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MARKET COMPETITIVENESS ANALYSIS FOR AIR LAUNCH SYSTEMS IN THE ASIA-PACIFIC SMALLSAT LAUNCH SECTOR

Abstract

Air launch (AirLaunch) systems combine an airplane mothership and a rocket payload, which is usually carried under the ship's wing or the underbelly. This configuration confers multiple advantages over conventional vertical launch systems and is suited for launches of small satellites up to a few hundred kilograms in weight.

AirLaunch systems were first considered for their cost competitiveness generated by combining an airplane first stage's efficiency in lower altitudes with denser atmospheres, and booster higher stages' efficiency in higher altitudes with less atmospheric friction. In the Asia-Pacific region, however, additional value can be gained by its spaceport-agnostic design, as AirLaunch systems using traditional commercial airplanes can be based out of traditional airports and do not require the construction of dedicated launch sites.

This study investigates the competitiveness of the AirLaunch design for the Asia-Pacific region, where the proximity of countries, often as direct neighbors, has limited the development of traditional vertical launch systems due to concerns about launch failure, debris from discarded stages, and airspace control. AirLaunch can provide services to countries with limited longitudinal airspace by launching rockets from locations with greater longitudinal control and less risks.

The study also investigates the business viability of the AirLaunch service operating out of a single regional hub to serve almost a dozen countries in the region. The well-developed maritime transportation network allows the customer country to ship satellite payloads into the hub country's port for direct flight and launch, with a broader selection of ascent routes and orbits. A modularized support system available for transport via container ships also allows for a hub-and-delivery business model of going into the customer nation's airport and providing the launch service within the country's airspace.

The study finds that the high concentration of countries in the Asia-Pacific region generates a competitive edge for AirLaunch systems over vertical launch systems, and is more attractive to national customers that cannot afford a dedicated launch site, or with limited access to sufficient longitudinal airspace for the conventional, Eastern, launch directions. The launch service is also more attractive for payloads with national security interests, where transit into other countries' waters or airspace may be undesirable. The

study concludes that AirLaunch can be a strong contender for SmallSat launch services in the Asia-Pacific region as a scalable solution provider in a fast-growing launch services provider market.