

## IAF SPACE SYSTEMS SYMPOSIUM (D1)

Lessons Learned in Space Systems: Achievements, Challenges, Best Practices, Standards. (5)

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## MISSION ASSURANCE HANDBOOK FOR UNIVERSITY-BASED LEAN SATELLITES

**Abstract**

A lean satellite is a satellite that utilizes non-traditional, risk-taking development and management approaches – with the aim to provide the value to the customer and/or stakeholders at low-cost and without taking much time to realize the satellite mission. It is another name to express the nature of pico/nano/micro/small satellites. It is well known that the mission success rate of university-based lean satellites is much lower than those of traditional satellites or non-university-based lean satellites. Utilizing the idle time during the pandemic in 2020, UNISEC (UNiversity Space Engineering Consortium) of Japan organized a series of online meetings to exchange the lessons learned from university satellite projects. JAXA later funded a further study to do survey on the lessons learned among the university projects and analyse the success and failure cases and extract the requirements for the mission assurance. Further analysis of the failure cases to extract their root causes led to making a handbook for mission assurance. The handbook gives summary of points to be kept in mind by faculty members and students to improve the mission success rate. Although the handbook is targeted satellite projects at universities and polytechnic-colleges, some of the contents also apply to lean satellite projects at new space companies. It is organized in the order of project life-cycle, i.e. from the mission definition to the operation with three additional chapters on project management, post-operation and sustainability of university satellite program. As of February 2022, the final draft made of approximately 50 pages are ready for publication later in 2022. Although the handbook is based on the lessons learned of Japanese universities, many of those apply to other countries as well. Therefore, English version will be published along with the Japanese version. In this presentation, the content of the handbook will be presented.