

Unmanned Aerial Systems (UAS) Operations from UNOLS Ships: Operator's Handbook

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To develop UAS Policy and guidance documents for Shipboard Operations on UNOLS ships



The handbook is designed to provide detailed guidance on how to operate UAS from UNOLS research vessel

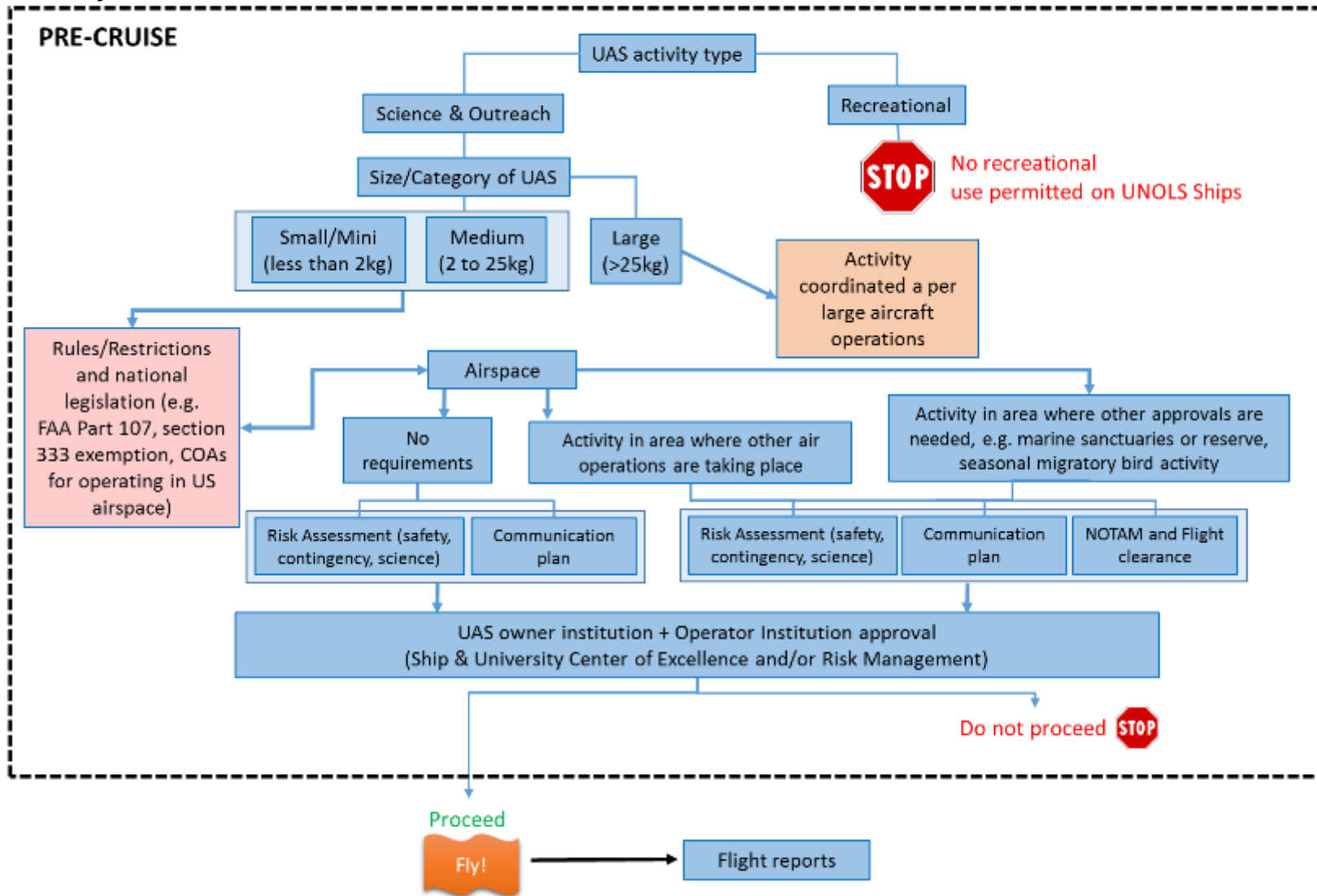
UAS Policy (endorsed by the UNOLS Council in summer 2016):

With the recent publication of the FAA small UAS rule, a policy for UNOLS ships has become necessary. Effective immediately, operation of Unmanned Aircraft Systems (UAS), or drones, from or over UNOLS ships may not take place without demonstrated compliance with national or international regulations (ICSA, FAA) and specific approval of the ship's captain or designee, as a minimum. This applies to crew, techs and members of the science party, and refers to all operations, whether recreational, educational, or professional. Obtaining national approvals, such as FAA's Sec 333 exemption or Certificate of Authority or Waiver (COA), as well as pilot qualifications, are not a guarantee the operations will be approved by the ship's captain. Recreational or hobbyist freedom of use over land is not available at sea, so the importance of contacting the ship's operator ahead of time is critical. Detailed policies and processes are in development by SCOAR to provide guidance and training.

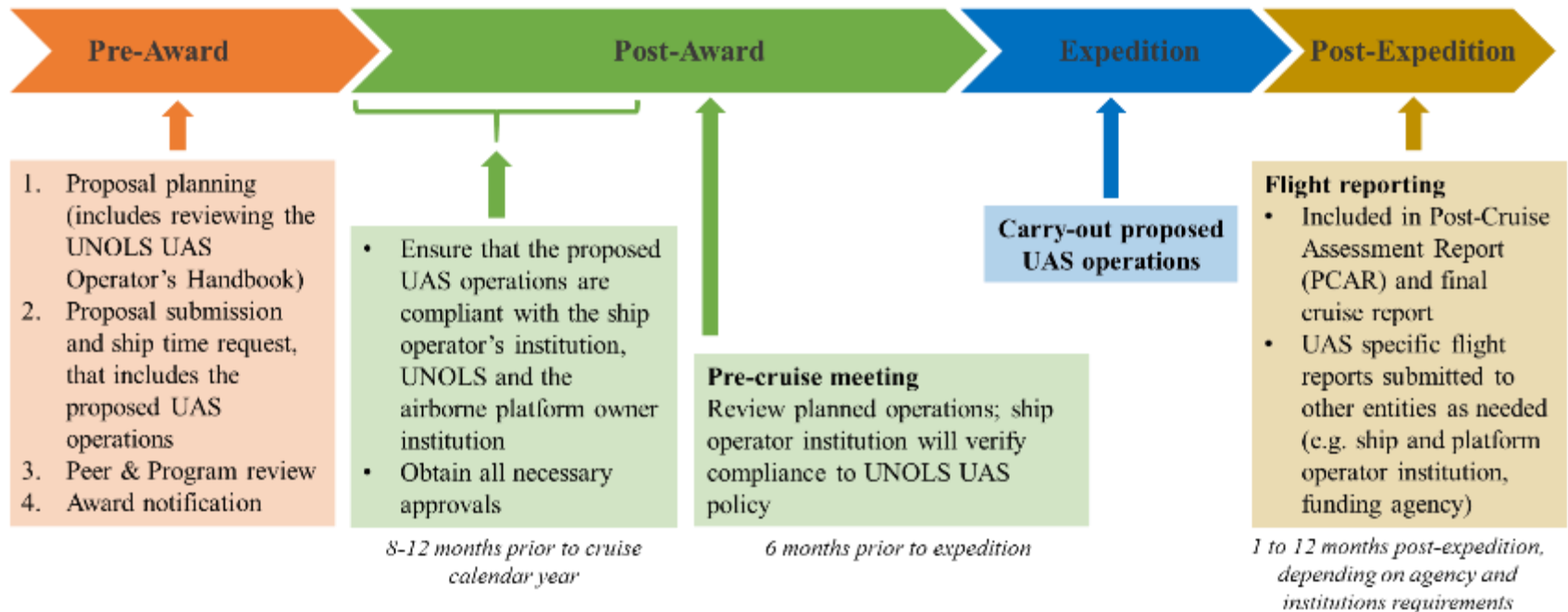
Status: Final draft sent to Dennis Nixon this week for final review before sending it to the council for endorsement

- General information (regulatory, size, classification etc)
- Flowchart for decision-making
- Timeline
- Requirements broken down into three sections:
 - Planning and preparation
 - Shipboard procedures
 - Post-cruise actions
- Extensive Appendices, covering risk assessment and management, communication plans, NOTAMs, report and record-keeping, environmental review, operators and center of excellence point of contacts, etc.

Used by science party and operator institution as a tool to assist them with safe UAS operations in a range of situations. It recommends appropriate steps to take in the pre-planning stages of the activity.



Timeline – When should a PI start planning UAS operations?



1. All UAS deployment are to be conducted for support of science, including science support, ship logistics and operations, outreach/documentation of research, and for use in emergency and search and rescue situations. Recreational use is not permitted on UNOLS research vessels.
2. All proposed UAS operation conducted from a UNOLS research vessel must be approved by the oversight entity of the ship and UAS operator institution. A number of institutions now have a flight request system in place to check FAA compliance of the proposed effort. The research vessel must have an approved shipboard UAS operations policy tailored to the specific ship.
3. All UAS operational plans must be covered in pre-cruise planning meetings with the research vessel crew.
4. Liability insurance coverage must be compliant with the requirements imposed by the ship operator institution and the institution that owns the UAS or RPA.
5. Recognizing that there are many regions of the world where no manned air operations take place and that there are areas that require detailed coordination with range operators (restricted and warning airspace along the coast of continental United States). In these areas, advanced communication of planned UAS operations, emplacement of UAS restrictions (height and radius around manned air operations locations and facilities) or emplacement of technologies such as "geo-fences" are required.
6. If operations are conducted in waters or airspace where no local regulations are in place, it is recommended to follow the general guidance of the Convention on International Civil Aviation Organization? (ICAO).

7. Where practical, all major components of any UAS must carry identification marks, including any national registration and identification information, in order to identify the pilot and operator for record keeping or in the event of an accident, incident or near-miss. Any such marks, especially on medium and large RPA should be placed on the deployed aircraft in a manner that can be clearly visible during flight. Brightly colored RPAs might be appropriate for over the water use, for retrieval/recovery purposes.
8. Ship operator institutions are to take a common approach to safety risk assessment based on a recognized and commonly accepted air operations framework so that RPA operations can be carried out in as safe a manner as manned aircraft operations and not present a hazard to persons, property or the ocean environment that is any greater than that attributable to the operation of manned aircraft performing the same or similar activity.
9. Each RPA pilot must produce proof of appropriate training and certification, and the ship operator institution must ensure that each RPA pilot is appropriately trained in accordance with national regulations and in a manner that is consistent with, for example, the provisions of Annex 1 to the Convention on International Civil Aviation (ICAO) Personnel Licensing, and provides proof of proficiency of training or competency for the specific category and type of RPA to be flown. If the pilot is flying his/her own manufactured RPA, specific airworthiness certification must be required.
10. Ensure that proposed UAS or RPA operations is in compliance with Department of Defense (DoD) requirements if the project or airborne platform is funded by DoD.

1. A pre-flight plan must be developed prior to the start of a field experiment using UAS. A standard ship-specific checklist must be used.
2. Risk assessment must be part of a pre-flight check-list to be completed prior to UAS flight operations. All UAS deployments conducted from research vessels must involve appropriate notifications (see Appendix 2). In areas with manned air operations, use of a communications plan and the NOTAM (or similar) system may be required.
3. Prior to UAS launch, a safety brief must be held for all personnel involved with the operation,.
4. All UAS operations conducted from research vessels must contain provisions for safe and appropriate retrieval of waste in the event the UAS suffers an accident as part of its operations.
5. Any UAS accident, incident or near miss must be reported immediately in accordance with Appendix 6.

1. It is strongly recommended that as enabling technology develops, on attributes such as search and avoid capabilities or perception and avoidance systems, that ship and UAS operators consider routine integration of such technologies, after maturation, in UAS deployments.
2. All UNOLS affiliated institutions must routinely share operational and certification information and any documentation developed, in support of the sharing of best practices and to facilitate the establishment of national accreditation and operational programs.
3. A flight record for each UAS flight should be submitted to the operator institution and UNOLS SCOAR, in accordance with Appendix 5.

Questions?