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Commercial Space Flight Safety and Emerging Issues (1)

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LAUNCHUK - POTENTIAL FOR PROFITABLE SPACEPORT OPERATIONS

Abstract

Nearly 50 years after Black Arrow launched Prospero into orbit from Woomera, Australia, the UK has decided to re-enter the space transportation industry, with a bold plan for commercial space launch services to operate from the United Kingdom mainland early in the 2020-2025 period. The focus of commercial services will be to deliver small satellites into orbit, and offer piloted suborbital flight experiments and personal spaceflight experiences with reusable vehicles. Primary (framework) legislation has already been passed through UK governing bodies, or Parliament, and a competition has been run to invite consortia of launch service providers and candidate spaceports to propose compelling commercial business models in exchange for UK government seed funding.

Both small satellite launch services using dedicated expendable small launchers, and reusable suborbital spaceplanes have not yet demonstrated sustainable markets, although global interest appears to be growing thanks to activity on several continents. Business models for spaceports focusing on these new classes of vehicles (compared to more traditional medium and large expendable rockets) are very dependant on market trends. Further, sufficient market capture must also be complemented by a number of subtle but important spaceport operations issues which strongly impact business model sustainability. In the UK these include favourable legislation which may mandate certain operations concepts (e.g. stage recovery) which are difficult to implement on small vehicles, transport logistics & storage of specific rocket propellants, insurance requirements, minimum safe distances, both on ground and during flight, and autonomous flight termination approaches. This paper will summarise a business model developed for a commercial spaceport serving small expendable launch vehicles, originally developed for the SCEPTRE project funded by the UK Space Agency, and since under refinement for a wider European context.