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ACTIVITIES (D5)

Quality and safety, a challenge for traditional and new space (1)

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IMPLEMENTATION OF SPACE SYSTEMS SAFETY REQUIREMENTS DURING THE AMAZONIA-1
AND CBERS-04A SATELLITES PROJECT PHASES

Abstract

The space area can be divided into several branches, from theoretical and applied scientific research, as well as technological development activities with a bias towards the manufacture of space artifacts such as satellites and rockets. In space projects, system safety is part of the body of disciplines that must be studied thoroughly throughout the life cycle of the space artifact project. In Brazilian satellite projects, the Space Systems Safety discipline was formally instituted at INPE (National Institute for Space Research) in 2016, with the creation of the Space Systems Safety Assurance Group (GSSE), which has in its scope of activities: to coordinate, organize and control the safety activities of space systems of their products in space programs and projects, as well as establish safety policies and requirements and evaluate their effective implementation. It is also part of the scope of the GSSE's activities to evaluate the effective implementation of the management process in all areas of design, development, manufacturing, integration, testing, operation and maintenance of space systems. This paper presents two case studies, describing how the safety requirements for INPE's space projects were elicited and describing how some of these requirements were implemented. The first case study presents the use of a hazard analysis tool for the operation of one of the mechanical ground support equipment of the Amazonia-1 satellite, using requirements that was defined for the development phase of a space product. The second case study presents the results of safety inspections carried out at the INPE's space test center prior to beginning of the CBERS 04A (China Brazil Earth Resources Satellite) test campaign, in order to verify if its infrastructure was able to ensure the safety of the people involved, the flight hardware to be tested and the testing facilities.