

IAF SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)  
Launch Services, Missions, Operations, and Facilities (2)

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INCREASED CAPABILITIES AT ESRANGE –SMALL SATELLITE LAUNCHES AND TESTS OF  
REUSABLE MOTORS AND STAGES

**Abstract**

SSC initiated SmallSat Express in order to meet the increasing demand for launch opportunities for small satellites. The launch service from Esrange Space Center will enable dedicated launches with focus on low earth polar and sun synchronous orbits at 500 km altitude on a regular basis. Consecutive launches will enable the establishment of a satellite constellation covering every local time. A phase A study showed that it is technically feasible and was followed by a phase B1 study which succeeded to find political endorsement in Sweden. A phase B2 study on establishing a launch facility for small satellites at Esrange is now in its final stage. The study has resulted in preliminary designs of infrastructure, satellite stacking and deployment concepts as well as processes for payload and launch vehicle handling. Analyses of launch vehicle options and adherent flight safety analyses have been conducted and the work will continue in April with the next phase of the SmallSat Express project. The preliminary design review of the phase B2 study is scheduled for March 2018. The study has been co-financed by the County Administration of Norrbotten. The Swedish National Space Agency and SSC have also handed over a business plan for SmallSat Express ordered by the Swedish government to the Ministers concerned in the beginning of 2018. This will form the basis for the government's decision in 2018 to invest in the establishment of the launch site for small satellites. Intermediate goals towards the aim to perform the first launch from Esrange in 2021 are the establishment of a test firing facility for solid and liquid rocket motors in 2018 and dedicated test facilities for reusable sounding rocket motors, reusable first stages tethered tests, jump-tests and controlled landing of reusable sounding rockets, boosters and first stage engines by 2019. Esrange Space Center is located above the Arctic Circle (68N, 21E), in the very north of Sweden. Up to date, over 550 sounding rockets and over 630 balloons have been launched on behalf of the international scientific community, space agencies and commercial customers. This paper will present the latest results of the phase B2 study and the steps taken towards establishing a launch facility for small satellites at Esrange.