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BUILDING COMPREHENSIVE THAILAND SPACE CAPACITY THROUGH THEOS-2 SMALLSAT

Abstract

THEOS-2 SmallSAT is not a typical Earth observation satellite. It is a program that involves innovative technology transfer, payload designed and built by Thai engineers, and local manufacturing capacity building, including using for the first time a small satellite testing facility in Thailand. This 100-kg class satellite is currently being developed at Surrey Satellite Technology Ltd (SSTL), United Kingdom with a team of 22 Thai engineers involved in every process from design, analysis, development, manufacturing, integration, and test. This includes Thai engineer's hands-on payload, which is based on Raspberry Pi and incorporates their newly designed sun sensor.

To achieve sustainability in the future, manufacturing technology is being transferred to the Thai local suppliers, which will be part of a supply chain for the future satellite builds in Thailand. In the first phase, a handful of mechanical parts produced in Thailand has been selected as flight hardware and installed already with the spacecraft. To expand capacity building beyond the 22 Thai engineers, a similar number of engineers will join additionally in the second phase of technology transfer. They will re-build Thai designed payload using local Thai supplier only. This intends to prove the end-to-end domestic capacity to develop a fully functional payloads.

Throughout the two years in the UK, Thai engineers have been working through many technical challenges and difficulties with the technology transfer partner's support and guidance. Despite the limited schedule and global virus pandemic, the THEOS-2 SmallSAT team have been able to progress as planned, achieve beyond expected objectives without cost overrun and fulfilled satellite development knowledge. The paper will summarize all lessons learnt from the technology transfer using small satellite, with a particular focus on mobilizing local industry back home.