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A ROAD LESS TRAVELLED: A SPACEPORT'S PATH TOWARD A MULTI-USE LAUNCH COMPLEX

Abstract

With the number of new launch service providers expanding rapidly in the small- to medium-lift market, the capability of these companies to individually develop their own exclusive use launch complexes faces many challenges. A scarcity of available property on already-active spaceports, a dearth of financing for untested launch service entrants, and the lack of research and development (R&D) launch facilities all combine to make a new company's journey to market difficult. The need for a viable multi-use launch complex is demonstrated by the spaceport's investigation of the needs and requirements of a diverse customer set. The recent maturity of the launch industry should show the increased potential for multi-user facilities utilizing common standards, COTS equipment, etc. An airport-like operational approach to optimize use of limited launch site availability and capacity was identified as a practical method. Common use infrastructure, where items such as utilities and processing and control facilities are provided for any user, appears to be a concept of operations thereby allowing new launch service providers to instead focus their limited financing on launch vehicle development rather than in-ground infrastructure. The multi-use launch complex was studied under its initial intent to serve as an R&D launch site for an untested booster without the necessity for the launch service provider to invest large capital outlays for basic pad infrastructure. A comparison was drawn with aviation and airports, particularly the learned processes of new airline entrants and Low Cost Carriers models utilizing Multi-user gates and terminals to establish their routes and attract passengers. To assess the viability of a true multi-customer launch complex, the spaceport worked with many new entrants through a design charrette process to capture their collective pad requirements as a basis for design of a simple multi-user launch complex. This paper relates the launch complex design process utilized: from its beginnings with the investigation and preparation of the necessary environmental permitting documentation; analysis of both the optimum and maximum explosive site plans desired; and the scoping and design of the utility infrastructure needed to support a generic launch customer is explained. The example of the practicable utilization of Space Launch Complex 46 at Cape Canaveral Space Force Station for a diverse set of both solid- and liquid-propellant customers is presented.