

SPACE PROPULSION SYMPOSIUM (C4)
Electric Propulsion (4)

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ELECTRIC PROPULSION ACTIVITIES IN AIRBUS DS 2016

Abstract

Major players worldwide are targeting in their current programs full electric satellites for station keeping and orbit raising. Three major electric propulsion technologies are competing each other, Hall Effect Thruster, Gridded Ion technology (including Kaufmann and Radio Frequency technologies) and High Efficiency Multistage Plasma. The main parameters used to trade-off these technologies are thrust/power ratio and ISP. Currently the market is mainly thrust driven, and therefore the dominant technology is HET. But electric propulsion business case is driven by current technologies and operators mindset. Several questions with difficult answer can be raised about the future trends for EP. Would the major operators accept OR transfer period above 5 months? How launcher direct injection would impact on the current technologies? Airbus DS Space Equipment believes the future will most likely not be based on just one single technology. Therefore PPU solutions for all technologies (HET, GIE and HEMP) are needed to answer the mid/long term market needs. In this sense Airbus DS Space Equipment supported by the National Agencies (DLR and CDTI) and the European Space Agencies is evolving their current PPU products for high voltage technologies (PPU HV) and developing new HET PPU solution (PPU NG). PPU NG product is a joint development between Airbus DS Elancourt (France) and Airbus DS Crisa (Spain). It is flexible and modular equipment, capable to adapt to a wide range of EP subsystem configurations and compatible to the main HET thrusters in the market. Recently, EM PPU coupling test has been successfully accomplished. PPU HV for high voltage applications (for GIE HEMP) product is a joint development between Airbus DS Germany and Airbus DS Crisa (Spain) currently under development (based on best practices from the successfully qualified HEMP PSCU and in qualification BEPIC PPU). The main principle is the development of generic building blocks to easily customize the PPU to any EP thruster independently of its technology. The maximum communalization will significantly reduce the development efforts, but also the recurrent efforts by applying new technologies and innovative solutions. The core element is the generic High Voltage Module, which is designed to be customized to specific thruster needs by exchanging a submodule without need for a delta-qualification. This modular approach provides the necessary flexibility and maximum of recurring elements. Airbus DS managed to harmonize these products based on the generic High Voltage Power Supply (HVPS) highly supported by the German Agency (DLR).