

51st IAA SYMPOSIUM ON SAFETY, QUALITY AND KNOWLEDGE MANAGEMENT IN SPACE
ACTIVITIES (D5)

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

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A CONCEPT FOR SYSTEM INTEGRATION OF GROUND BASED SPACE INFRASTRUCTURE OF
COSMODROME IN ORDER TO PROVIDE QUALITY AND SAFETY AT ROCKET LAUNCH**Abstract**

Cosmodrome is a territory engineering and topo-geodesical equipped, with all the facilities, communications, support teams and required means which provide storage, maintenance in specified readiness, preparation for launch, launch and flight control at injection trajectory of the integrated launch vehicles (ILV).

The article is focused on developing of integrated concept for cosmodrome ground based space infrastructure (GBSI) system integration on the basis of:

- requirements for space rocket complexes (SRC) being parts of cosmodrome;
- preliminary design of ILV envisaged to be implemented at cosmodrome;
- requirements for individual facilities and means of cosmodrome GBSI taking into account their quality and safety indicators.

In order to solve a problem of GBSI system integration there applied scientific methodological approaches, such as: system approach; theory of hierarchical multi-level systems; theory of goal-oriented processes efficiency.

Cosmodrome GBSI structure comprises 3 groups of facilities and means:

- SRC intended process facilities. Their main task is obtaining of a target intended result for cosmodrome;
- cosmodrome process support environment. Its main task is counteracting of unfavorable factors impact which prevent the required intended result for cosmodrome;
- another support infrastructure (transport, engineering networks, etc.).

Characteristics of structure of GBSI facilities and means quality indicators are considered. They include: failure fee, durability, safety, ecological compatibility, ergonomics, etc., complex and integral indicators are also included. The integral ones comprise: outcome, resource intensity, operability, efficiency.

The methodology for developing of concept for system integration of cosmodrome GBSI is described, it includes 4 hierarchical levels of research. The developed methodology makes it possible to solve the following tasks:

- building up of a rational cosmodrome GBSI image as an integrated complex system;
- building up of a rational image of individual highly technical complex facilities of cosmodrome GBSI, such as launch complex, technical complexes, fueling and neutralization stations, etc.

The presented materials subject to practical application in solving problems of scientific and technical coordination and control of knowledge intensive developments in performance complex works on GBSI.