SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)
Future Space Transportation Systems Verification and In-Flight Experimentation (6)

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FLIGHT TEST PROGRAM "AIR LAUNCH DEMONSTRATOR"

Abstract

The report contains description of the flight test program on creation of the "Air Launch" technology demonstrator. The "Air Launch" space transportation system (STS) is intended for the launches of lightweight spacecraft into various orbits, including geostationary orbit and into escape trajectories, by means of a two-stage launcher, which is ejected at high of 10000 meters from the transport-launch container, allocated in cargo cabin of the AN – 124-100 carrier aircraft.

The project's technical solutions provide a higher level of the STS technical characteristics in comparison with all existing and developing air launch projects in the world. It is stipulated by a conceptually new, without any precedents in the world practice, technology of high-altitude ejection of launch vehicle in a "microgravity" mode with using of "pop-up" launch technology, that allows to provide a payload capability from 1 ton to 4 tons for the launch vehicle, which starts to the near-equatorial orbits after its ignition in horizontal flights.

The flight test program "Air Launch Demonstrator" is developed in order to fulfill this innovative technology during the real flight. The Demonstrator is a flying laboratory based on the AN – 124-100 aircraft, which includes some real components of Air Launch Space Transportation System (Transporting and Launching Container (TLC), ejection control, telemetry and so on).

Nowadays, there is a program for the implementation of Demonstrator's tests by using weight-dimensional mock-ups of the launch vehicle that have to be near to real ones. During the flight tests the mass of weight/dimensional mock-ups will change from 25 tons in the first flight to 100 tons in the last one. Thus, the decision about the next mass increase ejected weight/dimensional mock-up will be made by the results of the previous tests.

The flight tests will be preceded by the ground tests on stands and aerodynamic tunnel of the models of carrier aircraft, launch vehicle and transporting and launching container.