SPACE SYSTEMS SYMPOSIUM (D1)
System Engineering - Methods, Processes and Tools (1) (3)

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FRENCH INITIATIVES FOR THE IMPROVEMENT OF SPACE MISSIONS DEVELOPMENT

Abstract

Since 2006 CNES, in partnership with the two Frenchsatellite manufacturers Airbus Defense Space and Thales Alenia Space, works on the improvement of space mission development. The goal was to increase the common parts between projects to gain in productivity and inter-operability and to ease adoption of standards such as the ECSS within industry.

The first initiative, called ISIS for Initiative for Space Innovative Standards, was dedicated to define a normative framework improving housekeeping space services interoperability and reuse. This led to produce a set of system - satellite engineering requirements and ground-to-space interfaces and operability requirements. This work involved the three partners in order to maximize synergies with the internal processes, best practices and current product lines design. CNES is now supporting the convergence of industrial platform product lines (mainly their avionic cores) toward ISIS through institutional programs as the new scientific space missions MERLIN (CNES/DLR) and SWOT (CNES/NASA). In addition, CNES is developing a ground control segment product line capable of operating any satellite based on ISIS specifications.

The second initiative, called Myriade Evolutions, was to develop a new platform, compliant with the ISIS standard, to extend current industrial product lines offers to the "350-400kg satellite class". On top of ISIS requirements, the three partners agreed to commonly define and develop the units fitting this class of performance and compatible to their respective avionic cores. This result in the production of 10 new units or sub-assembly: a platform structure, a propulsion module, a solar array, a battery, a power conditioning system, a mass memory, a reaction wheels, a S-band transceiver, a X band transmitter and a GNSS receiver.

Thanks to these two initiatives, Airbus Defense Space, Thales Alenia Space and CNES will be able to produce satellite platforms and space missions at avery attractive development and operational cost. MERLIN is the first scientific mission based on the Myriade Evolutions platform planned to be integrated and tested in early 2017. Other governmental or commercial projects already implement some of the common Myriade Evolutions units.

The proposed paper will introduce in details the ISIS and Myriade Evolutions initiatives (origin, rational and product lines) and how they are implemented through the first scheduled missions as MERLIN and SWOT, providing a first feedback on the ISIS implementation.