Paper ID: 30219
oral

66th International Astronautical Congress 2015

SPACE PROPULSION SYMPOSIUM (C4)
Propulsion Technology (1) (3)

Author: Mr. Michael Zaberchik
Rafael Advanced Defense Systems Ltd., Israel, michaelz@rafael.co.il

RAFAEL PASSIVATION VALVE FOR SATELLITES PROPULSION SYSTEM

Abstract

The International Telecommunications Union (ITU) and the United Nations (UN) are trying to regulate the Space industry to implement a Passivation stage at the End of Life (EOL) of the Spacecrafts. At the EOL, the Spacecraft need to move to a disposal orbit and deplete all energy sources from the Spacecraft. At the EOL, GEO satellites need to change orbit to disposal orbit, 350 kilometers above the GEO belt. At that location, the satellite needs to release the stored energies, the Passivation stage. Rafael proposes a Passivation Valve (PV) that shall be part of the Propulsion System (PS) and will be used to release the remaining pressure of the Propulsion System (PS). The PV comprises a two single seat Normally Closed (NC) solenoid valves connected in series as an integrated unit. The PV inlet cover contains 4 holes to direct the exhaust gas in opposite directions to prevent thrust when depleting the left over gases. The PV is all welded and provide a leakage rate that is better than 1x10-6 SccHe/sec. The proposed PV is used as a Fill and Vent Valve (FVV) that can be used to load pressurant gas and perform system pneumatic tests. This additional capability/functionality of the PV makes it a proper replacement for existing FVVs and save a designated Half Ground Valve.