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PW-SAT2 SATELLITE LESSONS LEARNED

Abstract

PW-Sat2 is the project held by Warsaw University of Technology in Students' Space Association at Faculty of Power and Aeronautical Engineering. The project had started in Q1 2013, one year after the launch of the first Polish satellite PW-Sat. As a continuation of the space debris mitigation subject, the second satellite main payload is a deorbit sail fully designed and developed by students. Several additional payloads had been proposed and chosen as a secondary mission goals. The satellite had been successfully launched on board of Falcon 9 at SSO-A mission on 3rd December 2018. The satellite completed its mission by testing all primary and secondary payloads. Deorbit sail deployment was executed on 29th December. On-board cameras sent dozens of valuable images confirming the full deployment. Four days after sail deployment the team noticed some damages on the sail material. The investigation showed some probable scenarios. Nevertheless PW-Sat2 stays still operational while decreasing its orbit. During 6 years of the project the team has been evolving in the mean of project organization, management, development methods and experience. More than 100 members have been involved in the project in total. The team tried to tailor and apply ECSS project phasing standards, since the project was financed through ESA. Various technics and applications for the project management had been tested in order to find the best solution. The development of the technical solutions and trade-offs made from the beginning of the project to the integrated satellite gives a very clear lessons learnt and recommendations for the future missions

of similar scale. Several critical situations during the project development made it close to be aborted, both technical, financial and organizational. Fortunately it only influenced the project duration and bring the worthful experience. The economic situation in the country, namely the full membership of ESA in 2012, initiated the space industry growth. This situation bring a number of partners and sponsors to the project. Part of the companies were focused on gaining the experience required to start the space activity. Partners from non-space industry joined the project bringing their experience in commercial software development in on-board software development and testing methods.