45th SYMPOSIUM ON SAFETY AND QUALITY IN SPACE ACTIVITIES (D5)
Insuring Quality and Safety in a Cost Constrained Environment: Which Trade-Off? (1)

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WAYS OF COMPLIANCE WITH SAFETY AND DEBRIS MITIGATION REGULATIONS: TECHNICAL AND COST APECTS

Abstract

Apply the key principles of the international agreements about space operations requires national legal and regulatory mechanisms . Aware of his responsibilities the French state has enacted the Space Operation Act, which stipulates that the prime objective of the National technical regulations is to protect people, public health and the environment. Compliance with these technical regulations is mandatory as of 10 December 2010 for French space operations. Of course, safety requirements applied to obtain authorizations are based on national and international best practices and experience. On one hand, the critical design review of the space system and procedures shall be carried out by the applicant in order to verify the compliance with Technical Regulations. On the other hand, the independent technical assessment of the operation is delegated to CNES which refers to Space Minister in order to publish the final authorization. Going into more details, the main topics addressed by the technical regulations are: safety management system, study of risks to people, public health and the Earth's environment; impact study on the outer space environment. The principles applied when drafting technical regulations are as follows: requirements must as far as possible establish the rules according to the objective to be obtained, requirements must give preference to international standards recognised as being the state of the art; requirements must take previous experience into account. But it is also important to be careful about costs linked with technical regulations application. Regulations should not be taken as specific constraints generating new costs but a commercial advantage of safe behaviour. In order to achieve an objective of identifying reliable and cost effective ways of compliance with technical regulations requirements, CNES has initiated for many years a program dedicated to identify safety and debris mitigation best practises . Today, three methods and tools developed in the frame of this program are already qualified and operational, and for some of them accessible to all operators. - ELECTRA, to evaluate the risks involved in launch and re-entry of a spacecraft. - STELA to ensure appropriate disposal orbit of space object outside the protected regions (low earth or geostationary orbit) - ACRL for Risk Analysis of collision with a manned vehicle during launch operation The purpose of this article is to review the methods and models chosen by CNES and lessons learned during the first using year of these tools, with respect to technical, management and cost aspects.