

IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
Interactive Presentations - IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (IP)

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ESA ACADEMY'S CUBESAT PROGRAMME: LESSONS LEARNED DURING THE 'FLY YOUR
SATELLITE!' CRITICAL DESIGN REVIEWS

Abstract

'Fly Your Satellite!' (FYS) is a recurring hands-on programme managed by the ESA Education Office as part of the ESA Academy. The programme was established to support university student teams in the development of their own CubeSat by enabling a transfer of knowledge and experience from ESA specialists to the students. Selected teams are guided through project reviews and verification campaigns, conducted according to ESA professional practice and standards tailored to fit the scope of university CubeSat projects.

In May 2017, six CubeSat teams were accepted to participate in the second edition of 'Fly Your Satellite!'. This edition of the programme is structured in five phases: Design, Build, Test, Launch and Operate Your Satellite. As part of the design phase, student teams prepared the data package containing detailed information on their CubeSats' design, project management, and the assembly integration and verification plan. A panel of ESA specialists, covering up to 15 disciplines of the space domain, reviewed the data packages and agreed with the teams on a set of clarifications to be prepared and corrective actions to be undertaken by each team to improve their spacecraft design, in order to achieve the objectives of the Critical Design Review.

During this process, a number of issues were identified and were recognised to be common amongst several teams, and in our understanding this underlines the importance to create and disseminate the outputs of the reviews which may have value of lessons learned. Similarly, a need to establish common good practices was observed in order to facilitate the work of the reviewers and to make the students acquainted with the relevant ESA standards. The conclusions have been collected and are the baseline of this paper.

The lessons learned have been categorised into different areas including 'design', 'preparation for testing', 'space project management' and 'educational value'. The paper brings up to the attention of student CubeSat teams a few aspects to be considered during the design phase of their projects (Phases 0-C). Considering in due time the proposed lessons learned may help to increase the good confidence in the suitability of the verification approach, and, consequently it can be beneficial to improve the chances of mission success.