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SAXAVORD SPACE PORT ACP-2017-79 - STAGE 2 SUBMISSION

SAXAVORD UK SPACE PORT

V1.0 dated 10 Jun 22

Introduction

- **ACP Sponsor Nomenclature**. For the avoidance of doubt, Shetland Spacecentre Limited, trading as SaxaVord Space Port Limited (hereinafter referred to as "SaxaVord"), is the Sponsor of ACP-2017-79.
- **Purpose**. This PowerPoint presentation must be read in conjunction with the accompanying ACP-2017-79 Stage 2 Submission document; together, these artefacts demonstrate SaxaVord's adherence to the CAP1616 Stage 2 process requirements and guidance, pertaining to the ACP-2017-79 airspace design option.

Step 2A - Options Development

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ACP-2017-79 Design Principles (DPs)

- DP1. The safety of other airspace users and the public is the paramount design principle to be used in the [ACP].
- DP2. The environmental and noise effects of rocket launch should be minimised by the design of the airspace change.
- DP3. The airspace volume should be as small as possible to minimize the impact on and ensure the safety of other airspace users.
- DP4. The duration of the airspace activation should be the minimum required to minimize the impact on and ensure the safety of other airspace users. The possible impact of concurrent operations of other airspace should be considered.
- DP5. Airspace notification should be timely and accurate with an established method for rapid notification.
- DP6. A process to allow some special airspace users to enter the airspace safely and halt launch operations should be established.
- DP7. Other International airspace agencies should be included in the airspace design process.
- DP8. Airspace design should meet duties and requirements of other public agencies placed upon [SaxaVord].
- DP9. Letters of Agreement and Memoranda of Understanding will be developed, if required, between relevant parties.
- DP10. The airspace change will take account of ongoing and continuing airspace management and policies.

Step 2A - Sponsor Develops Airspace Change Options

Design option(s) must accommodate multiple launch scenarios, comprising orbital and sub-orbital launches of differing types of launch vehicles with differing operating parameters. Moreover, design option(s) must adhere to the established Stage 1 DPs (outlined in the previous slide).

In terms of airspace volume, orbital launches and sub-orbital launches each have their own unique requirements; as such, after safety (DP1) and environmental (DP2) considerations, the volume design must allow for the various launch profiles to occur throughout the ongoing operation. A modular airspace volume designed to accommodate both orbital and sub-orbital launches is therefore targeted; consequently, the airspace volume will be as small as possible for each launch, thereby minimising impact on other airspace users.

The geographic location of the proposed launch site and the use of vertical launch rockets, in conjunction with the expected trajectories of the rockets, will help to minimise the size of the overland airspace in the immediate vicinity of the launch site. Moreover, the proposed design option ensures the avoidance of overflight of populations and/or adjacent third-party infrastructure.

In designing airspace to support vertical launch operations from SaxaVord Space Port, the scope for proffering multiple realistic design options is significantly limited. Thus, to satisfy all DPs to the greatest possible extent, the only airspace design option is that which is expanded upon in Step 2B

Step 2a - Sponsor Tests Options With Relevant Stakeholders

SaxaVord engaged relevant stakeholders to explore and develop the design option and corresponding DPs.

Responses to engagement questionnaires were received and incorporated into a further iteration of the DPs; a subsequent engagement was undertaken. All responses were positive and there was no disagreement with the proffered DPs. Thus, at the corresponding Design Principle Review, no changes were made and the DPs were submitted to the CAA's ACP portal.

As agreed with the CAA on 31 Jan 22, ACP-2017-79 would be informed by the ongoing activities associated with the SaxaVord Temporary ACP application (ACP-2021-090). This interdependency is also specified in the agreed Statement of Need for ACP-2021-090.

The stakeholder engagement associated with ACP-2021-090 has reinforced the ACP-2017-79 DPs.

Step 2B - Option Appraisal

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Step 2B - Option Appraisal

Design option(s) must incorporate multiple launch scenarios, incorporating orbital and sub-orbital launches of differing types of launch vehicles with differing operating parameters. Moreover, design option(s) must adhere to established DPs (outlined earlier).

Orbital launch profiles (and, therefore, airspace orientation) are driven by low-Earth orbit requirements. Orbital launches will be to sun-synchronous and high-inclination orbits in the low-Earth orbit altitude range. Exact ground tracks will vary with targeted orbit(s) and launch vehicle type(s).

Driven by safety requirements, sub-orbital launch profiles are not to overfly populations and/or third-party infrastructure.

Thus, to satisfy all DPs to the greatest possible extent, the northerly (330°-030°) profile is the only option to support vertical launch operations from SaxaVord Space Port.

Step 2B - Initial Safety Assessment

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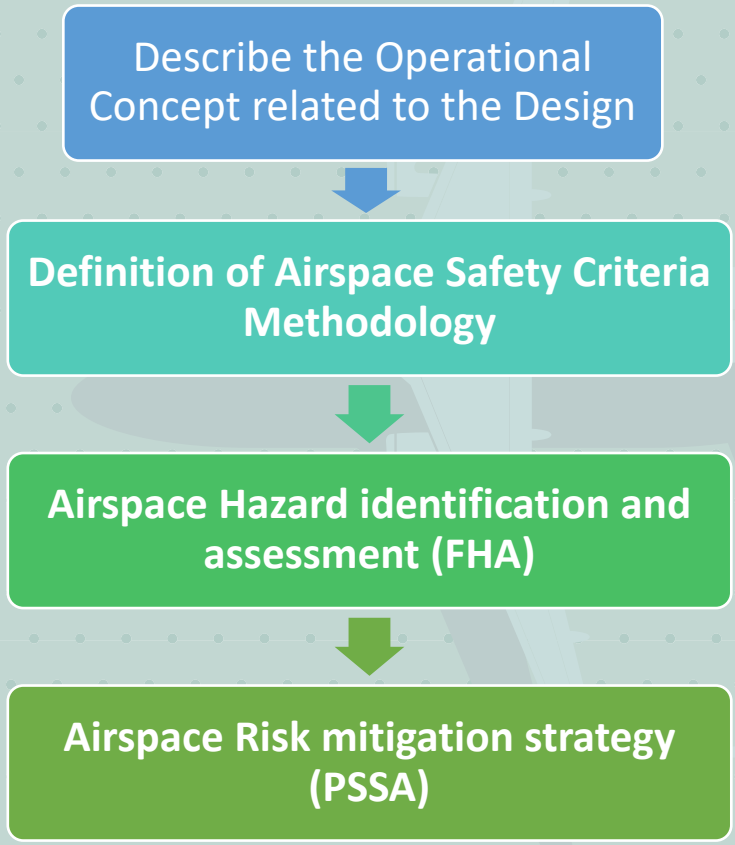
Safety Scope and Objectives

- Aligned with UK Space Industry Regulations.
- Identify events associated with the activation/deactivation of the Airspace that could lead to Operational Hazards.
- Ascertain if the area bounded by the Airspace is adequate.
- Qualitatively assess the severity and likelihood of identified hazards.
- Assign an overall risk rating for each hazard.
- Where necessary, identify possible mitigations to reduce the risk rating to ALARP.



Functional Hazard Assessment

- Phased-scenario approach.
  - **Pre-launch Phase.** Definition: up to 'Launch State' approx. 10 min prior to launch for final 'Go'.
  - **Launch Phase**. Definition: final launch "Go" is issued.
  - **Post-launch Phase**. Definition: the point at which the launch is complete (after nominal or sub-nominal).
- [redacted]. All identified hazards assessed as "Acceptable" through either known internal barriers and/or external mitigations.
- Initial safety requirements established for airspace operation.

[redacted]

[redacted]

1. [redacted]
2. [redacted]
3. [redacted]
4. [redacted]
5. [redacted]

[redacted]

6. [redacted]
7. [redacted]
8. [redacted]
9. [redacted]
10. [redacted]
11. [redacted]

Proposed Airspace Design Option

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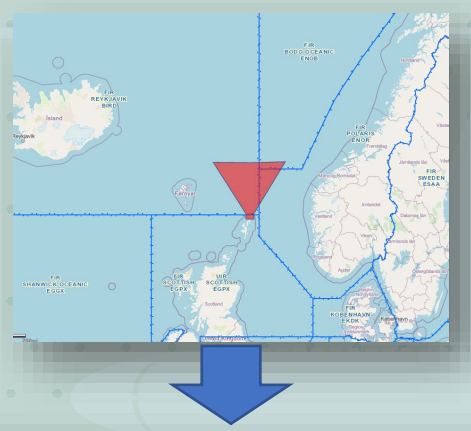
Proposed Airspace Design Option

- Current coordinates of the area are:

Latitude	Longitude
60 46 12 N	1 06 00 W
60 46 12 N	0 25 12 W
61 00 00 N	0 25 12 W
61 00 00 N	1 06 00 W
63 17 57 N	2 34 29 E
63 17 57 N	4 5 41 W



- This proposed design covers both nominal and sub-nominal events for launch vehicle trajectories.
- Airspace may be activated for a specified and notified launch window, either as the “Box Area” only for Orbital Launches or the “Box and Wedge Area” combined for Sub-orbital launches.
- Further danger area for nominal return of rocket fairings and 1st stage will be notified separately via NOTAM with a corresponding time window.

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