

SMALL SATELLITE MISSIONS SYMPOSIUM (B4)
Small Satellite Operations (3)

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POST MISSION LIFE PLAN FOR FORMOSAT-2

Abstract

The purposes of this paper are three folds: To present the enhancement in mission operations of FORMOSAT-2 (Formosa satellite 2) during its mission life of five years from 20 May 2004 to 20 May 2009, To present the trending analysis of the state-of-health (SOH) of FORMOSAT-2 during its mission life, and To present the mission plan of FORMOSAT-2 after its mission life. There are two payloads onboard the FORMOSAT-2: a remote sensing instrument (RSI) with nadir ground sampling distance (GSD) of 2 m for panchromatic (PAN) and GSD of 8 m for multi-spectral (MS, 4 bands) as the primary payload, and an imager for sprite and upper atmospheric lightning (ISUAL) as the secondary payload. It was launched on 20 May 2004. The design life is 7 years while the mission life is 5 years. In other words, the end of mission life date of the FORMOSAT-2 is 20 May 2009. There are many times of technical enhancement in its mission operations during the 5 years mission life. In particular, the standard operation procedure (SOP) for urgent imaging has been established. As to its health, FORMOSAT-2 is still at very good condition in its SOH. Among the four gyros (one of them is redundant) within the onboard inertial reference unit (IRU), one had been failed. It means that there is no more redundancy for the gyros. However, the three gyros remain operating are still in good condition. The battery of the FORMOSAT-2 has some degradation for several percent. This degradation is within and below design prediction. There are also degradations in the charged couple device (CCD) of the FORMOSAT-2's RSI. We analyze all subsystems including the two payloads. Then we conclude the possible extension of the FORMOSAT-2's real working life in orbit. Since FORMOSAT-2's SOH is still very good, an extended mission operation plan after its 5 years mission life has been made. There is still 50 kg propellant onboard. The plan consists of several aspects: orbit transfer in altitude, orbit transfer in RAAN, better image resolution, etc.