Uncrewed Aircraft Systems Usage at Staffed Sites in Greenland

Background

This document is intended to outline parameters for operating uncrewed aircraft systems (UAS) near staffed NSF science sites, based on the environment and activity. For the purposes of this document, UAS include both powered aircraft ("drones") as well as tethered balloons, and program guidance applies equally to these systems. Additional information and notes on best practices may be found here: https://eu-interact.org/using-drones/

Regulatory guidance on drones

Science teams are independently responsible for researching, understanding and complying with permitting requirements and laws. Information is provided here to facilitate initial planning; all science teams must ensure legal compliance as part of their fieldwork preparations. Drones are controlled based on the rules in the Aviation Act and Provisions on Aviation, BL 9-4. The Danish Civil Aviation and Railway Authority maintains reference information at the following link: General rules for drone flying

Regulations for flying drones in Greenland vary based upon location. There are specific requirements for drones or instrumentation that weigh over 7 kg, or drones used for commercial purposes. Permits are required through Danish aviation authorities and a dispensation may be required.

This overview assumes drones in use are "private" and not used for commercial purposes. Drones weighing over 7 kg are not permitted for recreational or operational use.

General requirements excerpted from Danish Air Navigation Act:

- The distance to the runway/runways of a public aerodrome must be at least 5 km*
- The distance to the runway/runways of a military airbase must be at least 8 km
- The distance to built-up areas and major public roads must be at least 150 m
- Flight level must not exceed 120 m above the ground
- Densely built-up areas and areas in which a large number of people are gathered in the open air must not be overflown

The drone must always remain within sight of the operator.

Summit Station

This document outlines requirements for flights within the Summit Station area allotment boundary (defined by a circle of radius 7 km centered at the GISP-2 borehole).

Summit Station is a populated area and the risk to others must be balanced against needs for local flying, including testing science equipment, station operational photography, and crewed aircraft flight operations. The following risk mitigations will be implemented for all flights:

- Flight timing and location will be planned with the Site Supervisor and selected to minimize risk of hazards to humans and infrastructure.
- Flight timing and location must be announced at morning meeting and again via radio immediately prior to flights.
- Pilots are responsible for maintaining a minimum horizontal separation of 50 meters from all structures and humans not associated with UAS flight operations.
- Pilots are responsible for landing aircraft immediately if humans approach.

Science project flights:

- Planned flying activities will be outlined in the season plan, reviewed during risk assessment and upon arrival at Summit Station.
- Crewed flight operations take precedence over UAS operations.
- Science teams must communicate planned flight activities in advance during morning meeting, preferably a day or two ahead of proposed operations, to allow identification of any potential conflicts with crewed aircraft or other activities. For each flight, one pilot with responsibility for the activity must be identified by the science team to the Site Supervisor.
- Science teams must notify the Site Supervisor at the start and end of flight activities:
    - Notification may be made via telephone or radio but must be acknowledged prior to starting flight activity and upon completion of flight activity.
    - May cover a period of operations rather than individual flights.
    - The period of operations ends if the device is placed into storage for a meal, change in overall work or end of day.
- On flight days, the UAS must be grounded as follows:
    - UAS must be grounded no less than 1 hour before the most-current crewed aircraft arrival time provided by Site Supervisor. The pilot must initiate landing activities in advance of this grounding deadline based on expected retrieval duration, and with sufficient margin to ensure compliance.
    - UAS must remain grounded while the crewed aircraft is on deck at Summit Station.
    - UAS must remain grounded until 15 minutes after departure of crewed aircraft.
    - Grounding means landing the UAS at the surface, and either securely anchoring the UAS or bringing it inside a structure.
    - The pilot must immediately communicate with the Site Supervisor if the UAS is not grounded during the scheduled grounding period. For example, if the retrieval and anchoring of a tethered balloon has not been completed 1 hour prior to aircraft arrival.
- In the event of an extended aircraft stay on station, flying activity will be evaluated on a case-by-case basis with the Site Supervisor, flight crew, and UAS pilot.

Operational tasking / staff flights:

- All notification and flight day requirements outlined above apply to operational tasking flights, with one exception noted below:
    - Staff-operated UAS may operate nearer to structures as needed to accomplish tasking.
- Drones weighing more than 7 kg will not be utilized for operational tasking to avoid permitting requirements.

Recreational flights:

- All notification and flight day requirements outlined above apply to recreational flights.
- Drones weighing more than 7 kg will not be utilized for recreation to avoid permitting requirements.
- Recreational flights will not be permitted during standard station work hours.

Restricted Areas, Weather Conditions and Distance of Flights:

- Flying is not permitted over the Clean Air Zone (CAZ) to avoid risk of incident and recovery activities, unless approved through formal CAZ access processes outlined in the Clean Air Management Plan.
- Summit Station Travel Policies will be observed, and operational/recreational drone flights will not be permitted outside of the Summit Station area allotment boundaries.
- In the event of an incident involving a UAS, the Site Supervisor will be notified as soon as it is

safe to do so. All recovery travel must be performed in accordance with the Summit Station Travel Policy, including development of a travel plan with the Site Supervisor.

- The use of vehicles for drone recovery must be performed in accordance with the Clean Air Management Policy, including delaying recovery activities if north/low wind conditions are present.
- UAS flights will be performed during Condition 3 weather only, with a steady to improving forecast
- These guidelines apply to all UAS activities performed by participants based at Summit Station.

Raven Camp

Planned science flying activities will be outlined in the season plan, reviewed during risk assessment and upon arrival at Raven Camp in the event of a Raven-based science team.

Operational or recreational flights will be planned to deconflict with any ANG or other aircraft activity and flights are only permitted in the direct camp vicinity.

Kangerlussuaq

Due to proximity of airport and local community, no UAS flights in town are permitted. See the general requirements section and consult with the local Airport Authority for planned flights.

Pituffik Space Base

Pituffik Space Base is an active military base. Pituffik Space Base is developing a policy that will include an activity request form. Until finalized, the following guidance applies:

Approval for drone flights must come from the Operations Support Flight Commander.

- Current contacts:
  - Capt. David Albertson: david.albertson@us.af.mil
  - TSgt Alexander Baron: alexander.baron@spaceforce.mil

A request must be submitted at least 24 hours in advance, to include:

- Name and affiliation of requestor / point of contact
- Operating time
- Operating location

Immediately prior to flight:

- Contact the Airfield Tower at ext 2670 from base phones. If the Tower is closed or does not answer, contact Capt Albertson at ext 2750 or Tetra 88-2750.

Immediately after flight:

- Contact the Tower or Capt Albertson to close out the activity.

In the event of a drone mishap during flight:

- Contact Capt Albertson and the Alarm Center x 2860.

This guidance includes drones less than 7 kg in weight. Anything larger requires additional permission.

Certain areas of base may be entirely off-limits. Other areas may be schedule dependent. Guidance is subject to change at any time based on Pituffik Space Base security requirements.

Permissions are subject to change based on regulatory guidance or real-time circumstances.