

66th International Astronautical Congress 2015

SPACE SYSTEMS SYMPOSIUM (D1)
Interactive Presentations (IP)Author: Dr. Otavio Luiz Bogossian
Brazilian National Institute for Space Research - INPE, Brazil, otavio.bogossian@inpe.br

PLATFORM ROBUSTNESS FOR UNKNOWN SPACE MISSIONS

Abstract

This paper aims to propose system architecting principles to assess and guide the conceptual design of platform-based solutions for satellite space applications. The most adopted multi-mission platform development process is based on defining a first mission and a set of weakly defined future reference missions. The platform shall be capable to comply with the environment, payloads and launchers requirements of these missions. This work, based on the Design for Changeability (DfC) previous work, proposes Aspects and Principles to be considered during the design to increase the platform robustness for unknown missions. Aspects considered as applicable to space missions are robustness to the environment, robustness to support multiple payloads and flexibility/agility to be modified. Principles (Aspects enablers) considered applicable are independence, modularity/encapsulation, scalability, integrability and decentralization. As a conclusion the Aspects and Principles proposed are the building blocks of a future method that will provide qualitative and quantitative evaluation of how well the platform design is robust to support different missions with reduced impact in terms of modifications.