

On-orbit Thermal Behavior of KOMPSAT Liquid-Monopropellant Hydrazine(N_2H_4) Propulsion System

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On-orbit thermal behavior of KOMPSAT (Korea Multi-purpose Satellite) propulsion system employing hydrazine (N_2H_4) liquid monopropellant is addressed. Thermal control performance to prevent propellant freezing in spacecraft-operational orbit was verified by flight telemetry data obtained during LEOP (Launch and Early Operation Phase). Results are depicted in terms of temperature history during several orbits selected and are compared with acceptable temperature ranges of system components. Cyclic behavior of temperature is reduced into duty cycles of the avionics heaters and subsequently converted into the electrical power required to keep away from propellant freezing. Temperature of each component which was achieved under on-ground thermal-balanced condition of spacecraft, is presented for comparison with the flight data, additionally.