

Upgraded Vikas engine — with more thrust — will boost ISRO's rockets

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All three satellite launch vehicles of the Indian Space Research Organisation (ISRO) are set to add muscle to their spacecraft lifting power in upcoming missions this year. The space agency has improved the thrust of the Vikas engine that powers all of them. The agency said the high-thrust engine qualified on Sunday after a ground test lasting 195 seconds (over three minutes).

Main beneficiary

The main beneficiary of the high-thrust Vikas engine is said to be the heavy-lifting GSLV-Mark III launcher, which ISRO expects will put 4,000-kg satellites to space. This would be the third Mk-III and the first working one to be designated MkIII Mission-1 or M1.

The first MkIII of June

Soaring high

The Vikas engine is aimed at improving the payload capability of PSLV, GSLV and GSLV Mk-III launch vehicles



■ Vikas is a family of liquid fuelled rocket engines

■ **Utility:** The engine is the workhorse liquid rocket engine powering the second stage of India's PSLV; second stage and the four strap-on stages of GSLV ; and twin engine core liquid stage (L110) of GSLV Mk-III

■ **Performance:**

Thrust 800 kN₂

Specific impulse: 290 seconds

■ **Dimension**

Length 3.70 m (12.1 feet)

■ **Liquid-fuel engine:**

Propellant: N₂O₄

■ **Cycle:** Gas generator

2017 started with a 3,200-kg satellite and the second one is being readied for lifting a 3,500-kg spacecraft.

The Vikas engine “will improve the payload capability of PSLV, GSLV and GSLVMk-III launch vehi-

cles,” ISRO said. The improvement effort, the second such since December 2001, was conducted at ISRO Propulsion Complex in Mahendragiri, Tamil Nadu.

S. Somanath, Director, Launch Vehicles Centre,

Vikram Sarabhai Space Centre, said the incremental benefit of the upgraded engine should be seen in the PSLV and GSLV missions over the coming months. Mk-II-D2, the second test flight of the heavy-lifter, is being assembled. The new engine will be used in the subsequent mission – M1.

The Vikas engine is used in the second stage of the light lifting PSLV; the second stage and the four add-on stages of the medium-lift GSLV; and the twin-engine core liquid stage of Mk-III.

Mr. Somanath said that, eventually, ISRO will phase out Vikas by replacing it first in Mk-III with a cleaner and safer semi-cryogenic engine. The semi-cryo engine is ready for trial; its stage has just been approved. “I cannot predict when it [the replacement] can happen,” he said.