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LAUNCHER ENGINE TECHNOLOGY PLATFORMS AS AN ENABLER FOR FUTURE SUSTAINABLE AVIATION

Abstract

The launcher industry has since the beginning of space exploration spearheaded technology development applicable for the several times larger aerospace and aviation business. The necessity to invent new design and manufacturing solutions that can realize products for the extreme operating conditions and requirements of a launcher engine, has been a driving force which has challenged traditional ways of working and pushed technology development forward.

The space and launcher industry has now entered into a new era, where an exponentially increasing demand for orbital launches has accelerated the development of new launchers and attracted new actors to the business. A similar technology acceleration is in parallel being observed in the aerospace sector. The public demand for a more sustainable aviation is pushing the industry to accelerate technology development of lighter and more fuel efficient engine solutions in order to ensure future market competitiveness. The introduction of new design and manufacturing solutions will be the key enabler to success.

GKN Aerospace Engines is a commercial actor designing and manufacturing subsystem and components to both the aircraft engine business and the launcher engine business. From this position, GKN concludes that the technology synergies between these two market segments rapidly has increased which creates a foundation for a more cost and lead time effective technology development. The evolution of these two sectors has also a great potential to take advantage of each other's existing knowledge. For example, the long term experience of maintenance, overhaul and life tracking systems in the aircraft engine industry has potential to benefit efficient development of reusable launcher applications. Similarly, the experience from design and operation of hydrogen fuelled launcher engines, has potential to benefit the hydrogen initiatives in the aircraft engine business. The launcher engine development also provides an opportunity to benchmark, develop and verify by engine testing technology that provides great potential for the commercial aircraft engines, and industrialize in lower volumes to verify long-term robustness.

This paper describes the increasing synergies between the two market segments and how an evolution of the existing industrial structure can generate a building-block that benefit both businesses. It summarizes how GKN expects the launcher engine sector to be the spearhead for introduction of new aerospace technologies, particularly for additive manufacturing processes, and how that experience, learnings, and standards will be a trailblazer for later introduction in the aircraft engine business, which will follow directly after and further push aviation towards sustainability.