

India successfully fires heaviest launch vehicle

GSLV MkIII-D1 places heaviest satellite GSAT-19 into orbit

T.K. ROHIT

SRIHARIKOTA

India on Monday leapfrogged into a select group of nations having their own indigenous cryogenic engine technology, when the Indian Space Research Organisation (ISRO) successfully launched its heaviest launch vehicle, GSLV MkIII-D1, and placed the country's heaviest satellite till date, GSAT-19, into a precise orbit.

The rocket lifted off from the second launch pad into clear blue skies at 5.28 p.m., and soared above the moon which was rising in the evening, leaving a plume of smoke, a bright orange light shining below the rocket as the cryogenic engine fired up and took the rocket on its intended path.

The GSAT-19, a communication satellite, expected to enhance India's communication infrastructure, was placed into a Geosynchronous Transfer Orbit (GTO), 16 minutes after launch, with a perigee (closest point to Earth) 170 km and apogee (farthest point from Earth) 35,975 km. It will take about two to three weeks to be placed in its intended orbit.

The satellite weighs 3,136 kg. This successful launch will enable India to launch 4-tonne class satellites from India. These were earlier launched from launch pads abroad.

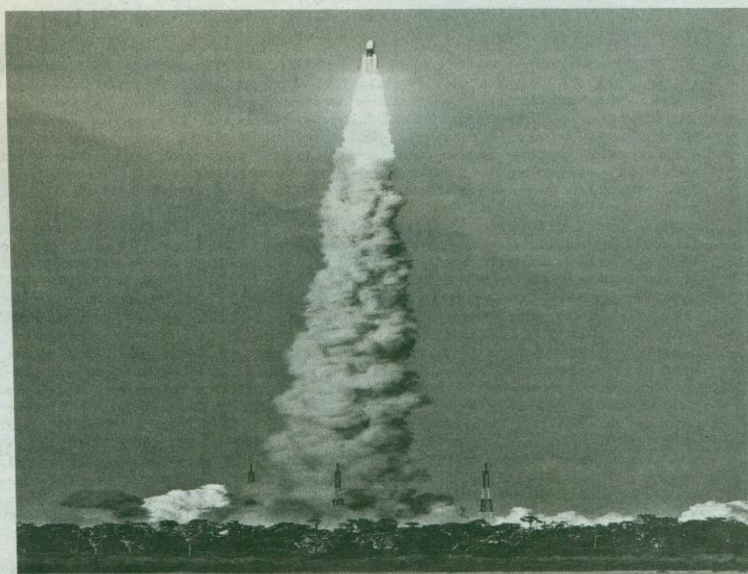
The cryogenic engine, which ignited roughly about 5 minutes after lift-off, and was firing for 640 seconds, "was a culmination of large amounts of work done over decades," A.S. Kiran Kumar, Chairman, ISRO, told a press conference after the launch.

Russian design

ISRO has been trying to master development of an indigenous cryogenic for decades and has used indigenous cryogenic engines on earlier GSLV flights but modelled mainly on Russian designs.

On this GSLV, no technological element was borrowed or adapted from any other space organisation, Somanath S., Director, Liquid Propulsion Systems Centre (LPSC), ISRO, said.

"The cryo stage is a complex technology. We were making it for the first time; we faced no serious test failures or problems. That is a world record," he said,



New horizons: The GSLV MkIII being launched from Sriharikota in Andhra Pradesh on Monday. ■ S.R. RAGHUNATHAN

adding that despite limited resources, "it is a marvel that we were able to achieve this."

When the indigenous cryogenic engine started firing, the mood at Mission Control was "upbeat," Mr. Kiran Kumar said. He said the engine was being tested and perfected since December 2014.

"Based on experience, we made modifications and had all issues addressed. More than 199 tests have been done since December 2014. The entire team was confident," the Chairman said, however adding that "there were some butterflies in the stomach."

The GSAT-19 carries a Ka/Ku-band high throughput communication transponders. It also carries a Geostationary Radiation Spectrometer (GRASP) payload to monitor and study the nature of charged particles and the influence of space radiation on satellites and their electronic components, according to ISRO. "The spacecraft will open up a lot of new vistas in the field of Internet connectivity,

broadband connectivity," P.K. Gupta, project director, said.

Business opportunities

The successful launch of the GSLV MkIII-D1 also opens up business opportunities for ISRO. "Definitely the credibility of the system goes up and customers will have greater confidence," Mr. Kiran Kumar said, adding that it would reduce insurance premiums.

"As far as Mk III is concerned, we are planning two launches every year. Right now our focus is on making sure that right now whatever bottlenecks are there in achieving our 12 launches per year or slightly more, can be achieved only after that we will look at other bottlenecks," he said.

More launches

There are two launches that are coming up, which will however, happen from Ariane in French Guiana. The first one scheduled for June 28, will be the GSAT 18, a 3.3 tonne satellite, and the second one will be a 5.8 tonne satellite.