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SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)
Launch Vehicles in Service or in Development (1)

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COMPLEX PROBLEM OF SYSTEM DESIGNING OF SPACE ROCKET SYSTEMS WITHIN THE INTERNATIONAL COOPERATION

Abstract

In conditions of low-level budgetary funding in Ukraine, upgrading of space rocket systems (SRS) within the international cooperation became the best way of creation of space rocketry (SR) objects that enables to cut costs of each party, on the one hand, and on the other hand to integrate the advanced technologies of the parties for creation of the system with higher characteristics. The basic requirements, which have an influence on formation of a technical layout of the space rocket system to be built within the international cooperation, are as follows: need in ensuring the competitive edge of SRS in the launch services market; development of SRS with a family of modular launch vehicles (LV) to ensure wide field for their commercial application; possibility of SRS creation in different climatic zones using the infrastructure of the existing launch sites. The report reviewed a system approach to ensuring the competitive edge by the example of the Antares SRS, first, due to safety control during LV launch and flight, a high level of reliability, cost cutting in development, production and operation because of the application of the earlier proven engineering solutions. The risk control procedures are provided for safety ensuring in development and operation of SR products. The risk control process is continuous and performed in all phases of SRS creation. A level of SR development currently allows, without special expenditures of facilities and time consumption for design and pilot works, to conduct the conceptual design of new SRS for the foreign customers, considering the earlier adopted engineering solutions to the maximum. Planning of experimental development test requires optimization of quantity of hardware for testing based on saving of financial expenditures, with simultaneous compliance with the specified operational characteristics of the rocket system. Creation of SRS in new climatic zones (at different world launch sites) is realized by a scientific-methodical approach to formation of the environmental models as well as factors of new types of launch vehicle transportation (sea, air) to the worksite.