SP-1 Airspace Change Manager
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ACP-2021-12 – Airspace Design Principles

1 Introduction

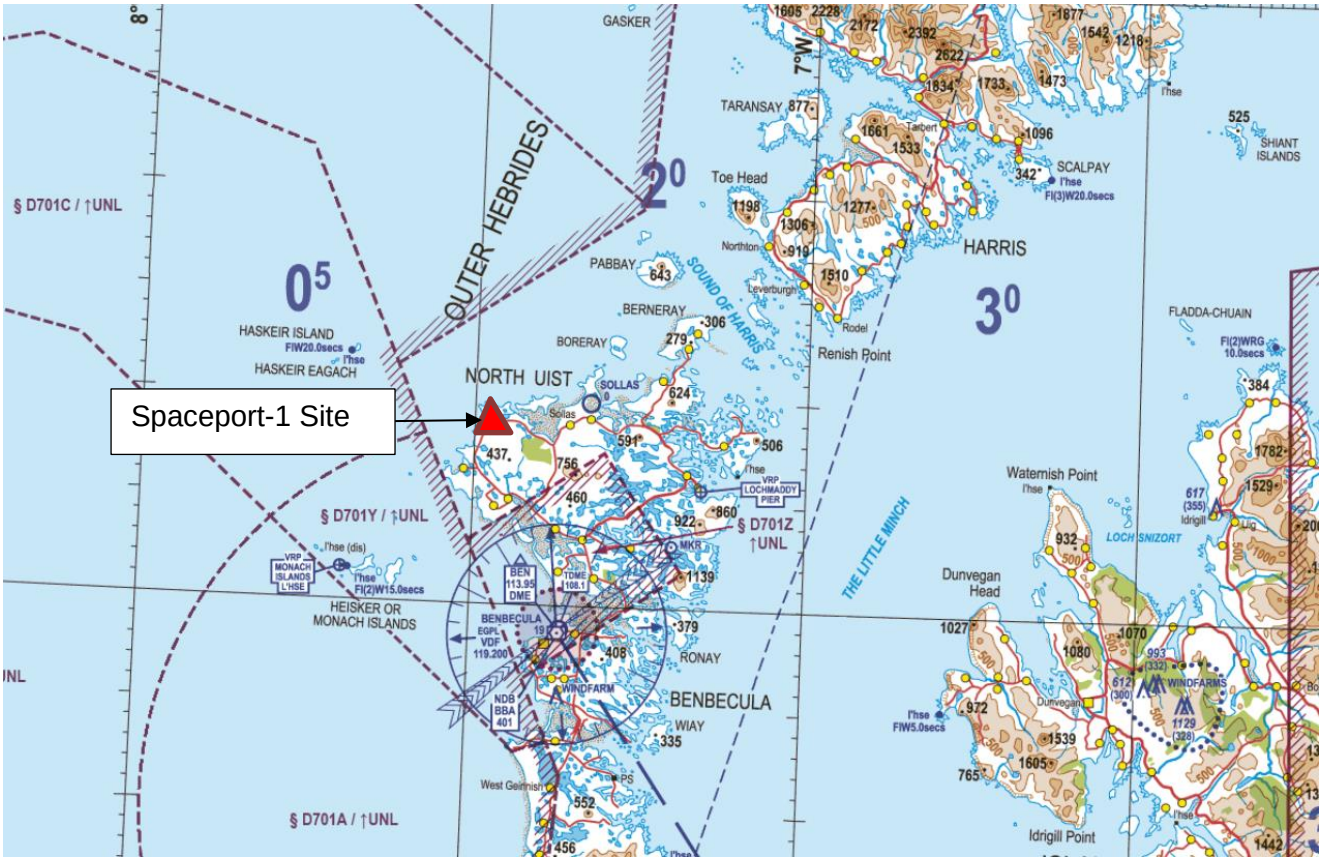
The Spaceport 1 (SP-1) consortium led by the local council, Comhairle nan Eilean Siar, comprising Highlands & Islands Enterprises (HIE), private investors and QinetiQ, are developing a vertical launch spaceport located at Scolpaig, North Uist. In addition to the requirement to gain planning consent and conducting associated Environmental Impact Assessments (EIA), there is a regulatory requirement to ensure any activity that may be hazardous to other airspace users is segregated accordingly. Such segregation is normally achieved through the establishment of airspace restrictions in the form of a notified Danger Area. Danger Areas are then activated when required though existing airspace Notice to Airman (NOTAM) processes and procedures.

To enable SP-1 to operate, the method of establishing segregated airspace around the launch site is enabled through the Civil Aviation Authority (CAA) Airspace Change Proposal (ACP) process as defined in Civil Aviation Publication (CAP) 1616. QinetiQ Ltd is acting as the airspace sponsor for the ACP in support of SP-1. CAP1616 process comprises 7 stages each of which are considered by the CAA separately and sequentially. Each stage informs the next and is not solution driven. In this particular instance, the requirement to launch sub-orbital and orbital small satellite rockets from Scolpaig has been presented to the CAA at Step 1A of Stage 1 of the ACP process and the CAA has agreed that an airspace change is an appropriate means by which to achieve the SP-1 requirement.

Details of this step can be found on the CAA's online airspace change portal at:
https://airspacechange.caa.co.uk/search?Page=1&SponsorOrganisation=QinetiQ%20Ltd

This ACP is just one part of the full regulatory process to enable SP-1 to operate. Other processes underway include planning consent, spaceport licence, launch operator licence and Range control licence. By necessity, several of these processes overlap in particular where stakeholder engagement and consultation is necessary. It should be noted that this part of the ACP process (Stage 1 Step 1B) is 'engagement' to inform the airspace design; further engagement on the actual airspace design occurs during Stage 2 (later this year) with formal consultation on the establishment of the airspace occurring in Stage 3. This is likely to occur early 2022; addressees will be notified accordingly.

2 Stage 1 Step 1B – Design Principles



QinetiQ will follow the next steps of CAP1616 to develop options which will help to deliver the most appropriate solution and address the requirements for a spaceport. Under the ACP process it is necessary to develop a set of design principles that provide a framework that is used in drawing up the airspace design. In developing the design principles the sponsor is required to engage with affected local aviation stakeholders, including airspace users; Air Navigation Service Providers (ANSPs); airports; relevant members of the National Air Traffic Management Advisory Committee (NATMAC); relevant aviation and non-aviation national organisations including those which represent areas likely to be affected by potential impacts; and, elected representatives of environmental interest groups likely to be affected by potential impacts. Following this engagement process ensures a fair and transparent flow of information between the change sponsor and any affected stakeholders. QinetiQ is keen to engage with stakeholders and is asking for your feedback when considering the airspace design principles. QinetiQ has compiled a set of draft design principles detailed at Table 1. You as a stakeholder are invited to comment on these principles while also contemplating any omissions that you believe should be accounted for. You may wish to ask for more information on these principles. Any additional detail and reasoning behind your feedback is encouraged. For this stage of the ACP 'engagement' process, we are only asking for your view on the airspace design principles; further engagement and consultation takes place in later stages of the process as described above.

Table 1: List of Draft Design Principles for Consideration

DP Ref	Category	Design Principle
DP1	Safety	The safety of all airspace users is the paramount factor in the airspace design
DP2	Safety	The airspace design will be of the smallest volume to safely segregate Spaceport rocket launches from other airspace users thereby minimising the impact on other airspace users
DP3	Operational	Minimise the impact (on other aviation stakeholders) of activating specific EG D701 Danger Areas in support of SP-1 operations
DP4	Operational	Use Flexible Use of Airspace (FUA) principles by integrating the airspace design into the extant Airspace Management (ASM) procedures operated within the EG D701 complex
DP5	Operational	Integrating/deconflicting SP-1 activity safely with MOD activity in EG D701 is a vital element of the operational use of the airspace design
DP6	Operational	The airspace design shall take into account Free Route Airspace (FRA) and Flight Planning Buffer Zones (FBZs) remaining cognisant of CAA Buffer Policy
DP7	Environmental	The airspace design and any associated activation of EG D701, need to consider the environmental impact of aircraft being re-routed around the airspace in addition to the noise, emissions and light pollution in the local area.
DP8	Regulatory	The airspace design will need to consider any emerging regulations pertaining to spaceports and Ranges under the spaceport act 2018
DP9	Operational	Rocket stage drop zones may be required outside EG D701 and will need to be considered

2.1 Design Principles Expanded

DP1	Safety	The safety of all airspace users is the paramount factor in the airspace design
Safety is the single most important factor and DP1 establishes the need to design airspace that provides adequate protection from any hazards associated with rocket launch from SP-1 to other airspace users. Note: safety of third parties on the ground or seaspace is detailed in separate but parallel work packages associated with the planning consent regulations.		

DP2	Safety	The airspace design will be of the smallest volume to safely segregate Spaceport rocket launches from other airspace users thereby minimising the impact on other airspace users
In ensuring safety of other airspace users the airspace design should consider the potential failure of the spacecraft both at the launch site, immediately after launch and when in flight. The airspace design must be of sufficient volume to contain all credible risks associated with rocket malfunction for both orbital and sub-orbital sounding rockets. The former will have trajectories predominantly to the North of the launch site and despite the EG D701 complex containing a significant portion of the hazard, the airspace design may need to consider airspace outside the EG D701 boundaries. This may, in the interests of minimising the volume of airspace required, call for a bespoke modular airspace design within EG D701 complex as well as beyond.		

DP3	Operational	Minimise the impact (on other aviation stakeholders) of activating specific EG D701 Danger Areas in support of SP-1 operations
When considering the impact on other airspace users the new airspace should not be considered in isolation but must also take into account the consequential impact of activating numerous EG D701 areas for SP-1 operations (if this is deemed appropriate) at times when the Danger Areas may not normally be activated. This design principle includes consideration of which EG D701 areas need to be activated and their impact on other stakeholders in particular where these necessitate the closure of Oceanic Entry Points (OEPs) for the North Atlantic (NAT) tracks. It may prove beneficial to utilise EG D701 for sub-orbital sounding rocket activities where these can be contained mainly within the EG D701 complex. This DP may not be relevant if a bespoke modular design is preferred for orbital launches.		

DP4	Operational	Use Flexible Use of Airspace (FUA) principles by integrating the airspace design into the extant Airspace Management (ASM) procedures operated within the EG D701 complex
This design principle should include integration of the new airspace into the Airspace Management (ASM) processes of the existing EG D701 complex thereby minimising the need for new multifaceted standalone procedures and exploiting current Standard Operating Procedures (SOPs). This will enable timely notification of operations and swift cancellation of NOTAMs thereby freeing up airspace efficiently. Furthermore, expanding		

extant EG D701 procedures to include the new SP-1 airspace (both around the launch site, beyond EG D701 boundary or, for a bespoke solution), will enable safe access for other airspace users when deemed necessary, in particular emergency services.

DP5	Operational	Integrating/deconflicting SP-1 activity safely with MOD activity in EG D701 is a vital element of the operational use of the airspace design
It is recognised that use of the EG D701 areas will be subject to MOD activities and priorities therefore an important design principle will be the operational integration of SP-1 activities in and around MOD use. By managing both programmes, QinetiQ expect to be able to facilitate the most efficient use of airspace especially where it is proven safe to conduct simultaneous operations.		

DP6	Operational	The airspace design shall take into account Free Route Airspace (FRA) and Flight Planning Buffer Zones (FBZs) remaining cognisant of CAA Buffer Policy
It is recognised that any new Danger Area airspace will have to comply with the CAA Buffer policy and ANSPs may be required to apply FBZs. The design principles will have to take into consideration both these requirements. Furthermore, the advent of FRA in the Scottish Flight Information Region (FIR) will need to be considered.		

DP7	Environmental	The airspace design and any associated activation of EG D701, need to consider the environmental impact of aircraft being re-routed around the airspace in addition to considering the noise, emissions and light pollution in the local area.
It is likely that the new airspace around the launch site and beyond the boundaries of EG D701 will be relatively small in volume (due to rocket launch profiles), and therefore current traffic patterns should be unaffected. However, a holistic approach is required to consider the wider impact that subsequent activation of the EG D701 Danger Areas, (and any additional airspace requirements beyond EG D701, including a bespoke modular design) will have, in particular on the NAT tracks. Any deviation caused by unavailability of OEPs will have to be carefully considered in the airspace design to understand the environmental impact of additional miles flown by aircraft forced to deviate from route. It is further acknowledged that rocket launch from the site at Scolpaig will create noise, emissions and light pollution; and these elements will need to be considered in the airspace design especially where they are traded off against minimising disruption to Commercial Air Transport (CAT). Many of these environmental issues are being considered within the planning application and associated EIA; the latter will help inform part of the ACP process.		

DP8	Regulatory	The airspace design will need to consider any emerging regulations pertaining to spaceports and Ranges under the spaceport act 2018
It is recognised that the airspace design might be influenced by the secondary legislation to the Space Industry Act 2018. The design principles will take account of any additional legislative requirements, in particular where these are linked to the Spaceport operator licence and Range operator licence.		

DP9	Operational	Rocket stage drop zones may be required outside the EG D701 Areas and will need to be considered
For orbital rocket launch it is expected that these may have one or more rocket stages that will separate after launch. Where separation and return to earth occurs outside the EG D701 complex additional segregated airspace will be required – The design principle should include the most efficient use of airspace to accommodate this requirement.		

3 How to Provide Feedback

Feedback can be provided by email to the airspace change manager at: SP1ACP@QinetiQ.com. Additionally, you will be invited to participate in a WebEx event week commencing 30th August where more background information will be provided on the airspace design and any concerns or issues can be voiced.

You are politely requested to provide any response regarding the Draft Airspace Design Principles by Monday 6th September 2021.

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