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OPENING THE ARCTIC AIRSPACE FOR UNMANNED AIRCRAFT

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The Arctic represents one of the earth's harshest climates and a vast unexplored region, many of its areas are accessible only by high risk aviation missions or by marine vessel. The Arctic Council members desire to support UAS operations over the high seas in an effort to further scientific and search and rescue (SAR) missions across international flight information region (FIR) boundaries while remaining outside of sovereign airspace.

The Arctic Council's Arctic Monitoring and Assessment Programme (AMAP) established an Unmanned Aircraft Systems Experts Group (UASEG) in 2009 to identify how UAS can fulfill unmet scientific needs in the Arctic regions. Since 1999 many scientific UAS research missions within an individual country's Flight Information Region (FIR) utilizing UAS has been conducted, though the flights have been limited in number and in the scope of the area of operations. The potential for expansion of these scientific flights is limited due to the lack of:

1) Knowledge of the capability of the technology within the scientific community
2) The ability of UAS to comply with established rules of the air regulations.
3) Consistent application or implementation of operational approvals.

Ongoing scientific questions about the changing Arctic are creating a demand for access across FIR's in order to effectively monitor and assess these changes in a manner that reduces the risk to people involved in the research. The ultimate goal is to have the ability to conduct Pan-Arctic, cross-FIR scientific observations from UAS on a routine basis.

Cross-FIR operations are not routine and are challenging to conduct because of the lack of understanding of how such flights can be accomplished. To achieve Pan-Arctic scientific observing capability with UAS, the ability to routinely fly across FIR boundaries must exist.

The first step towards a Pan-Arctic FIR agreement for UAS is in establishing an understanding between the Arctic States administrating the airspace by defining the minimum safety and operational requirements for scientific UAS operations. This step would be coordinated via the Civil Aviation Authority (CAA) and Air Navigation Service Provider (ANSP) of each Arctic Council member state.

In order to be considered for cross-polar UAS scientific and SAR missions, the operator must comply with the recommended protocols presented. These protocols are an effort to encourage UAS operations in accordance with national regulations and in a manner that meets the applicable International Civil Aviation Organization (ICAO) provisions to ensure the safest possible outcome of each mission.

All cross-polar UAS operations shall be approved by each State involved, the State of the operator, the State of Registry and those States whose sovereign airspace is to be overflown. Prior to conducting operations in high seas airspace, the operator must coordinate the planned activities with the air traffic services (ATS) provider(s) responsible for each of the FIR(s) to be affected (See figure 1).

The UASEG has formulated a list of UAS beyond Visual Line of Sight (VLOS) recommended practices and improvements that should assist the ANSP's in mitigating risks to other aircraft operating in the Arctic, and prepared a set of guidelines to be published by AMAP.

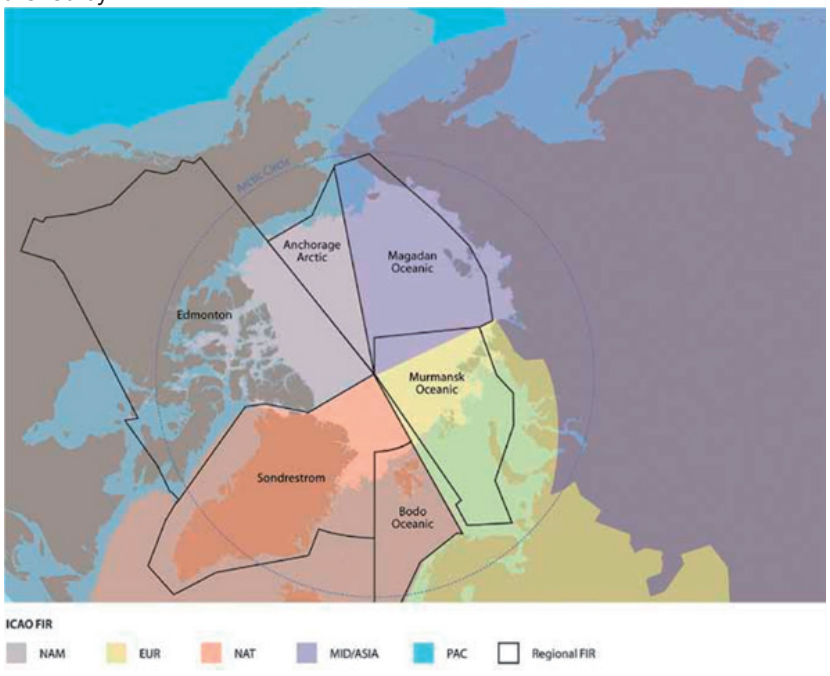

Figure 1. Arctic Flight Information Regions (FIRs)