CAA CAP 1616 Options Appraisal Assessment (Phase I Initial)

Title of Airspace Change Proposal:	Spaceport 1 Scolpaig North Uist		
Change Sponsor:	QinetiQ Ltd		
ACP Project Ref Number:	ACP-2021-012		
Case study commencement date:	20/03/2023	**Case study report as at:**	09/05/2023

Account Manager: [redacted]	**Airspace Regulator (Engagement & Consultation):** [redacted]	**IFP:** [redacted]	**OGC:** [redacted]
Airspace Regulator (Technical): [redacted]	**Airspace Regulator (Environmental):** [redacted]	**Airspace Regulator (Economist):** [redacted]	**ATM (Inspector ATS Ops):** [redacted]

Instructions

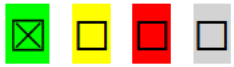
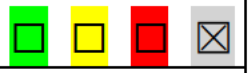
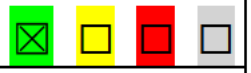
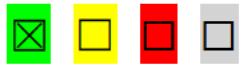
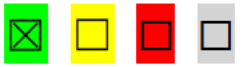
To aid the SARG project leader's efficient project management, please highlight the "status" cell for each question using one of the four colours to illustrate if it is:

Resolved - GREEN Not Resolved – AMBER Not Compliant – RED Not Applicable - GREY

Guidance

The broad principle of economic impact analysis is **proportionality**; is the level of analysis involved proportionate to the likely impact from that ACP There are three broad levels of economic analysis; qualitative discussion, quantified through metrics, and monetised in £ terms. The more significant the impact, the greater should be the effort by sponsors to quantify and monetise the impact.

1. Background – Identifying the impact of the options (including Do Nothing (DN) / Do Minimum (DM))			Status
1.1	**Are the outcomes of the Initial Options Appraisal (IOA) (Phase I) clearly outlined in the proposal?**		☒ ☐ ☐ ☐
1.1.1	Has the change sponsor completed an Initial Options Appraisal? [E12]	Yes, the Sponsor has provided a 196-page "Options Appraisal – Initial". Table 1 on pp. 23-37 is the summary of the Options Appraisal. It assesses Options 3-5, 1 and 2 having been rejected as inconsistent with various DPs.	☒ ☐ ☐ ☐
1.1.2	Does the Initial Options Appraisal include: - a comprehensive list of viable options; - a clear description of the baseline scenario; - an indication of the environmental impacts; - a high-level assessment of costs and benefit involved	There is no comprehensive list of the viable options in the IOA: a reader has to piece together the list from the text. Such a list, perhaps in table form would be helpful to clarify the structure of the IOA. A table with the list of options is now provided so this criterion is now met. Section 3.2 clearly describes the Baseline scenario which is the Do Nothing scenario. A reference to the fuller description of this Option in the DPE might help consultees to understand it more fully. The Do Nothing option is now described in section 3.2 of the IOA, so this criterion is now met. The environmental impacts are discussed and assessed in the Options Appraisal under Noise, Air Quality and Greenhouse Gas emissions. Table 4 (pp. 43-47) provides a high-level assessment of costs and benefits for each of the options assessed. The sponsor describes the current airspace users and	☒ ☐ ☐ ☐

		their activities in the vicinity of the spaceport which in total are expected to average 8 flights/day. The sponsor has also identified the NATS oceanic tracks potentially impacted by the airspace change and the consequential GHG emissions resulting from a longer rerouted trajectory. The sponsor has presented a rationale and supporting evidence in accordance with CAP1616 para B26 to scope out quantified environmental assessments for indirect impacts on noise, air quality, tranquillity, and biodiversity from consequentially rerouted air traffic below 7,000 ft. due to the low volume of traffic in the area. Environmental impacts (noise, air quality, climate change, landscape, and biodiversity) from direct space launch activities assessed as part of the EIA application are presented in the ACP submission which is considered acceptable at this stage.	
1.1.3	Has the sponsor stated on what criteria the comprehensive list of viable options has been assessed?	The IOA states in Section 3.3, that the list of viable options and the baseline options are assessed against "the high-level objectives and assessment criteria laid out in CAP1616, Appendix E, and Table E2".	
1.1.4	Where options have been discounted as part of the IOA exercise, does the change sponsor clearly set out why?	No options have been discounted as part of the IOA.	
1.1.5	Has the change sponsor indicated their preferred option(s) as a result of the IOA (Phase I - Initial)? [E12]	Yes, the Sponsor identifies its preferred option, Option 3, in Section 3.4 of the IOA.	
1.1.6	Does the IOA (Phase I - Initial) detail what evidence the change sponsor will collect, and how, to fill in any evidence gaps and how this will be used to develop the Options Appraisal (Phase II - Full)?	Yes, the Sponsor details this evidence in Section 3.6 of the IOA. The sponsor includes a certain number of metrics, including direct environmental impacts from the space launch activities that will be developed further in Stage 3 for the Full Options Appraisal, building on previous modelling work that was undertaken for the EIA.	
1.1.7	Does the plan for evidence gathering cover all reasonable impacts of the change? [E12]	There are no obvious gaps in the plan for evidence gathering.	

		The Sponsor has expanded in this area and now mentions WebTag.	

2. Impacts of the proposed airspace change					Status
2.1	**Are there direct impacts on the following:**				☒ ☐ ☐ ☐
2.1.1	*Examples of costs considered (please add costs that have been discussed, and any reasonable costs that the Airspace Regulator (Technical) feels have NOT been addressed)*				
2.1.2	Airport/ANSPs	Not applicable	Qualitative	Quantified	Monetised
	- Infrastructure	X			
	- Operation		X		
	- Deployment		X		
	- Other(s)	X			
2.1.3	Commercial Airlines/General Aviation	Not applicable	Qualitative	Quantified	Monetised
	- Training		X		
	- Economic impact from increased effective capacity	X			
	- Fuel burn		X		
	- Other(s)	X			
2.1.4	General Aviation	Not applicable	Qualitative	Quantified	Monetised
	- Access		X		
2.1.5	Military	Not applicable	Qualitative	Quantified	Monetised
		X			
2.1.6	Wider society, i.e., wider economic benefits, capacity resilience	Not applicable	Qualitative	Quantified	Monetised

	Greenhouse gas emissions		X		
	Capacity/resilience		X		
2.1.7	Other (provide details)	Not applicable	Qualitative	Quantified	Monetised
	Communities - Noise		X		
	Communities – Air quality		X		
2.2	**Are there direct beneficial impacts on air traffic control / management systems? Provide details.** N/A				☐ ☐ ☐ ☒
2.3	**Where impacts have been monetised, what is the overall value (expressed in net present value (NPV)) of the project?** N/A				
2.4	**Has the sponsor provided an accurate and proportionate assessment of the proposed airspace change impacts?** Yes the assessment of the major impacts seems proportionate and valid. There is no quantification of any of the impacts because "it is not considered proportionate" (p.8 of the IOA). Quantification is promised for "later stages".				☒ ☐ ☐ ☐

3. Changes in air traffic movements and projections				**Status**
3.1	**If the proposed airspace change has an impact on the following factors, have they been addressed in the proposal?**			☐ ☐ ☐ ☐
		Not applicable	Qualitative	Quantified/ Monetised
3.1.1	Number of aircraft movements	X		
3.1.2	Number of air passengers / cargo	X		
3.1.3	Type of aircraft movements (i.e., fleet mix)	X		
3.1.4	Distance travelled		X	
3.1.5	Operational complexities for users of airspace		X	
3.1.6	Flight time savings / Delays		X	

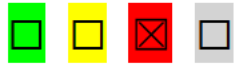
3.1.7	Other impacts	X		
	Comments: The qualitative assessment for the distance travelled and flight time savings are extremely brief. There is some economic forecasting, in particular of traffic numbers using Eurocontrol, in Section 3.7. The IOA argues that "It is extremely difficult to forecast the demand for the spaceport over the next ten years", then gives some estimates. While this is doubtless the case, it might be possible to get around this difficulty, for example through the use of scenarios.			
3.2	• Has the sponsor used the most up-to-date, credible and clearly referenced source of data to develop the 10 years traffic forecast and considered the available guidelines (i.e., the Green Book and TAG models) in a proportionate and accurate manner? [B11 and E11] The Sponsor has used Eurocontrol data to derive traffic forecasts. It does not feed these traffic forecasts into WebTAG. The sponsor states that there will be a maximum of 10 space launches per year: 2-3 launches (maximum of 4) in the summer months and 1 or fewer launches in wintertime. However, preparatory work for these launches will require additional 1-2 spare days and therefore the worst case assumes a maximum of 30 days where the required larger airspace structure will be activated, with 20 days being assumed as more realistic. The sponsor has provided a traffic forecast based on Eurocontrol's STATFOR October 2022 until 2028, extending it up to 2034 based on an annual increase in traffic of 2% (base scenario). The sponsor has also provided a quantified traffic survey of the current airspace usage by different users: Benbecula Airport (6 flights/day); Sollas beach landing strip (2 flights/month); HM Coastguard/Bristow (5 flights/month); military activity (2 flights/month); air ambulance and police (11 flights/month); fisheries (3 flights/month); Northern Lighthouse Board (2 flights/month) among others. In summary, the sponsor estimates approximately 212 flights per month in the vicinity of the spaceport. Section 3.5 now contains a more detailed description of the scenarios around number of launches, so this criterion is now met. • Has the sponsor explained the methodology adopted to reach its input and analysis results? [B11 and E11] The Sponsor explains the high-level methodology it has used in paragraph 3.1 of the IOA: "The chosen methodology is to conduct a simple qualitative assessment of the different options, both positive and negative, against the heading identified in CAP 1616…". However, this is not a detailed description of the quantitative analysis, since this is not yet provided, being promised for future stages of the process.			

	A more detailed description of the methodology used for traffic forecasts is contained in Section 3.7 of the IOA. The sponsor's GHG assessment based on several assumptions: 10 launches and 10 backup days (total 20 activations), proposed rerouting of 32 km and 16 km to the north and south of the activated airspace structure respectively, 10 litres of fuel consumption per km (A380/B777/A350 representative aircraft), impact on 2 NATS tracks with 132 flights, giving circa 520 tonnes fuel burn and 1654 tonnes CO2e emissions per year. The sponsor has referenced all the sources used for the traffic survey conducted (stakeholder engagement, CAA Statistics for traffic at Benbecula Airport, military AIP, Eurocontrol EUROSTAT Oct 2022, data collected during military exercises in D701 areas in May 2018, Official Aviation Guide website for fuel burn rates for representative aircraft, ASTM for density of fuel). The sponsor references the Spaceport 1 EIA Report for its assessment of noise, air quality, climate change and other impacts from the space launch activities. This report and its appendices are comprehensive and include clearly referenced sources of data with modelling carried out in line with best practice. It is to be noted however, that the planning application is still under consideration and therefore results presented in the EIA are considered to be unvalidated.	
3.3	**Has the sponsor developed an assessment of the following environmental aspects?** Direct impacts: the sponsor references the Spaceport 1 EIA Report to present the potential environmental impacts from space launch activities. The EIA report and its appendices include details on the sonic boom assessment and LAmax contours, overlaid on population centres and EU protected sites although NSAs have not been mapped. The emissions estimated from the forecast 10 launches are stated to be 14 tCO2e using worst-case propellants. The sponsor also includes an indicative worst-case AQ assessment to show concentration and dispersion of main pollutants after the launch. A number of other key metrics as required by SIA 2018 will be developed at Stage 3. Indirect impacts: the sponsor has scoped out the requirement for noise modelling on the basis of low concentration of air traffic in the vicinity of SP-1 that is supported by a traffic survey showing an average of 8 flights/day. Air quality, tranquillity and biodiversity have also been scoped out similarly. The sponsor acknowledges the impact on CAT in terms of additional track mileage to be flown due to rerouting around the activated airspace structure. Preliminary results indicate an increase of 1654 tonnes CO2e per year.	☒ ☐ ☐ ☐

		Not applicable	Qualitative	Quantified	Monetised
3.3.1	Noise			X	
3.3.2	Operational diagrams	X			

3.3.3	Overflight	X			
3.3.4	CO2 emissions			X	
3.3.5	Local air quality			X	
3.3.6	Tranquillity		X		
3.3.7	Biodiversity		X		
3.4	**What is the monetised impact (i.e., Net Present Value (NPV)) of 3.3? (Provide comments)** None provided.				

4. Economic Indicators of the ACP	**Status**
4.1	**What are the qualitative / strategic impacts described in the ACP?** **For the preferred option, Option 3, these are:** Air Quality: May be affected in the immediate vicinity of the launch site for a short period (a few seconds) during the actual launch; otherwise unaffected. Greenhouse Gas: Rocket engines will have a negative Greenhouse gas effect as will CAT flying extended track miles to route around the active elements of D701, in particular for long range rockets. Capacity/resilience: A large proportion of D701 areas being active at the same time as other adjacent airspace reservations may impact on NAT capacity – this risk is reduced through extant D701 protocols. Access: Impact likely to be negligible as GA levels are extremely low in this area. SOPs for the MOD Hebrides Range would apply to the fillet of airspace around SP-1 thereby enabling access to the active DA when safe to do so. Fuel burn: There is likely to be an increase in fuel burn on those occasions where CAT have to fly extended track miles around the active D701 areas – this will be mitigated through extant ASM processes and agreements affecting the timings when the areas can be activated. Airport/ANSP operational costs: Minimal other than the cost of capturing the small fillet of airspace around the launch site into the ATC training system and any additional training associated with the minor amendments to extant LoAs and SOPs. By using D701 in its current form means the costs to ANSPs remains at the lowest possible as ASM processes and procedures remain largely unchanged. Airport/ANSP deployment costs: Minimal other than the cost of introducing the small fillet of airspace around the launch site into the ATC and ASM systems and applying a new FBZ where appropriate. Other costs would include making minor amendments to extant LoAs and SOPs.
4.2	**What is the overall monetised and non-monetised (quantified) impact of the proposed airspace change?** No quantification provided at this stage.

4.3	**What is the Net Present Value of the proposed options? Has the sponsor used this information to progress/discount options? Has the sponsor provided the benefits-costs ratio (BCR) of the proposed options and used it to support the choice of the preferred options? [E44]** No NPV or BCR provided at this stage.	
4.3.1	**If the preferred option does not have the highest NPV or BCR, then has the sponsor justified the reasons to progress this option? [B50 and E23]** N/A	
4.4	**Have the sponsors provided reasonable justification for the proportionality of analysis above?** The Sponsor asserts that quantification is not proportionate at this stage. More explanation as to why this is the case would be helpful.	

5. Other aspects	
5.1	N/A.

6. Summary of the Initial Options Appraisal & Conclusions	
6.1	Overall, the Options Appraisal is comprehensive in most areas. However, to address the issues identified, the Sponsor may wish to: - provide a comprehensive list of viable options. - set out more justification for the lack of economic forecasting - consider using scenario analysis to forecast the uncertain level of demand for its services - use WebTag for its quantitative analysis - justify further the proportionality of the lack of quantitative analysis. The Sponsor has now addressed all these points satisfactorily and so meets the CAP 1616 requirements.

Outstanding issues		
Serial	Issue	Action required
1		

2		
3		
4		
5		

CAA Initial Options Appraisal Completed by	Name	Signature	Date
Airspace Regulator (Economist)	[redacted]	[redacted]	09/05/2023
Airspace Regulator (Environmental)	[redacted]	[redacted]	09/05/2023