44th SYMPOSIUM ON SAFETY AND QUALITY IN SPACE ACTIVITIES (D5)
A Big Challenge : Safety in Aerospace Missions (1)

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THE AUTHENTIC RELIABILITY OF A COMPLEX TECHNICAL SYSTEM CAN BE ONLY A POSTERIOR AND NO OTHER (THE TASKS OF ENSURING HIGH RELIABILITY OF GROUND LAUNCH COMPLEX OF SPACE SYSTEM)

Abstract

THE AUTHENTIC RELIABILITY OF A COMPLEX TECHNICAL SYSTEM CAN BE ONLY A POSTERIOR AND NO OTHER (The tasks of ensuring high reliability of ground launch complex of space system) Dr. Vadim Kadzhaev. Russia. Moscow.TsENKI. kava.kbom@gmail.com Abstract The foregoing title follows from the well-known statement that the methodological toolkit and the operative practice of design for reliability are based on the Theory of stochastic events and the Theory of probability. The tasks of ensuring the reliable operation of ground launch complex of space system are also considered from this perspective, and special attention is paid to the selection of random processes (which determine methodological approaches to tasks) and the corresponding laws of random event distribution. The first step of problem solution is performed traditionally: the basic (or prior) reliability was pawned at designing of system and subsequently confirmed by Bernoulli trials in the framework of stationary Poisson flow, resulting in Binomial and Geometrical laws of random event distribution. Analytical expression of the latter ones lets one to find its quantitative values and those may be accepted as a standart for simhle system. However, this is not enough for complex systems, hence the next step of solution follows. The task of the second step is to evaluate probability of a desired significant outcome (e.g. normal system operation) that belongs to the full group of incompatible events. The computation is performed according to full probability- and Byes' formulas, taking into account conditional probabilities of a positive hypothesis. In this case the posterior probability indicator significantly increases in comparison with the prior reliability indicator. Preliminary evaluation of conditional hypothesis probabilities is performed during final functional system tests, which done in the framework of random Markov process at the end of pre-launch preparations. (These tests should not be confused with Bernoulli trials performed earlier). A detailed description of aforementioned tasks of methodological and operational support for reliability ensuring will be presented in the article.