

SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)
Poster Session (P)

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FEASIBILITY STUDY OF SPACECRAFT CLUSTER LAUNCHES WITH ONE LAUNCH VEHICLE
INTO VARIOUS BASIC ORBITS**Abstract**

Spacecraft cluster launches into one of the basic orbits has become widespread. For a number of reasons (one orbit, insufficient number of SC, etc.) providing the acceptable payload capacity for the launch vehicles (LV) may sometimes become a challenging task. Though the problem is mitigated if number of injection orbits is increased (two, three, more) per one launch of LV. Available data on SC injection into near-earth orbits proves the practicability of the technique to launch a cluster of SC with one LV into different orbits. The report covers the following: review data on SC launches into near-earth orbits for the past decade; sequence of injection of SC clusters into two spaced-apart orbits and allocation of LV disposal orbit (or the third injection orbit instead); parameters of separation (direction, velocity) of SC cluster providing steady departure of SC in the first orbits of autonomy and further withdrawal, SC departure design data; conditions of LV maneuvering in the phases of orbit transition, guarding against main engine plume impact on SC in autonomy; payload capability ratios and their graphic representation to design SC cluster launches for different orbits; implementation of project. Report is supplemented with video information.