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ALSAT-NANO: KNOWLEDGE TRANSFER TO OPERATIONS PARTNERSHIP

Abstract

In 2014, the UK Space Agency (UKSA) and the Algerian Space Agency (ASAL) agreed a Memorandum of Understanding to strengthen collaboration between the two countries and to carry out a Joint Space Programme of training underpinned by the cooperative development and execution of small satellite mission, AlSat-Nano. The UK programme is being delivered by the Surrey Space Centre of the University of Surrey, funded and steered by UKSA. The programme involves a number of Algerian graduate students hosted at the Surrey Space Centre and focused on the development and operation of a Nanosatellite as a

hands-on learning exercise for the students and ASAL staff, to demonstrate the practical implementation of this type of low cost space technology. Graduate students are enrolled on courses related to key areas of satellite technology. Additional focused training programmes were delivered to ASAL staff in the areas of AIT, environmental testing and spacecraft operations. Preparation for mission operations involved the definition, implementation and testing of a full nanosatellite groundstation at the ASAL CDS facility.

To increase the value of the mission and widen the reach of the programme, it was decided that the AlSat-1N Nanosatellite would carry self-funded payloads supplied by the UK CubeSat community, and selected through a competitive process, effectively performing a technology demonstration mission. The three payloads demonstrate novel technologies in mechanisms, imagery and power generation. These payloads occupy approximately half of the spacecraft volume. The AlSat-1N spacecraft was designed, integrated and tested by University of Surrey with hands-on participation by ASAL students. The AlSat-1N spacecraft went from design to delivery in 18 months. The satellite was launched in September 2016, with key mission success criteria delivered in early 2017. The mission is currently in the full operations phase and continues to return new results from the payloads. As a result of the training programme, true joint operations have been achieved utilising both the SSC and ASAL groundstation facilities.

The AlSat-Nano programme pursues education, research and specific applications of space technologies that offer the potential for cost effective solutions to help Algeria with some of the developmental challenges that the country is facing, ranging from help with effective management of land resources, to pollution monitoring and telecommunications.

This paper illustrates the development of the programme, the engineering of the satellite and the development of collaborative operations between SSC and ASAL.