The usefulness of the Environmental Guidelines for operation of Remotely Piloted Aircraft Systems in Antarctica - Insights from a survey

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in Antarctica - Insights from a survey**

**Information Paper submitted by Germany**

Summary

This paper provides a summarised overview of the results of a survey amongst the National Competent Authorities (NCA) initiated and carried out by Germany. The survey looked at the use of the *Environmental Guidelines for operation of Remotely Piloted Aircraft Systems (*RPAS[[1]](#footnote-1)*) in Antarctica (v 1.1)[[2]](#footnote-2)* adopted in 2018 (Resolution 4 (2018)) and at the general satisfaction of the NCA with them. The poll has verified that RPAS activities are part of almost all Antarctic programmes, comprising all fields of scientific research, tourism and recreational use. The majority of the NCA have already included the guidelines in their permitting processes. Most applications are for scientific purposes, followed by tourism and recreational use. Most NCA find the guidelines useful or adequate, with the strength of the guidelines being mostly regarded as well balanced. Twelve authorities have given extensive feedback on the flaws or possible improvements of the guidelines, most of the feedback includes different aspects of environmental/wildlife considerations, technical limitations and structural improvements.

Introduction

Because of the rapidly growing use of RPAS in the Antarctic Treaty Area and its only partly known impacts on wildlife, Environmental Guidelines for RPAS were developed during an intersessional ICG in 2017/2018, which was convened by Germany (see ATCM XL IP38 Use of UAVs in Antarctica - A competent authority’s perspective and lessons learned and ATCM XLI WP29 Report from the CEP Intersessional Contact Group to develop guidelines on the environmental aspects of the use of Unmanned Aerial Vehicles (UAVs) / Remotely Piloted Aircraft Systems (RPAS) in Antarctica). With Resolution 4 (2018) the Environmental Guidelines for operation of RPAS in Antarctica (v 1.1) (hereafter called ‘the Guidelines’) were finally adopted (see also Harris et al. (2019)).

Four years after the adoption of these Guidelines, Germany has raised the question whether the current state of knowledge and the experiences gathered so far with the Guidelines could already justify a guideline revision (see WP14). One step of this evaluation was to conduct a survey amongst the NCA by sending them an appropriate questionnaire and asking for responses. The aim of this paper is to present the summarised results of the responses Germany received from NCA.

Summarised results of the questionnaire evaluation

In December 2021, Germany posted a message about the intention of this request and the *Questionnaire regarding the use and benefit of the RPAS guidelines* (see Attachment) to the web-based Forum of Competent Authorities (at [www.ats.aq](http://www.ats.aq)) and additionally sent it to CEP representatives via e-mail. By February 2022, 19 NCA and IAATO had responded and sent back filled-in questionnaires.

***Part I – RPAS usage and application of RPAS guidelines in Antarctica***

*Results from the questions 1 – 4*

(1) Are drone operations in Antarctica part of the activities of members of your nation?

(2) Do you know the Environmental Guidelines for operation of Remotely Piloted Aircraft Systems (RPAS) in Antarctica?

(3) Have you/your authority worked with these guidelines?

(4) Are the guidelines a requirement of the permitting process or the Environmental Impact Assessment (EIA)?

All 19 NCA (plus IAATO) which gave feedback on the guidelines gave answers to questions 1-4 on the application of the Guidelines in their countries. Questions 1-4 and the results are shown in figure 1. The majority of NCA (89 %) stated that drones have been used during Antarctic activities, all NCA are aware of the Guidelines, and most of them (84 %) have applied the Guidelines before. In 15 countries, the guidelines are a requirement of the permitting process or the EIA (79 %).

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Figure 1: Answers to questions 1-4.

*Results from the questions 5 and 6*

(5) How many applications connected with the use of RPAS in Antarctica do you usually have each year in the fields of Journalism, Science, Tourism, Logistics and Others?

(6) What is the proportion of permit applications that include RPAS use in the total number of applications?

Regarding the fields of applications of RPAS, in most countries scientific usage is dominant or at least among the most common uses (see Figure 2), though the single highest number of applications (10) was reported for tourism. The mean number of applications per NCA and year ranged from 0.17 (other usages) to 2 (scientific usage). Others include communication purposes and closely managed recreational use. The proportion of permit application that included RPAS ranged from 0 to 80 %.

Figure 2: number of applications connected with RPAS in different fields per year (Question 5).

***Part II – Assessment of usefulness and balance of guidelines and proposed improvements***

*Results from the questions 7 and 8*

(7) Do you consider the current version of the guidelines (v1.1) as useful for your permitting process or EIA (Scale ranging from very useful to not useful)?

(8) Do you think the guidelines are … (Scale ranging from too strict to too weak)?

The assessment of usefulness of the Guidelines was answered by 17 of 19 NCA (plus IAATO). The majority of those find the guidelines in their current form useful (65 %), with 24 % of NCA additionally regarding them as adequate. One NCA each deemed the guidelines useful ‘with limitations’ and ‘not useful’. The balance of the current guidelines was assessed by 16 NCA, with most of them (87 %) finding them well balanced, and two regarding them as weak.

*Results from the questions 9 and 10*

(9) What/which aspects do you miss in the guidelines? (e.g. size/weight limits, reporting forms, minimum distances to wildlife)

(10) What should/could be improved?

A lot of feedback on flaws and possible improvements of the guidelines was given by 12 of 19 NCA (plus IAATO). A synthesis of the proposals will be summarized in the following.

*Environmental considerations*

The most requested environmentally related change was to include minimum distances to animals using specific values, as requested by two thirds of the authorities. Other proposals to better protect environmental values were restricted time periods for RPAS operations (particularly during breeding seasons and/or due to weather conditions like visibility, wind, temperature) and more details on interference with fauna and flora.

*Technical considerations*

The main concerns raised were technical limitations that should be defined within the Guidelines, such as a noise level threshold, flight speed regulations or weight, size and distance limitations (especially near wildlife). These limitations should also be defined in more detail giving clear numbers instead of broad statements. Additionally, technical requirements for RPAS used in Antarctica should be reinforced, recommending or demanding return-home functions, on-board GPS, communications with pilot, battery warning systems, electric powered engine, failsafe auto-landing systems and floatation systems when flying over water. Guidance should also be given on how to deal with out-of-sight-sight missions and on how to treat possible technical advancements in the future. Maximum distances between RPAS an its pilot (if not beyond the line of sight) should be prescribed.

*Certifications*

Several NCA proposed stronger demands of certificates for pilots and airworthiness of RPAS models. A uniform ecological training for pilots was also proposed.

*Coordination and Communication*

The most requested improvement for communication about RPAS activities were templates for reports of flight activities, especially and most importantly an accident report form. Several authorities also requested better regulation of the coordination of several airborne activities in one area, be it RPAS (with regards to accumulated environmental risk as well as security) or manned flight activities, namely restrictions or at least communication requirements in the vicinity of runways. Communications should be developed to faster and easier exchange experiences and results between users, as well as between authorities to unify permit processes and also exchange experiences.

*Others*

Other recommendations included considerations that should be regarded in the Guidelines, such as more details and special requirements for operating RPAS from ships or specific guidelines for operating RPAS in Important Bird Areas (IBAs) and Antarctic Specially Protected Areas (ASPAs). An incorporation of the COMNAP manual (forms, incident report) was also proposed. Several NCA required a better consideration of non-scientific users and purposes, like tourism and recreational use, a user-friendly summary was recommended, as well as the inclusion of more visuals. Specific measures for different purposes should be regarded.

*Note: If any Party is interested in the complete but anonymised responses, please contact the German CEP Contact Point.*

***Discussion and conclusion***

The application of RPAS in Antarctica is relevant for nearly all responding NCA. The existing Guidelines obviously have become an important part of the permitting process for the majority of NAC that responded. Less unexpected is the fact that the most common reason for using drones is scientific research. Surprisingly, however, RPAS use for tourist purposes comes in second place, although IAATO still has a ban on the recreational use of drones on their ships.

The most requested improvement was the inclusion of minimal distances of RPAS to wildlife. Other frequent suggestions involved inclusion of different specific technical limitations, like size and weight limits or noise thresholds. Many of these aspects have been part of the discussion during the process of developing the existing Guidelines from 2018, but were ultimately not included in these, for reasons of, amongst others, high complexity, structural or organisational concerns, or a lack of scientific basis. Other commonly requested changes concerning the structure and design of the guidelines have evolved over four years of application. Those suggestions involve a user-friendly summary, with higher focus on non-scientific applications for tourism and recreational use. They also involve the inclusion of report forms for activities and incidents and suggest a better link to other guidelines such as those by COMNAP. Some of the improvements proposed by the NAC like the advice to use RPAS with return-home functions or with on-board GPS are actually already part of the RPAS Guidelines (v 1.1) from 2018.

From the results described above the recommendation can be derived that the *Environmental Guidelines for operation of Remotely Piloted Air-craft Systems (RPAS) in Antarctica (v 1.1)* should be revised regarding their content as well as their structure in the near future (for specific proposals see WP14). Further, some NCA have expressed their wish to discuss the experiences with the usage of the RPAS guidelines within the web-based discussion forum for NCA at the ATS-website ([www.ats.aq](http://www.ats.aq)).

***Reference***

Harris, Colin M., Heike Herata, and Fritz Hertel. 2019. “Environmental Guidelines for Operation of Remotely Piloted Aircraft Systems (RPAS): Experience from Antarctica.” Biological Conservation 236: 521–31. <https://doi.org/10.1016/j.biocon.2019.05.019> available also at <http://www.iau.gub.uy/wp-content/uploads/2019/07/Environmental-guidelines-for-operation-of-Remotely-Piloted-Aircraft-Systems.pdf>

**Attachment**

**Questionnaire regarding the use and benefit of the RPAS guidelines[[3]](#footnote-3)**

In 2018, ATCM adopted Resolution 4 (2018) ‘Environmental guidelines for the operation of Remotely Piloted Aircraft Systems (RPAS) in Antarctica’. Further, ‘The Committee had noted the importance of reviewing and revising the guidelines, as appropriate, to reflect the current state of scientific knowledge of the environmental impacts and benefits of RPAS, and had encouraged support for further related research’ (see Final Report ATCM41).

This questionnaire ties in with the above-mentioned decisions of the Committee regarding the future **revision of the RPAS Guidelines**. For this task, we would like to get feedback from the potential users. Although the guidelines are also used by the actual operators of the drones (scientists, journalists, etc.), they are particularly important for those carrying out the environmental impact assessments for authorising the planned use of drones.

Please note that all information we receive will be evaluated anonymously, i.e. it will not be possible to draw conclusions about individual survey participants. Thank you!

1. Are drone operations in Antarctica part of the activities of members of your nation?

⃝ Yes

⃝ No

⃝ I do not know

1. Do you know the Environmental Guidelines for operation of Remotely Piloted Aircraft Systems (RPAS) in Antarctica?

⃝ Yes

⃝ No

1. Have you/your authority worked with these guidelines?

⃝ Yes

⃝ No

⃝ No, but we intend to do it in future

⃝ I do not know

1. Are the guidelines a requirement of the permitting process or the Environmental Impact Assessment (EIA)?

⃝ Yes

⃝ No

1. How many applications connected with the use of RPAS in Antarctica do you usually have each year? Please fill the following table:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Journalism | Science | Tourism | Logistics | Other |
| Applications |  |  |  |  |  |

*(If precise numbers are not available, please estimate)*

1. What is the proportion of permit applications that include RPAS use in the total number of applications?

…..... %

*(If precise numbers are not available, please estimate)*

1. Do you consider the current version of the guidelines (v1.1) as useful for your permitting process or EIA?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Very useful | Useful | Adequate | With limitations | Not useful |
|  |  |  |  |  |

1. Do you think the guidelines are …

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| too strict | strict | well balanced | weak | too weak |
|  |  |  |  |  |

1. What/which aspects do you miss in the guidelines? (e.g. size/weight limits, reporting forms, minimum distances to wildlife)

………………………………………………………………………………………………………………………………………………

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1. What should/could be improved?

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1. A Remotely Piloted Aircraft System (RPAS) is defined by the International Civil Aviation Authority (ICAO) (2015) as “A remotely piloted aircraft, its associated remote pilot station(s), the required command and control links and any other components as specified in the type design”. A Remotely Piloted Aircraft (RPA) is “An unmanned aircraft which is piloted from a remote pilot station”. RPAS are one class of Unmanned Aerial System (UAS), and they are often referred to as Unmanned Aerial Vehicles (UAVs), Unmanned Aircraft Systems (UAS) or ‘drones’. In this context RPAS is used for all types of remotely piloted drone systems, the term which has also been adopted by COMNAP, SCAR and a number of national authorities, and RPA is used to refer specifically to the aircraft itself. [↑](#footnote-ref-1)
2. https://documents.ats.aq/recatt/att645\_e.pdf [↑](#footnote-ref-2)
3. <http://www.iau.gub.uy/wp-content/uploads/2019/07/Environmental-guidelines-for-operation-of-Remotely-Piloted-Aircraft-Systems.pdf> [↑](#footnote-ref-3)