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Generic Technologies for Small/Micro Platforms (6A)

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THE PATH TO THE FIRST FLIGHT OF THE NEXT GENERATION MICROSATELLITE
PLATFORM: DELIVERING SMALLSAT PERFORMANCE FOR A CUBESAT COST

Abstract

KISPE Space is developing the Next-Generation Microsatellite Platform (NGMP): a generic, flexible, low-cost small satellite platform that can be used to enable a wide range of missions, applications and services in the 25kg-250kg mass range, in response to the combined technical and business challenges of our customers. The NGMP has been designed to satisfy the needs of mission developers and service providers for an accessible and cost-effective platform solution which allows them to close their business cases, secure investment and develop a sustainable service offering, whether flying a single satellite or multiple spacecraft, a constellation. The starting-point for this brand-new, clean-sheet, spacecraft design was the need to deliver an order of magnitude improvement in price-performance. This is being achieved by adopting a holistic philosophy: eliminating as much “touch time” as possible, digitising the design, adopting a “design for manufacture, test and operations” mindset from the outset, and building in robustness and high-performance capability into the baseline design. This paper:

- Examines the status and capabilities of existing cubesat, smallsat and “constellationsat” systems and describes the gap in the market which is not being addressed by these systems
- Discusses the NGMP target performance specifications: mass 25kg to 250kg; >70
- Provides insights into the Concept of Operations scenarios that were generated and against which the NGMP design was evaluated, to ensure that it fulfils the requirement for a generic, performant platform capability and flexible mission-enabler
- Describes the NGMP project milestones and progress made to date, including the results of the research undertaken to test and downselect terrestrial microprocessors and other devices to include in the platform and mission design
- Presents the spacecraft architecture, the philosophy for the delineation of platform and payload functionality and the impact this has on reducing Non-Recurring Engineering
- Describes the approach to developing the NGMP to be “Satellite 4.0”: integrating Industry 4.0 developments that allow project timelines and costs to be reduced and accelerate launch readiness and revenue generation.