Highlight on engineering process for satellite operations: phases, procedures, tools and training concepts – IAA-LA-03-01

Authors: Axel D. Dente* and Eduardo Danizio,
INVAP S.E
*adente@invap.com.ar

ABSTRACT

In satellite missions design, one of the main components, beyond satellite manufacturing itself, is the definition of satellite operations. This definition is associated to the orbit selection and the level automatism defined for the satellite. For example in GEO satellites the full-time contact with the satellite allows reducing the automatic sequence that shall be included onboard. However in a LEO satellite, the reduced visibility imposes that almost all operations must be executed by automatic processes or by time-tagged commands.

This kind of constrains impacts directly on the ground station requirements, the satellite design and also the operation design. In the last case it is convenient to base the operation process on standards, but performing a specific tailoring to the particularities of the mission and the available resources.

In this paper we present our experience in the engineering process for reaching the satellite operations, starting from the Preliminary Operation Review to the LEOP and “In Orbit Test” campaigns. For every phase we will expose the key factors that were taken into account to reach satellite operations. Among these factors, one of the main components is the procedure generation. To perform this activity, the operation engineers shall develop the procedures by using under-evolution documentation and tools. This complex scenario imposes that operation engineers shall work closely with the sub-system specialist for learning the detailed functional behavior and also the design constraints.

In addition to the technical issues we will show the aspects related to the training of the operation engineers for the satellite objectives, and particularly we will present the advantages, based in our experience, of involving the Operations Engineer Team in the design, testing and execution of AIT procedures.