum validity period of an AOP is up to six months for new applications and up to two years for renewal applications. As of June 2024, there were about 100 AOP holders (see para. 1.7).

Monitoring of AOP holders

3.5 ***Surveillance programme.*** According to CAD's guidelines, an AOP holder will be subject to CAD's oversight through a surveillance programme so as to ensure the AOP holder's continuous compliance with the applicable regulatory requirements and AOP conditions. The surveillance programme for AOP holders comprises the following:

- (a) flight demonstrations for initial applications for AOP or any high-risk/novel operations;

Note 12: *According to CAD's guidelines, in order to facilitate and cater for one-off specific operation, applications may be made for specific night operations. Besides, taking into consideration the vastly different operating environments and the risks posed on the aviation and public safety, drone show operations (i.e. the display of multiple SUA controlled collectively by a dedicated flight management system in a coordinated manner) or drone racing operations will normally only be considered on an individual event basis.*

Note 13: *According to CAD, during a flight demonstration, CAD will review the flight documents and walk through the key regulatory requirements with the applicant.*

Advanced Operations permission and insurance requirements

- (b) scheduled oversight audits based on safety risk analysis (Note 14); and
- (c) ad-hoc inspections upon CAD's request.

3.6 ***Scheduled oversight audits.*** According to CAD's guidelines, AOP holders will be subject to CAD's scheduled oversight audits at least once within the AOP validity period (Note 15). There are two types of audits:

- (a) ***Documentation review.*** The documentation review covers an administrative review of documents (e.g. operations manual, list of SUA and remote pilots, etc.) maintained by the AOP holders and a random sample check on the completeness of the documents and records in relation to each flight. A documentation review is normally conducted for SUA operators which have been issued with AOP for the first time (Note 16); and
- (b) ***Documentation review cum operational flight check.*** Under a documentation review cum operational flight check, besides the documentation review, an operational flight check will also be conducted to check the compliance with relevant AOP conditions and procedures prescribed in the operations manual during a flight operation. A documentation review cum operational flight check is conducted for SUA operators which have completed the first AOP renewal applications.

Note 14: *According to CAD, in order to facilitate the industry to perform SUA operations while ensuring aviation and public safety, a risk-based approach is adopted in determining the audit schedule, taking into account the number of AOP holders (i.e. some 100 as of June 2024). Under the risk-based approach, the safety risk of an AOP holder is derived from its operation frequency, types of Advanced Operations permitted, preceding audit results/non-compliance records and the history of occurrence.*

Note 15: *According to CAD's guidelines, scheduled oversight audits are not required for one-off event-based AOP for drone show operations or drone racing operations. It is because the related competency should have been assessed to the satisfaction of CAD before the issuance of AOP.*

Note 16: *According to CAD, operational flight check is normally not required for the first AOP renewal (i.e. six months after the issue of the first AOP) as flight demonstrations would have been recently conducted before the first AOP issuance.*

Advanced Operations permission and insurance requirements

According to CAD's guidelines, renewal applications for AOP will be considered based on the previous performance under the surveillance programme. In particular, an AOP will only be renewed if a scheduled oversight audit has been performed in the past 12 months and when all findings identified in scheduled oversight audits have been duly addressed.

3.7 *Validity extension exercise.* According to CAD, in January and February 2024, taking into account the experience of implementing the AOP regime and the limited manpower to handle the increasing workload associated with the increase in AOP holders, CAD has extended the validity period of all the existing AOP granted for renewal applications from 1 year to 2 years (see para. 3.4).

Need to take measures to ensure that all AOP holders are subject to scheduled oversight audits at least once within AOP validity periods

3.8 As mentioned in paragraph 3.6, AOP holders will be subject to CAD's scheduled oversight audits at least once within the AOP validity period. According to CAD records, 94 AOP granted for initial applications and renewal applications (Note 17) by CAD had expired on or before 30 June 2024. Audit analysed the records of scheduled oversight audits of these 94 cases and noted that for some cases, scheduled oversight audits had not been conducted at least once within their AOP validity periods, as follows:

- (a) no scheduled oversight audit had been conducted for 9 (10%) cases. In particular, of the 9 cases, the subsequent renewal of AOP of 2 cases had been granted by CAD. This was contrary to CAD's guidelines that an AOP will only be renewed if a scheduled oversight audit has been performed in the past 12 months; and
- (b) for 11 (12%) cases, instead of within the respective validity periods, the scheduled oversight audits were conducted after the expiry of the respective AOP, ranging from 2 to 43 days.

Note 17: *The number did not include: (a) AOP for drone show operations or drone racing operations (see Note 15 to para. 3.6); and (b) a case in which the AOP had been surrendered by the AOP holder before expiry.*

Advanced Operations permission and insurance requirements

- 3.9 In September 2024, CAD informed Audit that:
- (a) regarding the 9 cases mentioned in paragraph 3.8(a):
 - (i) 5 cases involved one-off night operations which were considered on case-by-case basis and hence scheduled oversight audits were not applicable;
 - (ii) in 2 cases, although no SUA operation was conducted during the first AOP validity period, other monitoring method (e.g. checking of monthly flight summary — Note 18) was conducted before the renewal;
 - (iii) in 1 case, the AOP was not renewed as the applicant did not raise a renewal request; and
 - (iv) in 1 case, the AOP holder was involved in a suspected violation case. CAD had followed up with the AOP holder and requested for information relevant to the suspected violation. Despite CAD's repeated calls and reminders, submission from the AOP holder was either outstanding or unsatisfactory. The AOP eventually expired. CAD had also explicitly reminded the AOP holder that CAD would not consider any renewal request until the corrective actions had been completed; and
 - (b) regarding the 11 cases mentioned in paragraph 3.8(b), CAD had informed the AOP holders of the scheduled oversight audit arrangements before the end of the respective validity periods. However, the scheduled oversight audits were conducted after the expiry of the respective AOP due to operational factors, for example, availability of flight operations or the AOP holders.

3.10 Audit notes that scheduled oversight audits play a crucial part in CAD's surveillance programme for AOP holders (see para. 3.5). With a view to enhancing the monitoring of AOP holders, Audit considers that CAD needs to take measures to

Note 18: *According to CAD, an AOP holder is required to provide a monthly flight summary by email.*

Advanced Operations permission and insurance requirements

ensure that all AOP holders are subject to scheduled oversight audits at least once within their AOP validity periods and consider establishing procedures in handling cases where scheduled oversight audits cannot be conducted due to operational factors. Moreover, CAD needs to remind its staff to, as far as practicable, adhere to the guidelines that an AOP will only be renewed if a scheduled oversight audit has been performed in the past 12 months and when all findings identified in scheduled oversight audits have been duly addressed.

Need to maintain inspection records on self-assessment records of AOP holders when conducting scheduled oversight audits

3.11 According to CAD's guidelines:

- (a) as quality assurance, an AOP holder should, as a minimum, conduct a self-assessment covering all aspects of operations at least once every six months with a view to identifying any internal deficiencies and procedures that have not been properly implemented or that require further enhancement;
- (b) self-assessment records will be subject to CAD's inspection during scheduled oversight audits and renewal applications of AOP; and
- (c) a sample self-assessment checklist is provided to facilitate the AOP holders to perform their internal quality assurance activities. AOP holders may design their own checklists in accordance with the requirements as specified in the relevant documents. The content of the self-assessment will be inspected by CAD under the surveillance programme.

Audit noted that the checklist (Note 19) devised for conducting scheduled oversight audits did not cover the inspection of self-assessment records.

3.12 Audit sample check of the scheduled oversight audits conducted for 10 cases revealed that:

Note 19: *According to CAD, the checklist covered 54 items.*

Advanced Operations permission and insurance requirements

- (a) in 6 (60%) cases, there was no documentary evidence showing that CAD staff had inspected the self-assessment records; and
- (b) in 1 (10%) case, while the pertinent AOP holder should have conducted two self-assessments during the one-year AOP validity period, only one self-assessment record had been inspected by CAD staff. According to CAD, it was a sample check.

3.13 In Audit's view, CAD needs to remind its staff to maintain inspection records on self-assessment records of AOP holders when conducting scheduled oversight audits with a view to ensuring that any internal deficiencies in AOP holders' operations are addressed in a timely manner. Moreover, with a view to facilitating the inspection of self-assessment records, CAD should revise the checklist for scheduled oversight audits.

Time intervals between expiry of AOP and approvals granted for renewal applications

3.14 According to CAD's guidelines, for AOP covering a specified period of time, the AOP holder may make an application to renew the pertinent AOP. Such an application should be submitted at least 30 calendar days prior to the expiry of the existing AOP (i.e. the specified date for submission of renewal applications).

3.15 Of the 79 renewal applications for AOP approved by CAD as at 30 June 2024, Audit noted that there were time intervals, ranging from 1 day to 270 days, between the expiry dates of the previous AOP and the effective dates of the renewed AOP for 47 (59%) cases (see Table 5).

Table 5

**Time intervals between expiry dates of previous AOP
and effective dates of renewed AOP
(30 June 2024)**

Time interval (days)	Number of cases
Nil	32 (40.5%)
1 to 14	20 (25.3%)
15 to 28	8 (10.1%)
29 to 42	9 (11.4%)
43 to 56	1 (1.3%)
More than 56	9 (11.4%) (Note)
Total	79 (100.0%)

47 (59%)

Source: Audit analysis of CAD records

Note: There were four cases with time intervals over 90 days, ranging from 101 to 270 days.

3.16 Of the 47 cases with time intervals between the expiry dates of the previous AOP and the effective dates of the renewed AOP, Audit noted that in 43 (91%) cases, the renewal applications were not submitted to CAD at least 30 calendar days prior to the expiry of the previous AOP (see para. 3.14), with delays ranging from 1 day to 183 days. Audit examined the 3 cases with delays in the submission of renewal applications to CAD for over 90 days and found that:

- (a) in 1 case, no reminder had been sent to the concerned AOP holder. In the remaining 2 cases, while reminders had been sent to the concerned AOP holders, they were sent after the specified date for submission of renewal applications (i.e. 30 calendar days prior to the expiry of the previous AOP); and
- (b) as mentioned in paragraph 3.6, an AOP will only be renewed if a scheduled oversight audit has been performed in the past 12 months and when all findings identified in scheduled oversight audits have been duly addressed.

Advanced Operations permission and insurance requirements

However, in 2 cases, the scheduled oversight audits were conducted by CAD after the validity periods of the respective AOP and thus the findings of the scheduled oversight audits were only duly addressed by the AOP holders 90 and 103 days after the expiry dates of the previous AOP.

3.17 In September 2024, CAD informed Audit that:

- (a) while the 30 calendar days stated in the guidelines could be considered as an obligation of the AOP holders in AOP renewal process rather than a deadline for submission, as a facilitator, CAD adopted a general practice to issue a reminder as appropriate to the AOP holders prior to the expiry of their respective AOP;
- (b) whether to submit renewal applications and whether to pursue a seamless renewal depended on the business needs and commercial decisions of the AOP holders. CAD would facilitate and handle the applications even if the applications were not submitted 30 days in advance; and
- (c) the conduct of scheduled oversight audits would be subject to operational factors, such as availability of flight operations or the AOP holders.

3.18 Audit notes that the AOP holders are generally commercial organisations in the fields of aerial photographing, surveying/inspection, etc. As no Advanced Operations should be conducted after the expiry of AOP, it is important that their AOP is renewed in a timely manner so that their business operations would not be interrupted. With a view to ensuring that AOP of holders with a continued need to conduct Advanced Operations is renewed in a timely manner, CAD needs to consider formalising the practice of issuing reminders to AOP holders before the specified date for submission of renewal applications. Moreover, CAD needs to take into account the time required for arranging and completing the scheduled oversight audits and AOP holders to address the findings when planning the schedule for conducting scheduled oversight audits.

Audit recommendations

3.19 **Audit has *recommended* that the Director-General of Civil Aviation should:**

- (a) **take measures to ensure that all AOP holders are subject to scheduled oversight audits at least once within their AOP validity periods and consider establishing procedures in handling cases where scheduled oversight audits cannot be conducted due to operational factors;**
- (b) **remind the staff of CAD to, as far as practicable, adhere to the guidelines that an AOP will only be renewed if a scheduled oversight audit has been performed in the past 12 months and when all findings identified in scheduled oversight audits have been duly addressed;**
- (c) **remind the staff of CAD to maintain inspection records on self-assessment records of AOP holders when conducting scheduled oversight audits;**
- (d) **revise the checklist for scheduled oversight audits with a view to facilitating the inspection of self-assessment records;**
- (e) **consider formalising the practice of issuing reminders to AOP holders before the specified date for submission of renewal applications; and**
- (f) **take into account the time required for arranging and completing the scheduled oversight audits and AOP holders to address the findings when planning the schedule for conducting scheduled oversight audits.**

Response from the Government

3.20 The Director-General of Civil Aviation generally agrees with the audit recommendations. He has said that:

- (a) CAD will continuously enhance internal procedures to handle odd cases and facilitate the industry by formalising the issuance of reminders for renewal applications;

Advanced Operations permission and insurance requirements

- (b) CAD has updated the checklist to facilitate staff to conduct assessments and reminded staff accordingly; and
- (c) Audit's recommendations in respect of planning and completing scheduled oversight audits will be taken into account in the process.

Insurance requirements

Need to keep in view market readiness for rolling out insurance products for Category A2 Operations

3.21 ***Phased approach.*** According to CAD, in July 2021, when enacting the SUA Order for commencement on 1 June 2022, having considered that Hong Kong was densely populated and in view of the potential risks that SUA might pose to third parties, insurance requirements in respect of third party liability for bodily injury and/or death were imposed for SUA for Category A2 Operations and Advanced Operations. The minimum coverage for Category A2 Operations and Advanced Operations were set at \$5 million and \$10 million respectively. After balancing the market readiness situation and risks to public safety, a phased approach in setting the timing for the mandatory insurance requirements was adopted, as follows:

- (a) the first phase was mandatory insurance for Advanced Operations, which took effect immediately upon commencement of the SUA Order; and
- (b) the second phase will be mandatory insurance for Category A2 Operations, which will commence on a later date to be specified by the Director-General of Civil Aviation by notice published in the Gazette.

With a view to allowing time for CAD to continue its liaison meeting with the insurance industry and for the insurance industry to collect more information/statistics in relation to the use of SUA in Hong Kong under the SUA Order such that the industry can formulate SUA-related insurance products with more competitive premium and flexible choices of duration, CAD planned to conduct a review on the implementation of the first phase requirement and readiness for commencement of the second phase requirement after the SUA Order had commenced operation for a year.

Advanced Operations permission and insurance requirements

3.22 *Survey on insurance requirements.* In March 2023, CAD commissioned a tertiary education institution to conduct a survey (Note 20) on the public use of SUA in Hong Kong with a view to, among others, collecting public views on different aspects (e.g. feedback on availability of third party insurance products in the market and the acceptable premium levels for such products) for the review on insurance requirements. According to CAD, the survey reflected that the readiness of the SUA operators and the insurance market in offering sufficient choices of third party insurance products for Category A2 Operations had yet to be developed.

3.23 *Follow-up actions for implementing insurance requirements in coordination with the Transport and Logistics Bureau (TLB).* In November 2023, taking into consideration the results of the survey, CAD submitted to TLB a review on insurance requirements under the SUA Order. In March 2024, TLB responded to CAD's submission and further coordinated with CAD to take the following actions:

- (a) conducting a comprehensive review in early 2025 on the implementation of the SUA Order, including the mandatory insurance requirements for Category A2 Operations. When conducting the comprehensive review, due consideration should be given to any new development and the evolving international practices on mandatory insurance requirements in jurisdictions outside Hong Kong, as well as the latest development regarding the regulatory issues for unmanned aircraft system (including the heavier and more complex ones) in different domains;
- (b) depending on the market readiness situation as reflected by the comprehensive review, taking forward the implementation of the second phase of insurance requirements;
- (c) continuing to gather data regarding the usage of SUA and SUA-related incidents for sharing with the insurance industry; and
- (d) exploring possible ways to inject impetus to the market with a view to making it more ready for taking out insurance for Category A2 Operations.

Note 20: *According to CAD, 21 questions were included in the survey to gauge respondents' use patterns of SUA and their views on insurance, publicity and the regulatory regime in general. 4,301 respondents were covered by the survey.*

Advanced Operations permission and insurance requirements

3.24 *Liaison with insurance industry.* According to CAD, regarding the implementation of insurance requirements under the SUA Order, CAD has all along liaised closely with the insurance industry. Regular meetings have been held between CAD and the insurance industry since 2019. Audit noted that in May 2024, CAD had a meeting with the insurance industry to, among others, share the results of the survey (see para. 3.22).

3.25 In September and October 2024, regarding the follow-up actions in coordination with TLB, CAD informed Audit that:

- (a) CAD had been making continual liaison with the insurance industry;
- (b) since July 2024, CAD had been engaged in various preparatory work with a view to conducting a survey in 2025 and in September 2024, CAD had communicated with potential service providers for conducting the survey; and
- (c) CAD would continue to keep in view the market readiness for rolling out insurance products for Category A2 Operations.

3.26 Audit noted that while the SUA Order had commenced on 1 June 2022, the readiness of the SUA operators and the insurance market in offering sufficient choices of third party insurance products for Category A2 Operations had yet to be developed (see para. 3.22).

Audit recommendation

3.27 **Audit has recommended that the Director-General of Civil Aviation should keep in view the market readiness for rolling out insurance products for Category A2 Operations and take forward the implementation of the second phase of insurance requirements when the SUA operators and insurance market are ready.**

Response from the Government

3.28 The Director-General of Civil Aviation generally agrees with the audit recommendation. He has said that since TLB responded to CAD's submission on the review of insurance requirements in March 2024, CAD has planned and taken, and will continue to take forward, various actions (such as engaging the insurance industry and communicating with potential service providers for a survey in 2025) to gauge the market readiness for the implementation of the second phase of insurance requirements.

PART 4: OTHER RELATED ISSUES

4.1 This PART examines other issues relating to the regulation of operations of SUA, focusing on:

- (a) handling of cases of suspected violations of SUA Order (paras. 4.2 to 4.10);
- (b) publicity and education (paras. 4.11 to 4.20); and
- (c) expanded applications of SUA (paras. 4.21 to 4.26).

Handling of cases of suspected violations of Small Unmanned Aircraft Order

4.2 According to CAD:

- (a) it started to develop its capacity in carrying out the enforcement duties under the SUA Order since early 2022. The enforcement duties in relation to the SUA Order were mainly carried out by two Operations Officers and supervised by a Senior Operations Officer on top of their other assigned duties of the Unmanned Aircraft Office (e.g. handling AOP and SUA ATO applications, etc.);
- (b) in addition to the internal preparation including development of policy and documentation, staff training and facilities set-up, the responsible officers have also been in close liaison with other relevant government departments to facilitate the implementation of enforcement actions under the SUA Order; and
- (c) protocol and procedures were established to facilitate communication, case handling and referral, technical assistance, investigation and advice seeking among the relevant government departments. Such protocol and procedures have been under review and continuously refined as the implementation of the SUA Order evolved.

Other related issues

4.3 CAD devised a set of guidelines on the handling of suspected violations of the SUA Order in April 2024. According to the guidelines:

- (a) **Source of suspected violations.** In addition to CAD's intelligence sources, the Hong Kong Police Force (HKPF) refers cases of suspected violations of the SUA Order to CAD for taking follow-up actions in accordance with the delineation of responsibilities agreed between CAD and HKPF (Note 21);
- (b) **Handling procedures.** The handling procedures are as follows:
 - (i) upon receipt of a case of suspected violations by CAD, the subject officer should conduct preliminary checks to ensure the accuracy and sufficiency of the submitted information and documents;
 - (ii) after conducting preliminary checks, the subject officer should conduct detailed investigation into the case by collecting relevant information and evidence as far as possible; and
 - (iii) after thorough assessment of all the available information and evidence, the subject officer should recommend the appropriate enforcement actions for review and endorsement by senior officers; and
- (c) **Enforcement actions.** Depending on the types and seriousness of the offences and circumstances of the cases, CAD may take actions ranging from issuance of warnings/safety direction, suspension or revocation of registration/permission/rating/approval, etc. to prosecution in court.

Note 21: *Enforcement powers under the SUA Order can be exercised by both CAD and HKPF as authorised officers. According to CAD, in May 2022, it was agreed with HKPF that certain types of cases will be handled by HKPF. As at 30 June 2024, there were 11 cases handled by HKPF.*

Need to expedite handling of cases of suspected violations as far as practicable

4.4 According to CAD, as at 30 June 2024, while 13 cases of suspected violations of the SUA Order had been concluded, the investigation of 25 cases were in progress. Of the 25 cases in progress, Audit noted that 14 (56%) cases had been received by CAD for handling for more than 180 days (see Table 6).

Table 6
Ageing analysis of cases in progress
(30 June 2024)

Time elapsed since receipt (Number of days)	Number of cases	Percentage
90 or less	4	16%
91 to 180	7	28%
181 to 365	7	28%
More than 365	7 } 14	28% } 56%
Total	25	100%

Source: Audit analysis of CAD records

Remarks: According to CAD, in handling cases of suspected violations, it has to liaise with various authorities and government departments. The time required to seek advice and further advice from, or complete relevant procedural process in coordination with various authorities and government departments may not be as manageable as anticipated by CAD at times.

4.5 According to CAD:

- (a) for each case, CAD will mark the key milestones (e.g. the continual investigation, internal review meetings and discussions) of case progress in a master summary log during the respective investigation period; and

Other related issues

- (b) no detailed record in writing about the investigation process and internal review meetings/discussions is maintained.

4.6 Audit examined the case files of the 14 cases that had been received by CAD for handling for more than 180 days and noted that in 8 (57%) cases, the relevant key milestones showed that after collecting the relevant information and evidence, CAD took more than 3 months, ranging from 108 to 165 days, to proceed to the next follow-up actions.

4.7 In September 2024, CAD informed Audit that:

- (a) each case of suspected violations involved detailed investigation, evidence collection and handling, careful analysis on evidence, multi-tier endorsements and enforcement actions irrespective of their nature and seriousness. Apart from CAD officers, communication with, and support and advice from various authorities and government departments were important to ensure that cases could be proceeded in an appropriate manner, in particular those leading to legal proceedings;
- (b) the 8 cases mentioned in paragraph 4.6 were not left idle during the periods of 108 to 165 days. Thorough investigation was carried out after collection of relevant information and evidence, which was not practicable to be recorded in writing. Internal meetings and discussions were also conducted during the periods and recorded as the key milestones; and
- (c) for manpower deployment, the priority was usually given to more time-critical tasks, including those supporting the increasing day-to-day use of SUA under the SUA Order (e.g. processing of AOP applications).

4.8 With a view to meeting future challenge, CAD needs to conduct a strategic review on future manpower deployment, having regard to the work duties in relation to the SUA Order. Moreover, CAD needs to expedite the handling of cases of suspected violations as far as practicable.

Audit recommendations

4.9 **Audit has recommended that the Director-General of Civil Aviation should:**

- (a) **conduct a strategic review on future manpower deployment, having regard to the work duties in relation to the SUA Order; and**
- (b) **expedite the handling of cases of suspected violations as far as practicable.**

Response from the Government

4.10 The Director-General of Civil Aviation generally agrees with the audit recommendations. He has said that in light of the continuous expansion of SUA applications, CAD will continue to review the manpower situation accordingly.

Publicity and education

4.11 According to CAD, legislation apart, publicity and education are equally instrumental to promoting public awareness of the SUA Order and the safety awareness of SUA operations, and reducing the enforcement burden. Examples of CAD's efforts in this regard included:

- (a) launching a series of publicity and public relations campaigns on SUA operations, including Announcements in the Public Interest on television and audio on radio, posters, leaflets, online promotional videos and briefings for stakeholders from different sectors;
- (b) conducting joint publicity campaigns with HKPF on various hotspots of SUA operations in Hong Kong by distributing leaflets and explaining the requirements under the SUA Order; and
- (c) publishing useful information (e.g. detailed regulatory requirements and operating requirements for SUA operations) on CAD website and eSUA.

Need to improve monitoring of performance of service providers of promotional campaigns

4.12 According to CAD, in December 2022 and January 2023, it launched a promotional campaign on the SUA Order in various public transport modes at a cost of \$1.2 million. Under the promotional campaign, CAD entered into service contracts with 3 public transport operators for placing advertisement displays on the exterior and interior of buses, bus shelters and tram shelters.

4.13 Audit examination revealed the following:

- (a) the 2 bus operators were required to distribute the displays of advertisements across their service networks, including Hong Kong Island, Kowloon, the New Territories and Lantau Island. According to CAD, it was subsequently noted that 1 bus operator's service network did not cover Lantau Island;
- (b) based on the route list submitted by 1 bus operator:
 - (i) while the service contract required that the advertisements should be displayed at the back of bus seats on at least 38 buses, the route list only contained information on the network coverage of the buses (i.e. 37 bus routes); and
 - (ii) while the service contract required that the advertisements should be displayed at the back of bus seats for 8 weeks, the information on the route list could only show that the advertisements had been displayed for 6 weeks; and
- (c) while the 2 bus operators were required to provide photographs of the advertisement displays on bus exterior and/or interior, photographs of some samples but not all of the advertisement displays had been submitted.

4.14 In September 2024, CAD informed Audit that:

- (a) CAD would take note of the service networks of bus operators in case of similar promotional campaigns in the future;

- (b) the route list mentioned in paragraph 4.13(b) was submitted to CAD as a supplementary information. The official invoice issued by the bus operator was checked as the official document for the service provided. According to the official invoice, the advertisements had been displayed at the back of bus seats on 38 buses for 8 weeks; and
- (c) CAD had performed checks on the service providers' compliance with the service contracts through the following means:
 - (i) sample checks via the photographs submitted by the service providers; and
 - (ii) spot checks conducted by CAD staff.

4.15 While the concerned bus operator had only submitted sampled photographs and a supplementary route list to substantiate its compliance with the service contract, there was no documentary evidence showing that CAD had taken any follow-up actions with the bus operator to request additional information or proof before settling the contract payment in full in February 2023. With a view to ensuring that service providers of promotional campaigns have fully delivered the services as required by the service contracts, CAD needs to improve the monitoring of the performance of service providers.

Need to make sustained efforts in arranging publicity and education targeting visitors

4.16 Audit noted that from time to time, there were media reports on breaching the SUA Order by visitors (e.g. flight of SUA within a restricted flying zone without permission and flight of non-registered SUA). For example, in early December 2023 and early July 2024, 3 visitors and 1 visitor were respectively reported to have breached the SUA Order. Moreover, according to CAD, of the 38 cases of suspected violations of the SUA Order handled by CAD (i.e. 13 concluded cases and 25 investigation in progress cases — see para. 4.4), visitors were involved in 13 (34%) cases. These indicated that visitors might not be well aware of the requirements under the SUA Order.

Other related issues

- 4.17 In August and September 2024, CAD informed Audit that:
- (a) based on the enforcement cases, it noted that a number of cases involved visitors; and
 - (b) as such, since August 2023, various publicity events targeting visitors had been organised at different locations. For example, Hong Kong International Airport, Lo Wu Mass Transit Railway Station, Hong Kong West Kowloon High Speed Rail Station and other popular tourist spots, including the Peak, areas along the Victoria Harbour and Sunny Bay Mass Transit Railway Station.

4.18 Audit noted CAD's efforts in organising publicity events targeting visitors. With a view to enhancing the awareness of visitors on the SUA Order, CAD needs to make sustained efforts in arranging publicity and education targeting visitors.

Audit recommendations

- 4.19 **Audit has recommended that the Director-General of Civil Aviation should:**
- (a) **improve the monitoring of the performance of service providers of promotional campaigns; and**
 - (b) **make sustained efforts in arranging publicity and education targeting visitors with a view to enhancing their awareness on the SUA Order.**

Response from the Government

- 4.20 The Director-General of Civil Aviation generally agrees with the audit recommendations. He has said that CAD will:
- (a) continuously enhance internal procedures regarding the monitoring of the performance of service providers of promotional campaigns; and
 - (b) continue its efforts in conducting publicity events targeting visitors.

Expanded applications of small unmanned aircraft

Need to sustain efforts in facilitating wider use of SUA

4.21 In July 2024, concerning expanded applications of SUA, TLB informed the Legislative Council that:

- (a) ***Expanded applications of SUA.*** CAD was working with the industry under the framework of the existing SUA Order to explore ways to further facilitate and widen the applications of SUA, as well as to further expedite the application process by different means. Moreover, TLB and CAD were actively exploring ways to take forward the expanded applications of SUA from the perspective of regulations, technical requirements and airspace management, etc.; and
- (b) ***Implementation of pilot projects.*** As different application scenarios involved different requirements on aircraft loading, flight range, flight duration, operational reliability and safety, the Government would implement pilot projects in a gradual and orderly manner, starting with the transport of goods by unmanned aircraft, and then gradually widening and enriching the application scenarios of unmanned aircraft from the near to the far, and from the light to the heavy.

4.22 According to CAD, as regards the adoption of SUA application by government users:

- (a) for public officers acting on behalf of the Government in exercise of their official duty, CAD has compiled a set of guidelines for user departments such that government flights would be operated in a similar manner as per the regulatory requirements to ensure safe operations of SUA;
- (b) it is stipulated in the guidelines that user departments should develop and obtain CAD's acceptance on their operations manuals detailing the departmental policies, procedures, safety precautions and risk mitigating measures for public officers to safely carry out all envisaged SUA operations that are controlled under the relevant departments; and

Other related issues

- (c) with a view to facilitating the drawing up of operations manuals by user departments, CAD has made available a sample operations manual to user departments on a governmental platform. User departments may suitably adjust the sample operations manual in accordance with their departmental instructions and operational needs.

Under the efforts of CAD, various government departments have been using SUA in numerous areas to enhance work efficiency, for example, using SUA to assist in search and rescue, law enforcement, inspection work, repair and maintenance, surveying and mapping, etc. As at 30 June 2024, there were over 1,000 SUA registered by 31 government bureaux and departments, and 47 operations manuals had been reviewed and accepted by CAD.

4.23 In August 2024, regarding its efforts in proactively supporting the future development of SUA applications, CAD informed Audit that:

- (a) CAD continued its endeavour to proactively support the increasingly wide applications of SUA in Hong Kong. The SUA Order had provided a forward-looking regulatory regime with built-in flexibility so that it could foster the innovative development and applications of SUA in Hong Kong in tandem with evolving technology, while safeguarding aviation and public safety;
- (b) the Unmanned Aircraft Office was dedicated to implementing the SUA Order, with the objective of proactively supporting the industry to operationalise SUA applications. As a facilitator, CAD was working with the industry partners and government users under the framework of the existing SUA Order to explore various ways to further widen the applications of SUA (e.g. beyond-visual-line-of-sight (BVLOS) operations), as well as to further expedite the application process. As a regulator, CAD would continue to ensure aviation and public safety awareness as well as legal compliance associated with SUA applications from the perspectives of regulations, technical requirements and airspace management, etc., taking into account Hong Kong being a densely populated cosmopolitan with high-rise buildings;
- (c) in order to keep abreast of the industry's latest initiatives, CAD maintained close communication with the industry partners and government users. For example, in August 2024, CAD organised technical meetings with the

industry partners to discuss drone delivery proposals involving BVLOS operations. Follow-up meetings with various government departments and industry partners were also arranged so that CAD might provide necessary support; and

- (d) since April 2024, CAD had been in partnership with government departments to conduct pilot schemes on BVLOS operations in order to demonstrate SUA versatility. With a view to understanding the plans of government bureaux and departments on the expanded use of SUA in their operations, in June 2024, CAD proactively reached out to government departments to conduct a survey. The preliminary results of the survey showed that many government departments had plans to expand the use of SUA in their operations (e.g. assisting in water sample collection, measurement of weather elements, etc.).

4.24 Audit notes CAD's efforts in proactively supporting the future development of SUA applications. CAD needs to sustain its efforts in facilitating the wider use of SUA in Hong Kong.

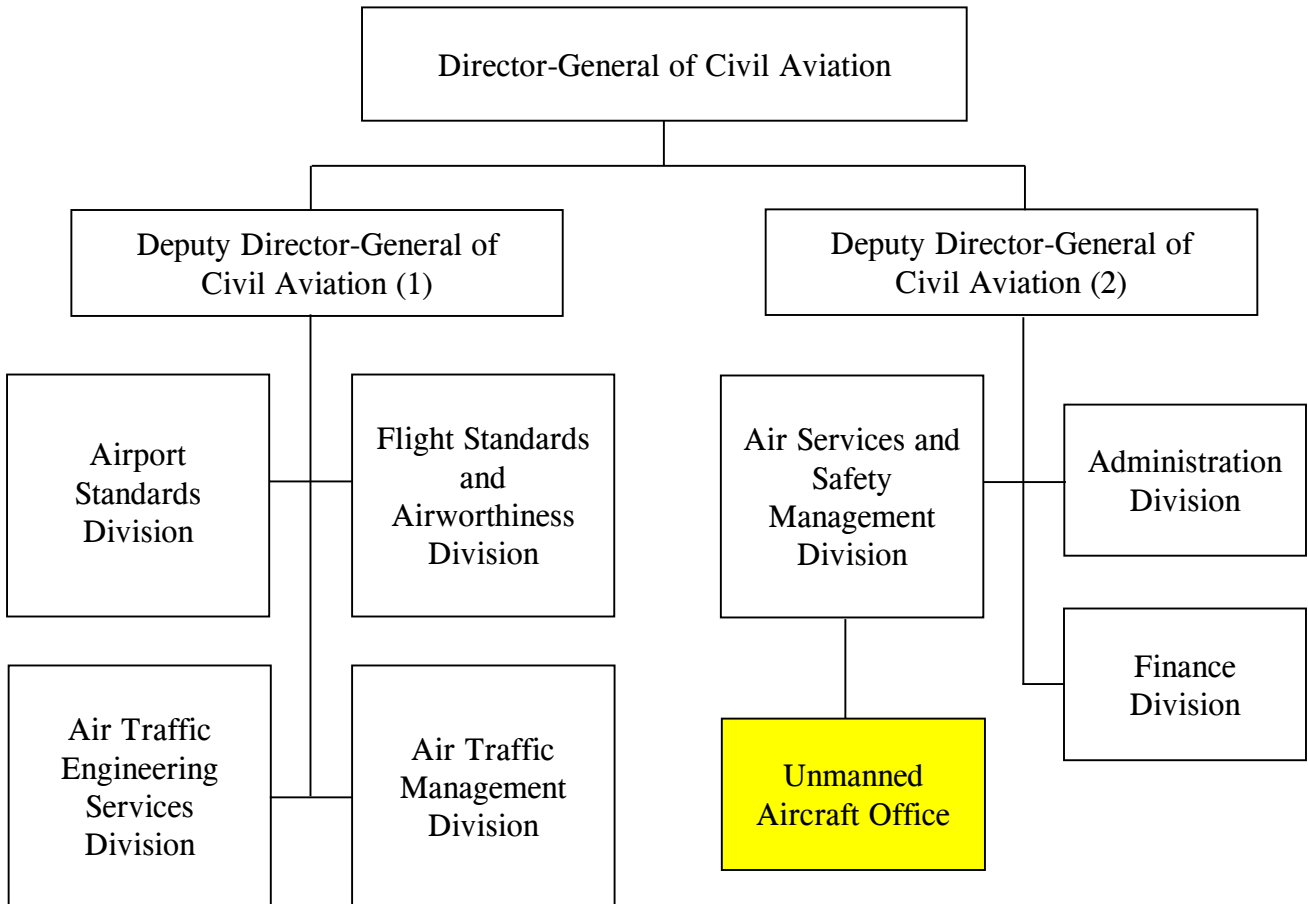
Audit recommendation

4.25 **Audit has *recommended* that the Director-General of Civil Aviation should make sustained efforts in facilitating the wider use of SUA in Hong Kong.**

Response from the Government

4.26 The Director-General of Civil Aviation generally agrees with the audit recommendation. He has said that drawing on the experience of engaging government departments in wider use of SUA during emergency response situations particularly since the second quarter of 2024, CAD will continue its efforts in facilitating the diverse applications of SUA in Hong Kong while safeguarding aviation and public safety.

**Civil Aviation Department:
Organisation chart (extract)
(30 June 2024)**



Legend: The office covered in this Audit Report

Source: CAD records

Acronyms and abbreviations

AOP	Advanced Operations permission
ATO	Approved Training Organisation
Audit	Audit Commission
BVLOS	Beyond-visual-line-of-sight
CAD	Civil Aviation Department
eSUA	Electronic Portal for Small Unmanned Aircraft
HKPF	Hong Kong Police Force
SUA	Small unmanned aircraft
TLB	Transport and Logistics Bureau