

SPACE PROPULSION SYMPOSIUM (C4)
Propulsion System (1) (1)

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DEVELOPMENT STATUS OF THE 7TONF LOX/KEROSENE GAS GENERATOR CYCLE ENGINE
FOR KSLV-II**Abstract**

The development status of the 7tonf LOx/Kerosene gas generator cycle engine for Korea Space Launch Vehicle II(KSLV-II) is presented. The engine is the 3rd stage engine of KSLV-II that has a mission target to deliver 1.5 ton class payload into a low earth orbit. The engine development program began in 2011 and one powerpack test article and two development engines have been tested.

To investigate the feasibility of the engine system design, the powerpack, integrated with gas generator, turbopump, flow rate control valves, and shutoff valves, was tested for 7 starts and 377 seconds. We could not only verify the powerpack performance through the tests, but also fix the design fault of gas generator ignitor.

The first development engine for sea-level test, designated as 1G, was tested for 12 firings and 157 seconds, including refurbished test article. The test campaign for the 2G engine, the second development engine for sea-level test, is on progress. During the long duration hot firing test of the engines, we observed a performance degradation with time. Based on energy balance analysis of engine and gas generator autonomous test, it is certain that the performance decay is caused by soot deposition on turbine nozzle throat of the turbopump. In order to minimize soot deposition rate, the 2G engine was manufactured with smaller number of turbine nozzle having the same equivalent throat area of initial design. The improved results were acquired and the additional efforts for reducing the soot deposition is on progress.