

REGULATION OF OPERATIONS OF SMALL UNMANNED AIRCRAFT

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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.

