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SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)
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SMALLSAT EXPRESS A FUTURE LAUNCH SERVICE FOR SMALL SATELLITES

Abstract

To meet the increasing need for launch opportunities for small satellites, SSC initiated project SmallSat Express, a European launch capability a few years back. The intention is to offer a launch service for small satellites from SSC's launching facility Esrange Space Center located in the very north of Sweden. The launchers will be dedicated for small satellites and regularly launch them into standardized orbits.

The launch service will enable a standardized orbit suitable for most small satellites; sun-synchronous orbit at 500 km altitude (inclination = 97.4 degrees) with the ascending node at 0600, 2200, and 1400 ("dawn-dusk" orbit) Local Solar Time. By using the launch service on three consecutive launches a constellation of satellites covering every local time can be established. The launch periods, one to three per year, will be fixed. The total payload mass per launch will be around 150 kg. The goal is to launch the first satellite in 2021.

Esrange is located in the very north of Sweden, above the Arctic Circle and has access to a vast, uninhabited recovery area. The facility has been operated since 1966 and is presently used for sounding rocket and balloon launches. It also hosts one of the world's largest civilian satellite ground stations.

A feasibility study has proved that it is technically possible to launch small satellites from Esrange. The feasibility study was followed by a phase B1 study aiming for political endorsement, mainly in Sweden. As a result of the phase B1 study, the Swedish government appointed a national coordinator to further investigate the possibility to establish a launch capability at Esrange. The report from the national coordinator was delivered in October 2016, with a recommendation that the government ought to take the next step and provide capital for the establishment of a launch facility for small satellites. The government has stated that they hope to come up with an answer on how to proceed during 2017.

SSC was recently awarded funding for a phase B2 study of the project from the county administrative board of Norrbotten as a consequence of the recommendation from the national coordinator. This study will include analysis of launcher alternatives, flight safety risk assessment, design of infrastructure at Esrange and orbit raiser design (concept and main engine) if an orbit raiser is needed.

This paper will present SmallSat Express in more detail and report the current status of the phase B2 study.