

Space Hub Sutherland Design Principles

Stakeholder Review Document



Highlands and Islands Enterprise
Iomairt na Gàidhealtachd 's nan Eilean

Space Hub Sutherland Airspace Change Proposal

Introduction

Highlands and Islands Enterprise (HIE) is very grateful to those stakeholders who have already engaged with this process and for the views provided by the various representative bodies and individuals. The responses we have received have helped us to develop a comprehensive list of potential Design Principles that reflect the comments made during Focus Group meetings and from completed questionnaires. We are now sharing those Design Principles with all stakeholders for your views.

It is stressed that this engagement takes into consideration only those factors that affect the design of the Space Hub Sutherland (SHS) Airspace Change Proposal (ACP). Comments relating to the construction of the spaceport and launch activities themselves are addressed in other workstreams and regulatory activities.

The Design Principles will be used as the qualitative framework against which different design options will be considered. It is therefore important that your views have been accurately captured. This document has been prepared to share the potential Design Principles and we now need your help to provide further comment and to help us understand which Design Principles are most important to you or your organisation.

Any changes to airspace arrangements must maintain or enhance safety. This is the main priority of the CAA in accordance with its statutory duties set out in Section 70(1) of the Transport Act 2000. For the SHS ACP, the principal aim is to provide protection to airspace users for whom launch activities might pose a hazard. Safety is therefore the overarching principle against which the design options will be developed.

In addition, the airspace designed for Space Hub Sutherland will be managed by a Range Control Service Provider, in receipt of a Range Control Licence under the Space Industry Act (2018). However, the regulations governing the provision of a Range Control licence have not yet been finalised. As a result, the airspace management procedures identified in this ACP will be drafted so they can dovetail with the future requirements of the Range Control Service Provider.

Stakeholder Review Requirement

Please review the Design Principles listed in Error! Reference source not found. below. For each one, we would like you to state whether or not you agree that the statement constitutes a Design Principle. If you do not agree, please provide detailed comments in the box provided.

In addition, we would like you to rank the Design Principles according to your, or your organisation's priorities. Please rank the Design Principles from 1 (Highest priority) to 12 (Lowest priority). If you feel any of the Design Principles are not applicable to you, please mark them as '0'. Please add any amplifying comments that you wish to include within the comments box.

If you would like to provide additional comments, raise any concerns that you feel have not been considered, or suggest any additional Design Principles, please complete **Error! Reference source not found.**

How to Respond

Please save the file that includes your responses and attach it to an email to the following address:

spacehubsutherland@hient.co.uk

In addition to attachments in MS Word, we will accept .pdf, scanned, hand-written or email responses, as long as they are legible and clearly identify the Design Principle to which your response relates.

It is important that individual email responses clearly show your name and contact details; this will allow us to cross-refer to the emails that we send out.

We will also accept legible postal responses to the following address within the timescales specified below:

Airspace Change Proposal
Space Hub Sutherland
Osprey Consulting Services Limited
Suite 10,
The Hub,
Fowler Avenue
Farnborough
GU14 7JP

Responses must reach us no later than 12.00 mid-day 07 November 2019

Next Steps

The development of Design Principles will mark the completion of Stage 1 (Define Stage) of the SHS ACP. The response you now provide will help us to refine the Design Principles ahead of the Civil Aviation Authority (CAA) DEFINE Gateway, the first of four gateways in the seven stage CAP 1616 process.

Passing the CAA DEFINE Gateway will allow us to begin detailed airspace design work. Further engagement will be undertaken during the design phase, ahead of the DEVELOP and ASSESS Gateway which is currently planned for 31 January 2020. It is anticipated that formal consultation will be conducted no earlier than May 2020. HIE will ensure any views expressed through this earlier engagement activity will also be recorded to inform the full consultation report.

Review of Design Principles

Your Responses

Please complete **Error! Reference source not found.** and **Error! Reference source not found.** below in line with the information provided in Section 1. Please use as much space as you require, the size of the response box will expand as you type your response.

	Design Principle	Rationale	Do you agree this is a Design Principle? (Yes or No)	How would you rank this Design Principle as a priority? (1-12 or 0)
DP1	The safety of other airspace users is the paramount consideration in the design of the ACP.	SIA (2018) makes reference to ‘aircraft to which spaceflight activities might pose a hazard and aircraft that might pose a hazard to spaceflight activities’, so covering both eventualities.	N/A	0
Comments: Not relevant to our remit, but accept approach sounds sensible.				
DP2	In accordance with Flexible Use of Airspace (FUA) principles, the volume of segregated Special Use Airspace (SUA) defined will be of the minimum dimensions necessary, activated for the minimum duration required, to ensure the safety of other airspace users whilst minimising its impact.	<p>The background classification of the airspace will remain Class G (uncontrolled).</p> <p>The term ‘other airspace users’ includes Commercial Air Transport (CAT), military aircraft and General Aviation (GA) and includes both fixed wing aircraft and helicopters. Although segregated SUA is being considered as the most likely solution, other methods such as ‘clear range’ as used by naval forces, will also be investigated.</p> <p>As it is assumed that the airspace will be segregated for the duration of the spaceflight activity, it is unlikely that solutions such</p>	N/A	0

	Design Principle	Rationale	Do you agree this is a Design Principle? (Yes or No)	How would you rank this Design Principle as a priority? (1-12 or 0)
		<p>as Radio Mandatory Zones (RMZs) and Transponder Mandatory Zones (TMZs) would be appropriate.</p> <p>The dimensions of the required volume of airspace will be defined by the trajectories required by spacecraft launching from SHS, supplemented by a launch safety analysis of various failure modes.</p> <p>To cater for a variety of launch vehicles, the airspace designed could form a mosaic of sectors, with only the specific sector required for a given launch activated at any one time. A small zone in the immediate vicinity of the spaceport may also be required for potentially hazardous, but non-launch, activities, such as fuelling.</p>		
Comments: Not within our remit, but accept approach sounds sensible.				
DP3	SHS will only be for vertical launches to put small satellites into orbit.	No horizontal launches or manned spaceflights are proposed from SHS and there will be no runway associated with the site.	Yes	1
Comments: The area surrounding the proposal area is covered by a number of protected areas for either nature conservation or special landscapes, so use of land within those areas would be of concern.				
DP4	The SHS ACP shall take into account the implications for SUA of Free Route Airspace (FRA) and CAP 1711, which will impact upon the design of	The CAA is leading the UK Flexible Use of Airspace State Project (FSP) and, with NATS and the Ministry of Defence (MOD), is looking at Advanced Flexible Use of Airspace (AFUA). AFUA is considering the processes, decision-making and technology required to optimise the management of airspace including the	N/A	0

	Design Principle	Rationale	Do you agree this is a Design Principle? (Yes or No)	How would you rank this Design Principle as a priority? (1-12 or 0)
	associated Flight Planning Buffer Zones (FBZ) and on notification requirements.	notification, promulgation and activation of SUA. It is understood that the MOD is engaged with NATS as a stakeholder in their FRA ACP. Where appropriate, the SHS ACP would like either to contribute to, or be informed by, ongoing discussions on AFUA.		
Comments: Not within our remit and don't have expertise to adequately comment.				
DP5	The SHS ACP shall employ current and evolving best practice in the notification, activation and deactivation of the SHS airspace.	It is recognised that for the implementation of the SHS ACP to be successful, effective interagency planning and coordination will be essential. This will include notification and coordination (in accordance with recognised timescales) utilising the UK Airspace Management Cell (AMC) and the EU Network Manager via the Airspace Usage Plan (AUP). Such notifications could employ automated processes such as the EUROCONTROL Airspace management tool LARA (see LINK).	Yes	2
Comments: Following current and evolving best practice is a sensible approach to take.				
DP6	As part of the design process, the priority afforded to the proposed airspace will need to be agreed, and subsequently managed, in line with government priorities and taking account of, for example, adjacent MOD FUA.	<p>Procedures will need to be in place to allow the transit of priority aircraft including Category A (e.g. aircraft in emergency), Category B (e.g. Search and Rescue) and, in addition, Defence Operational Tasking (e.g. Air Defence Priority Flights).</p> <p>On a broader scale, priorities will also need to be agreed between NATS, MOD and the SHS airspace operator, and co-ordinated with both QinetiQ and the MOD, to ensure that the overall effect of multiple segregated airspace requirements do not overly impact upon the UK Upper Airspace network ability to maintain a viable solution for commercial aviation.</p>	N/A	0

	Design Principle	Rationale	Do you agree this is a Design Principle? (Yes or No)	How would you rank this Design Principle as a priority? (1-12 or 0)
		The activation of the SHS SUA should also take account of large-scale biannual military exercises, with their associated temporary segregated airspace.		
Comments: Not within our remit or expertise to comment.				
DP7	The airspace design shall include the development of Letters of Agreement (LoA) and Memoranda of Understanding (MoU) between relevant parties.	NATS is working with the UKSA and CAA to provide a template LOA, as NATS expects that due to the anticipated dimensions and activation cycles that all ranges as defined by the SIA will require LOAs in respect of notification principles and methodologies.	N/A	0
Comments: Not within our remit or expertise, but sounds a sensible approach.				
DP8	The airspace design will aim to minimise the re-routing of aircraft, including those low-flying.	The re-routing of aircraft, especially those low-flying, could result in additional disturbance for breeding and wintering populations of birds in north Sutherland, which will be carefully considered in the development of the ACP.	N/A	0
Comments: Not relevant to our remit.				
DP9	The proposal will comply with internationally recognised norms for related spaceflight activities that transit the airspace of other states.	The trajectories of spacecraft launching from SHS are likely to include the overflight of other states' airspace. It is understood that UK government is already in discussion with neighbouring states likely to be affected and the ACP will be guided by the outcome of those discussions.	N/A	0
Comments: Not within our remit or expertise.				

	Design Principle	Rationale	Do you agree this is a Design Principle? (Yes or No)	How would you rank this Design Principle as a priority? (1-12 or 0)
DP10	The ACP may seek to legally prohibit overflight of some areas associated with the SHS operation through the application of byelaws or Statutory Instruments (SIs).	There may be a requirement, rather than only to notify other airspace users of spaceflight activities from SHS by the activation of SUA, to legally prohibit overflight of some areas. If this proves to be the case, the ACP will be developed to include this requirement.	N/A	0
Comments: Not relevant to our interests.				
DP11	HIE will be required to undertake an Environmental Assessment associated with the re-routing of aircraft to avoid SUA.	The SHS ACP is not associated with an airport. While there are environmental impacts associated with spaceflight launch from SHS, with the exception of aircraft rerouted to avoid SUA, there are no aviation environmental effects associated with the proposal. Therefore, many of the aviation-related environmental impacts required by CAP 1616, such as 16 hr LA _{eq} and 8 Hr LA _{eq} Noise Contours, CO ₂ emissions, tranquillity and local air quality are not applicable to the ACP. Environmental impacts will be fully addressed in other regulatory activities associated with the SHS, such as the site Planning Application and Spaceport, Range Control and Operator licence applications.	Yes	3
Comments: Seems a sensible approach.				
DP12	The ACP will take into account other regulatory requirements associated with SHS and, where available and appropriate, will reuse existing assessments	The secondary legislation and guidance associated with the SIA (2018) has not yet been issued. The Act includes the requirement for the issue of several licences associated with operations from SHS, such as a Spaceport Licence, Range Control licence and Operator licence. The ACP will take account of any requirements associated with these various licences in its development.	N/A	

If there are any other areas of concern that you feel have not been considered, please provide additional comments below.

Comments:

Are there other Design Principles not included in the list that you feel should be considered as candidates for the final shortlist? If so, please provide your comments.

Comments:

Review of Design Principles

Your Responses

Please complete **Error! Reference source not found.** and **Error! Reference source not found.** below in line with the information provided in Section 1. Please use as much space as you require, the size of the response box will expand as you type your response.

	Design Principle	Rationale	Do you agree this is a Design Principle? (Yes or No)	How would you rank this Design Principle as a priority? (1-12 or 0)
DP1	The safety of other airspace users is the paramount consideration in the design of the ACP.	SIA (2018) makes reference to ‘aircraft to which spaceflight activities might pose a hazard and aircraft that might pose a hazard to spaceflight activities’, so covering both eventualities.	Yes	12
Comments:				
DP2	In accordance with Flexible Use of Airspace (FUA) principles, the volume of segregated Special Use Airspace (SUA) defined will be of the minimum dimensions necessary, activated for the minimum duration required, to ensure the safety of other airspace users whilst minimising its impact.	<p>The background classification of the airspace will remain Class G (uncontrolled).</p> <p>The term ‘other airspace users’ includes Commercial Air Transport (CAT), military aircraft and General Aviation (GA) and includes both fixed wing aircraft and helicopters. Although segregated SUA is being considered as the most likely solution, other methods such as ‘clear range’ as used by naval forces, will also be investigated.</p> <p>As it is assumed that the airspace will be segregated for the duration of the spaceflight activity, it is unlikely that solutions such</p>	Yes	11

	Design Principle	Rationale	Do you agree this is a Design Principle? (Yes or No)	How would you rank this Design Principle as a priority? (1-12 or 0)
		<p>as Radio Mandatory Zones (RMZs) and Transponder Mandatory Zones (TMZs) would be appropriate.</p> <p>The dimensions of the required volume of airspace will be defined by the trajectories required by spacecraft launching from SHS, supplemented by a launch safety analysis of various failure modes.</p> <p>To cater for a variety of launch vehicles, the airspace designed could form a mosaic of sectors, with only the specific sector required for a given launch activated at any one time. A small zone in the immediate vicinity of the spaceport may also be required for potentially hazardous, but non-launch, activities, such as fuelling.</p>		
Comments:				
DP3	SHS will only be for vertical launches to put small satellites into orbit.	No horizontal launches or manned spaceflights are proposed from SHS and there will be no runway associated with the site.	Yes	6
Comments:				
DP4	The SHS ACP shall take into account the implications for SUA of Free Route Airspace (FRA) and CAP 1711, which will impact upon the design of associated Flight Planning	The CAA is leading the UK Flexible Use of Airspace State Project (FSP) and, with NATS and the Ministry of Defence (MOD), is looking at Advanced Flexible Use of Airspace (AFUA). AFUA is considering the processes, decision-making and technology required to optimise the management of airspace including the notification, promulgation and activation of SUA. It is understood	Yes	10

	Design Principle	Rationale	Do you agree this is a Design Principle? (Yes or No)	How would you rank this Design Principle as a priority? (1-12 or 0)
	Buffer Zones (FBZ) and on notification requirements.	that the MOD is engaged with NATS as a stakeholder in their FRA ACP. Where appropriate, the SHS ACP would like either to contribute to, or be informed by, ongoing discussions on AFUA.		
Comments:				
DP5	The SHS ACP shall employ current and evolving best practice in the notification, activation and deactivation of the SHS airspace.	It is recognised that for the implementation of the SHS ACP to be successful, effective interagency planning and coordination will be essential. This will include notification and coordination (in accordance with recognised timescales) utilising the UK Airspace Management Cell (AMC) and the EU Network Manager via the Airspace Usage Plan (AUP). Such notifications could employ automated processes such as the EUROCONTROL Airspace management tool LARA (see LINK).	Yes	12
Comments:				
DP6	As part of the design process, the priority afforded to the proposed airspace will need to be agreed, and subsequently managed, in line with government priorities and taking account of, for example, adjacent MOD FUA.	<p>Procedures will need to be in place to allow the transit of priority aircraft including Category A (e.g. aircraft in emergency), Category B (e.g. Search and Rescue) and, in addition, Defence Operational Tasking (e.g. Air Defence Priority Flights).</p> <p>On a broader scale, priorities will also need to be agreed between NATS, MOD and the SHS airspace operator, and co-ordinated with both QinetiQ and the MOD, to ensure that the overall effect of multiple segregated airspace requirements do not overly impact upon the UK Upper Airspace network ability to maintain a viable solution for commercial aviation.</p>	No issue raised	Nil

	Design Principle	Rationale	Do you agree this is a Design Principle? (Yes or No)	How would you rank this Design Principle as a priority? (1-12 or 0)
		The activation of the SHS SUA should also take account of large-scale biannual military exercises, with their associated temporary segregated airspace.		
Comments:				
DP7	The airspace design shall include the development of Letters of Agreement (LoA) and Memoranda of Understanding (MoU) between relevant parties.	NATS is working with the UKSA and CAA to provide a template LOA, as NATS expects that due to the anticipated dimensions and activation cycles that all ranges as defined by the SIA will require LOAs in respect of notification principles and methodologies.	yes	10
Comments:				
DP8	The airspace design will aim to minimise the re-routing of aircraft, including those low-flying.	The re-routing of aircraft, especially those low-flying, could result in additional disturbance for breeding and wintering populations of birds in north Sutherland, which will be carefully considered in the development of the ACP.	Yes	12
Comments: HIAL should be able to Assist with the Low level considerations.				
DP9	The proposal will comply with internationally recognised norms for related spaceflight activities that transit the airspace of other states.	The trajectories of spacecraft launching from SHS are likely to include the overflight of other states' airspace. It is understood that UK government is already in discussion with neighbouring states likely to be affected and the ACP will be guided by the outcome of those discussions.	Yes	6
Comments:				

	Design Principle	Rationale	Do you agree this is a Design Principle? (Yes or No)	How would you rank this Design Principle as a priority? (1-12 or 0)
DP10	The ACP may seek to legally prohibit overflight of some areas associated with the SHS operation through the application of byelaws or Statutory Instruments (SIs).	There may be a requirement, rather than only to notify other airspace users of spaceflight activities from SHS by the activation of SUA, to legally prohibit overflight of some areas. If this proves to be the case, the ACP will be developed to include this requirement.	Yes	12
Comments: HIAL will be able to assist in design and monitoring of this.				
DP11	HIE will be required to undertake an Environmental Assessment associated with the re-routing of aircraft to avoid SUA.	The SHS ACP is not associated with an airport. While there are environmental impacts associated with spaceflight launch from SHS, with the exception of aircraft rerouted to avoid SUA, there are no aviation environmental effects associated with the proposal. Therefore, many of the aviation-related environmental impacts required by CAP 1616, such as 16 hr LA _{eq} and 8 Hr LA _{eq} Noise Contours, CO ₂ emissions, tranquillity and local air quality are not applicable to the ACP. Environmental impacts will be fully addressed in other regulatory activities associated with the SHS, such as the site Planning Application and Spaceport, Range Control and Operator licence applications.	Yes	6
Comments:				
DP12	The ACP will take into account other regulatory requirements associated with SHS and, where available and appropriate, will reuse existing assessments	The secondary legislation and guidance associated with the SIA (2018) has not yet been issued. The Act includes the requirement for the issue of several licences associated with operations from SHS, such as a Spaceport Licence, Range Control licence and Operator licence. The ACP will take account of any requirements associated with these various licences in its development.	Yes	5

If there are any other areas of concern that you feel have not been considered, please provide additional comments below.

Comments:

Are there other Design Principles not included in the list that you feel should be considered as candidates for the final shortlist? If so, please provide your comments.

Comments:

Review of Design Principles

Your Responses

Please complete **Error! Reference source not found.** and **Error! Reference source not found.** below in line with the information provided in Section 1. Please use as much space as you require, the size of the response box will expand as you type your response.

	Design Principle	Rationale	Do you agree this is a Design Principle? (Yes or No)	How would you rank this Design Principle as a priority? (1-12 or 0)
DP1	The safety of other airspace users is the paramount consideration in the design of the ACP.	SIA (2018) makes reference to 'aircraft to which spaceflight activities might pose a hazard and aircraft that might pose a hazard to spaceflight activities', so covering both eventualities.	YES	1
Comments:				
DP2	In accordance with Flexible Use of Airspace (FUA) principles, the volume of segregated Special Use Airspace (SUA) defined will be of the minimum dimensions necessary, activated for the minimum duration required, to ensure the safety of other airspace users whilst minimising its impact.	<p>The background classification of the airspace will remain Class G (uncontrolled).</p> <p>The term 'other airspace users' includes Commercial Air Transport (CAT), military aircraft and General Aviation (GA) and includes both fixed wing aircraft and helicopters. Although segregated SUA is being considered as the most likely solution, other methods such as 'clear range' as used by naval forces, will also be investigated.</p> <p>As it is assumed that the airspace will be segregated for the duration of the spaceflight activity, it is unlikely that solutions such as Radio Mandatory Zones (RMZs) and Transponder Mandatory</p>	YES	1

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	Design Principle	Rationale	Do you agree this is a Design Principle? (Yes or No)	How would you rank this Design Principle as a priority? (1-12 or 0)
		<p>Zones (TMZs) would be appropriate.</p> <p>The dimensions of the required volume of airspace will be defined by the trajectories required by spacecraft launching from SHS, supplemented by a launch safety analysis of various failure modes.</p> <p>To cater for a variety of launch vehicles, the airspace designed could form a mosaic of sectors, with only the specific sector required for a given launch activated at any one time. A small zone in the immediate vicinity of the spaceport may also be required for potentially hazardous, but non-launch, activities, such as fuelling.</p>		
Comments:				
DP3	SHS will only be for vertical launches to put small satellites into orbit.	No horizontal launches or manned spaceflights are proposed from SHS and there will be no runway associated with the site.	YES	3
Comments:				
DP4	The SHS ACP shall take into account the implications for SUA of Free Route Airspace (FRA) and CAP 1711, which will impact upon the design of associated Flight Planning Buffer Zones (FBZ) and on	The CAA is leading the UK Flexible Use of Airspace State Project (FSP) and, with NATS and the Ministry of Defence (MOD), is looking at Advanced Flexible Use of Airspace (AFUA). AFUA is considering the processes, decision-making and technology required to optimise the management of airspace including the notification, promulgation and activation of SUA. It is understood that the MOD is engaged with NATS as a stakeholder in their FRA	YES	4

	Design Principle	Rationale	Do you agree this is a Design Principle? (Yes or No)	How would you rank this Design Principle as a priority? (1-12 or 0)
	notification requirements.	ACP. Where appropriate, the SHS ACP would like either to contribute to, or be informed by, ongoing discussions on AFUA.		
Comments:				
DP5	The SHS ACP shall employ current and evolving best practice in the notification, activation and deactivation of the SHS airspace.	It is recognised that for the implementation of the SHS ACP to be successful, effective interagency planning and coordination will be essential. This will include notification and coordination (in accordance with recognised timescales) utilising the UK Airspace Management Cell (AMC) and the EU Network Manager via the Airspace Usage Plan (AUP). Such notifications could employ automated processes such as the EUROCONTROL Airspace management tool LARA (see LINK).	YES	1
Comments:				
DP6	As part of the design process, the priority afforded to the proposed airspace will need to be agreed, and subsequently managed, in line with government priorities and taking account of, for example, adjacent MOD FUA.	<p>Procedures will need to be in place to allow the transit of priority aircraft including Category A (e.g. aircraft in emergency), Category B (e.g. Search and Rescue) and, in addition, Defence Operational Tasking (e.g. Air Defence Priority Flights).</p> <p>On a broader scale, priorities will also need to be agreed between NATS, MOD and the SHS airspace operator, and co-ordinated with both QinetiQ and the MOD, to ensure that the overall effect of multiple segregated airspace requirements do not overly impact upon the UK Upper Airspace network ability to maintain a viable solution for commercial aviation.</p> <p>The activation of the SHS SUA should also take account of large-scale biannual military exercises, with their associated temporary</p>	No issue raised	Nil

	Design Principle	Rationale	Do you agree this is a Design Principle? (Yes or No)	How would you rank this Design Principle as a priority? (1-12 or 0)
		segregated airspace.		
Comments:				
DP7	The airspace design shall include the development of Letters of Agreement (LoA) and Memoranda of Understanding (MoU) between relevant parties.	NATS is working with the UKSA and CAA to provide a template LOA, as NATS expects that due to the anticipated dimensions and activation cycles that all ranges as defined by the SIA will require LOAs in respect of notification principles and methodologies.	YES	6
Comments:				
DP8	The airspace design will aim to minimise the re-routing of aircraft, including those low-flying.	The re-routing of aircraft, especially those low-flying, could result in additional disturbance for breeding and wintering populations of birds in north Sutherland, which will be carefully considered in the development of the ACP.	YES	2
Comments:				
DP9	The proposal will comply with internationally recognised norms for related spaceflight activities that transit the airspace of other states.	The trajectories of spacecraft launching from SHS are likely to include the overflight of other states' airspace. It is understood that UK government is already in discussion with neighbouring states likely to be affected and the ACP will be guided by the outcome of those discussions.	YES	6
Comments:				
DP10	The ACP may seek to legally prohibit overflight of some areas associated with the SHS	There may be a requirement, rather than only to notify other airspace users of spaceflight activities from SHS by the activation of SUA, to legally prohibit overflight of some areas. If this proves	YES	2

	Design Principle	Rationale	Do you agree this is a Design Principle? (Yes or No)	How would you rank this Design Principle as a priority? (1-12 or 0)
	operation through the application of byelaws or Statutory Instruments (SIs).	to be the case, the ACP will be developed to include this requirement.		
Comments:				
DP11	HIE will be required to undertake an Environmental Assessment associated with the re-routing of aircraft to avoid SUA.	The SHS ACP is not associated with an airport. While there are environmental impacts associated with spaceflight launch from SHS, with the exception of aircraft rerouted to avoid SUA, there are no aviation environmental effects associated with the proposal. Therefore, many of the aviation-related environmental impacts required by CAP 1616, such as 16 hr LA _{eq} and 8 Hr LA _{eq} Noise Contours, CO ₂ emissions, tranquillity and local air quality are not applicable to the ACP. Environmental impacts will be fully addressed in other regulatory activities associated with the SHS, such as the site Planning Application and Spaceport, Range Control and Operator licence applications.	YES	10
Comments:				
DP12	The ACP will take into account other regulatory requirements associated with SHS and, where available and appropriate, will reuse existing assessments	The secondary legislation and guidance associated with the SIA (2018) has not yet been issued. The Act includes the requirement for the issue of several licences associated with operations from SHS, such as a Spaceport Licence, Range Control licence and Operator licence. The ACP will take account of any requirements associated with these various licences in its development.	YES	6

If there are any other areas of concern that you feel have not been considered, please provide additional comments below.

Comments:

Are there other Design Principles not included in the list that you feel should be considered as candidates for the final shortlist? If so, please provide your comments.

Comments:



Ministry
of Defence

Defence Airspace & Air Traffic Management
CAA Aviation House, 1E
Gatwick Airport South
West Sussex
RH6 0YR

Telephone: [REDACTED]

Email: [REDACTED]

Airspace Change,
Space Hub Sutherland,
Osprey Consulting Services Ltd,
Suite 10, The Hub,
Fowler Avenue,
Farnborough
GU14 7JP

11 Nov 19

Dear Sir / Madam,

MINISTRY OF DEFENCE (MOD) RESPONSE TO SPACE HUB SUTHERLAND ACP DESIGN PRINCIPLES

1. Thank you for your recent engagement and the opportunity to comment on your draft design principles. Please see below our comments as requested on the template provided. Whilst we appreciate the tight time frames and deadlines associated with this ACP work, and appreciate your extension to allow the MOD response, we would be grateful for more time to consider your proposals with MOD stakeholders and respond in the future.
2. The MOD remains committed to ensuring airspace is used safely, efficiently and flexibly. Future airspace design must consider and allow for continued MOD access to airspace in order to meet defence operational and training requirements. In particular, MOD would wish to draw your attention to the potential implications on use of Cape Wrath Range (EGD801 /802/803).
3. The MOD seeks to work closely with Space Hub Sutherland and welcomes continued engagement throughout the ACP process. Please do not hesitate to contact the undersigned if you require any further information at this stage.

Yours faithfully,

[*signed electronically*]

[REDACTED]
Squadron Leader
SO2 Airspace Plans

Review of Design Principles

Your Responses

Please complete below in line with the information provided in Section 1. Please use as much space as you require, the size of the response box will expand as you type your response. **MOD responses and comments are annotated in red.**

	Design Principle	Rationale	Do you agree this is a Design Principle? (Yes or No)	How would you rank this Design Principle as a priority? (1-12 or 0)
DP1	The safety of other airspace users is the paramount consideration in the design of the ACP.	SIA (2018) makes reference to 'aircraft to which spaceflight activities might pose a hazard and aircraft that might pose a hazard to spaceflight activities', so covering both eventualities.	Yes	
Comments:				
DP2	In accordance with Flexible Use of Airspace (FUA) principles, the volume of segregated Special Use Airspace (SUA) defined will be of the minimum dimensions necessary, activated for the minimum duration required, to ensure the safety of other airspace users whilst minimising its impact.	<p>The background classification of the airspace will remain Class G (uncontrolled). It is unclear what is meant by this statement. MOD suggest that this be reworded to "The background classification of the airspace will remain unchanged".</p> <p>The term 'other airspace users' includes Commercial Air Transport (CAT), military aircraft and General Aviation (GA) and includes both fixed wing aircraft and helicopters. Are unmanned air systems being considered in the remit of other airspace users? From an MOD perspective it is not only aircraft that need to be considered but also includes weapons and fires from air, ground and maritime based assets that utilise airspace to meet defence operational and training requirements.</p> <p>Although segregated SUA is being considered as the most likely solution, other methods such as 'clear range' as used by naval</p>	Yes	

	Design Principle	Rationale	Do you agree this is a Design Principle? (Yes or No)	How would you rank this Design Principle as a priority? (1-12 or 0)
		<p>forces, will also be investigated. The MOD are keen to engage and would wish to understand any procedures that may be utilised and responsibilities. The MOD would also wish to ensure that the terms used for procedures are not ambiguous and cannot be easily mis-interpreted or confused with current procedures utilised by other agencies.</p> <p>As it is assumed that the airspace will be segregated for the duration of the spaceflight activity, it is unlikely that solutions such as Radio Mandatory Zones (RMZs) and Transponder Mandatory Zones (TMZs) would be appropriate.</p> <p>The dimensions of the required volume of airspace will be defined by the trajectories required by spacecraft launching from SHS, supplemented by a launch safety analysis of various failure modes.</p> <p>To cater for a variety of launch vehicles, the airspace designed could form a mosaic of sectors, with only the specific sector required for a given launch activated at any one time. A small zone in the immediate vicinity of the spaceport may also be required for potentially hazardous, but non-launch, activities, such as fuelling.</p>		
Comments:				
DP3	SHS will only be for vertical launches to put small satellites into orbit.	No horizontal launches or manned spaceflights are proposed from SHS and there will be no runway associated with the site.	Yes	
Comments:				

	Design Principle	Rationale	Do you agree this is a Design Principle? (Yes or No)	How would you rank this Design Principle as a priority? (1-12 or 0)
DP4	The SHS ACP shall take into account the implications for SUA of Free Route Airspace (FRA) and CAP 1711, which will impact upon the design of associated Flight Planning Buffer Zones (FBZ) and on notification requirements.	The CAA is leading the UK Flexible Use of Airspace State Project (FSP) and, with NATS and the Ministry of Defence (MOD), is looking at Advanced Flexible Use of Airspace (AFUA). AFUA is considering the processes, decision-making and technology required to optimise the management of airspace including the notification, promulgation and activation of SUA. It is understood that the MOD is engaged with NATS as a stakeholder in their FRA ACP. The MOD is not the only stake holder; FRA will be a series of ACPs as FRA will be implemented in a series of deployments. More information can be found on the CAA Airspace Change Portal. Where appropriate, the SHS ACP would like either to contribute to, or be informed by, ongoing discussions on AFUA.	Yes	
Comments:				
DP5	The SHS ACP shall employ current and evolving best practice in the notification, activation and deactivation of the SHS airspace.	It is recognised that for the implementation of the SHS ACP to be successful, effective interagency planning and coordination will be essential. This will include notification and coordination (in accordance with recognised timescales) utilising the UK Airspace Management Cell (AMC) and the EU Network Manager via the Airspace Usage Plan (AUP). Such notifications could employ automated processes such as the EUROCONTROL Airspace management tool LARA (see LINK). The MOD are keen to engage further on this, in conjunction with NATS, in relation to CAP740. (e.g. to understand primacy, how Level 2 / Level 3 management will be conducted.)	Yes	
Comments:				
DP6	As part of the design process,	Procedures will need to be in place to allow the transit of priority	Yes	

	Design Principle	Rationale	Do you agree this is a Design Principle? (Yes or No)	How would you rank this Design Principle as a priority? (1-12 or 0)
	<p>the priority afforded to the proposed airspace will need to be agreed, and subsequently managed, in line with government priorities and taking account of, for example, adjacent MOD FUA.</p> <p>It is unclear what is meant by "MOD FUA"; grateful for clarification.</p>	<p>aircraft including Category A (e.g. aircraft in emergency), Category B (e.g. Search and Rescue) and, in addition, Defence Operational Tasking (e.g. Air Defence Priority Flights). Noting that the proposed launch site lies within close proximity to EG D802, the MOD believes that consideration also must be given to the priority afforded to activity within Cape Wrath range (EG D801/802/803). It is anticipated, at this stage, that any activity at SHS would potentially result in the non-availability of Cape Wrath Range throughout the airspace activation period. It should be noted that requests for use of Cape Wrath can come at short notice (1 week or less) and this is the only location that some essential military activities can be conducted. (e.g. joint fires activity between air/land/maritime assets.)</p> <p>On a broader scale, priorities will also need to be agreed between NATS, MOD and the SHS airspace operator, and co-ordinated with both QinetiQ and the MOD, to ensure that the overall effect of multiple segregated airspace requirements do not overly impact upon the UK Upper Airspace network ability to maintain a viable solution for commercial aviation.</p> <p>Whilst MOD broadly agree with the intent of this statement, there does need to be consideration of the overall impact to the civil ATM Network balanced with each users' requirements for airspace to ensure that impact is minimised and managed for all airspace users where possible.</p> <p>The activation of the SHS SUA should also take account of large-scale biannual military exercises, with their associated temporary segregated airspace. This does not just include temporary segregated airspace but also unsegregated airspace where activity takes place during large scale exercises and routine activity.</p>		

	Design Principle	Rationale	Do you agree this is a Design Principle? (Yes or No)	How would you rank this Design Principle as a priority? (1-12 or 0)
Comments:				
DP7	The airspace design shall include the development of Letters of Agreement (LoA) and Memoranda of Understanding (MoU) between relevant parties.	NATS is working with the UKSA and CAA to provide a template LOA, as NATS expects that due to the anticipated dimensions and activation cycles that all ranges as defined by the SIA will require LOAs in respect of notification principles and methodologies. The MOD potentially foresee the requirement for MoU / LoA's between SHS and MOD and remain keen to engage.	Yes	
Comments:				
DP8	The airspace design will aim to minimise the re-routing of aircraft, including those low-flying. The MOD would seek to minimise impact to all other airspace users. (Not just re-routing or associated with environmental factors.) Any new airspace restrictions could affect other airspace users' ability to access airspace essential to safely deliver their operations e.g. defence training and operational requirements. See additional comments below.	The re-routing of aircraft, especially those low-flying, could result in additional disturbance for breeding and wintering populations of birds in north Sutherland, which will be carefully considered in the development of the ACP.	Yes - partially	
Comments:				
DP9	The proposal will comply with	The trajectories of spacecraft launching from SHS are likely to	Yes	

	Design Principle	Rationale	Do you agree this is a Design Principle? (Yes or No)	How would you rank this Design Principle as a priority? (1-12 or 0)
	internationally recognised norms for related spaceflight activities that transit the airspace of other states.	include the overflight of other states' airspace. It is understood that UK government is already in discussion with neighbouring states likely to be affected and the ACP will be guided by the outcome of those discussions. The MOD are aware and are keen to understand the policy, and agreements, as they are developed.		
Comments:				
DP10	The ACP may seek to legally prohibit overflight of some areas associated with the SHS operation through the application of byelaws or Statutory Instruments (SIs).	<p>There may be a requirement, rather than only to notify other airspace users of spaceflight activities from SHS by the activation of SUA, to legally prohibit overflight of some areas. If this proves to be the case, the ACP will be developed to include this requirement. The MOD would wish to further understand the rationale and requirement for this proposal and the potential implications for other airspace users. The MOD would also wish to understand how this would work in terms of the airspace design e.g. would this be permanent or temporary.</p> <p>As per above (DP6) Noting that the proposed launch site lies within close proximity to EG D802, the MOD believes that consideration also must be given to the priority afforded to activity within Cape Wrath range (EG D801/802/803). It is anticipated, at this stage, that any activity at SHS would potentially result in the non-availability of Cape Wrath Range throughout the airspace activation period. It should be noted that requests for use of Cape Wrath can come at short notice (1 week or less) and this is the only location that some essential military activities can be conducted. (e.g. joint fires activity between air/land/maritime assets.)</p>		
Comments:				

	Design Principle	Rationale	Do you agree this is a Design Principle? (Yes or No)	How would you rank this Design Principle as a priority? (1-12 or 0)
DP11	HIE will be required to undertake an Environmental Assessment associated with the re-routing of aircraft to avoid SUA.	The SHS ACP is not associated with an airport. While there are environmental impacts associated with spaceflight launch from SHS, with the exception of aircraft rerouted to avoid SUA, there are no aviation environmental effects associated with the proposal. Therefore, many of the aviation-related environmental impacts required by CAP 1616, such as 16 hr LA _{eq} and 8 Hr LA _{eq} Noise Contours, CO ₂ emissions, tranquillity and local air quality are not applicable to the ACP. Environmental impacts will be fully addressed in other regulatory activities associated with the SHS, such as the site Planning Application and Spaceport, Range Control and Operator licence applications.	No comment.	
Comments:				
DP12	The ACP will take into account other regulatory requirements associated with SHS and, where available and appropriate, will reuse existing assessments	The secondary legislation and guidance associated with the SIA (2018) has not yet been issued. The Act includes the requirement for the issue of several licences associated with operations from SHS, such as a Spaceport Licence, Range Control licence and Operator licence. The ACP will take account of any requirements associated with these various licences in its development.		

If there are any other areas of concern that you feel have not been considered, please provide additional comments below.

Comments:

Are there other Design Principles not included in the list that you feel should be considered as candidates for the final shortlist? If so, please provide your comments.

Comments:

The MOD believes that a DP should be included that captures the impact to other airspace users as none of the above DPs capture this. Given the potential volume of airspace that may be required by SHS and the number of airspace users who may be affected, impact on those other airspace users and their ability to operate should be considered. DP8 touches on this, but the rationale makes it clear that this is only in relation to the impact of change on low flying aircraft to local bird populations.

Furthermore, as an example, given the inclusion of DP10 with the proposal to potentially prohibit flight in some areas, the MOD believe it should be pertinent to understand and assess the impact on other airspace users' ability to conduct their activity.

The MOD suggest the addition of a DP "Minimise impact to other airspace users".

The MOD seek to minimise the impact of any new airspace required to enable operations from SHS on MOD activity, to enable the MOD continued ability to deliver defence operational and training requirements.