



THE UK GOVERNMENT REVIEW OF POTENTIAL SPACEPLANE OPERATIONS AND CERTIFICATION IN IN THE UK

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Government request

- In August 2012, the Government tasked the Civil Aviation Authority to undertake a detailed review to better understand the operational requirements of the commercial spaceplane industry.



Review Objectives

- To assess the extent to which UK can support safe spaceplane operations.
- To develop options for the certification of spaceplanes, engines and associated systems.
- To identify key characteristics and potential locations of a spaceport.
- To develop an understanding of the future market for spaceplane operations.



Job Done

- Review was carried out in partnership with the UKSA and with the support of Industry
- A High level Summary document was presented to Government on 31st March 2014.
- The Detailed Technical report was formally presented at the Space Day Farnborough – 15th July 2014.
- Government announced a public consultation on the choice of potential spaceport locations – now complete.
- UK signed a Memorandum of Cooperation with FAA AST



Review documents:

- http://www.caa.co.uk/docs/33/CAP1198_spaceplane_certification_and_operations_summary.pdf



- http://www.caa.co.uk/docs/33/CAP1189_UK_Government_Review_of_commercial_spaceplane_certification_and_operations_technical_report.pdf

Regulation of Sub-Orbital Spaceplanes: UK Legal Considerations

- Sub-orbital spaceplanes are considered as ‘aircraft’ by the UK Government. Therefore EASA aviation legislation applies.....
But:
- Commercial sub-orbital spaceplanes are new, currently none in service, some are being tested and only likely to exist in relatively small numbers for the foreseeable future.
- Therefore UK Government currently considers spaceplanes as ‘Experimental’ and under the terms of the EASA Basic Regulation are Annex II aircraft and revert to National regulation.
- As a result spaceplanes can be regulated by the **CAA** under the articles of the UK Air Navigation Order (ANO)



Recommended Regulatory Framework: Sub-Orbital Spaceplanes

- The proposed framework would ‘ring fence’ Spaceplanes operations by:
 - using the CAA’s power to exempt from the Articles of the Air Navigation Order
 - Attaching conditions to the exemption, in particular to manage third party risk; and
 - Propose to use the concept of ‘**Informed Consent**’ to ensure passengers/participants understand and accept the risks of such operations.



Spaceplanes and Certification.

- A key contributor to safety is ensuring that, whenever a spaceplane is flown, it is 'airworthy' – in other words, it has been designed, manufactured and maintained to be fit for its intended purpose. In aviation, airworthiness assurance requires that the vehicle and those working on it meet specific standards, based on the lessons learned over many years of securing airworthy operations. As spaceplane operations develop, we would aim to adopt a similar approach.
- However, currently spaceplane operations are still in their infancy, and the standards of airworthiness for commercial aviation are not fully compatible with spaceplane technology. An alternative approach is needed: we recommend that it be based on direct systematic management of the safety of the spaceplane by those who operate it.



Spaceports

- The Review assessed the safety and operational requirements for a UK Spaceport.
 - In order to protect the uninvolved general public, and to comply with FAA AST safety requirements, a spaceport should be located in an area of low population density.
 - The UK has no deserts therefore a coastal site was seen as the most appropriate location for a UK Spaceport.
 - Easy access to segregated airspace – away from normal air traffic routes.
 - Following desktop review 8 locations in the UK were identified as potential locations for a Spaceport.
 - Following a public consultation this has now reduced to 6.



Phase2 : More to Do! Much MORE!

Our priorities set by Government

- The review assessed the likely timeline for spaceplane operations in the UK.
- The highest priority is seen to be recommendations as to:
 - The Regulatory framework for sub-orbital spaceplanes
 - The Regulatory framework and potential location for a UK Spaceport to support sub-orbital spaceplane operations.
 - Future long term certification options(with EASA) for spaceplane and rocket engines
 - Orbital launch safety regulation



Considerations

- **Short Term:**
 - Regulatory framework will seek to accommodate FAA AST licensed commercial sub-orbital spaceplane operations from a UK licensed Spaceport.
 - Will look to establish a UK licensed Spaceport that will be compliant with FAA AST requirements as far as possible.
 - Current plans will site Spaceport at a coastal location.
- **Long term**
 - Look to help establish a more formal European regulatory framework as experience is gained.



Way Forward

- Government has formed the Commercial Spaceflight Coordination Group (CSCG) to oversee delivery of the Review Recommendations.
- Reports to the National Spaceflight Board (3 Government Ministers)
- Development will be in line with Government priorities.
- UK CAA has set up a small full time team to carry out the regulatory development programme.
- Detailed legal and development work on regulations will need the support of all stakeholders.
- Estimate of at 4 years for this process.



Thank You – Questions?

