एन्ट्रिक्स कॉर्पोरेशन लिमिटेड
ANTRIX CORPORATION LIMITED
एक मिनिरत्न कंपनी
A Miniratna Company

इन्साइट
INSIGHT

भारत के अंतरिक्ष वाणिज्यिक क्रियाकलाप : एक अंतर्दृष्टि
An insight into India's Space Commercial Activities

अप्रैल 2017, खण्ड 2
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Company Updates

104th and 105th Board Meetings of ANTRIX were held on 10 January 2017 and 25 March 2017 respectively.

During the 104th Board Meeting, the Board approved Shri S. Kumaraswamy, Joint Secretary, DOS as one of the shareholders of the Company on behalf of the President of India, in place of Shri A. Vijay Anand who ceased to be a Director on the Board consequent upon his retirement on Superannuation.

Shri S. Pandian, Associate Director (Projects), VSSC was appointed as Nominee Director on the Board of ANTRIX with effect from 02 March 2017.

Current Board of Directors of ANTRIX:

The Board of Directors of Antrix consists of reputed professionals with long-standing experience in space programme, administration, academia and industry verticals. The present composition of the Board of Directors of the company is as under:

Functional Director (full-time)
Shri Rakesh Sasibhushan, Chairman cum Managing Director

Government Nominee Directors
Shri S. Kumaraswamy, Joint Secretary, DOS
Shri C.M. Sane, Joint Secretary (Finance), DOS

ISRO Nominee Directors
Dr. Y.V.N. Krishnamurthy, Director, National Remote Sensing Centre (NRSC)
Dr. M. Annadurai, Director, ISRO Satellite Centre
Dr. P.G. Diwakar, Scientific Secretary, ISRO
Shri S. Pandian, Associate Director (Projects), VSSC

Independent Director
Shri S.K. Jain, Director, IIT, Gandhinagar

"Very Good" Rating for MoU

- Department of Public Enterprises has given **"Very Good"** rating to ANTRIX for MoU for the Year 2015-16.

"Excellent" Rating for Corporate Governance

- Department of Public Enterprises has given **"Excellent"** rating to ANTRIX for Corporate Governance for the year 2015-16.

From the CMD's Desk

Rakesh Sasibhushan
Chairman cum Managing Director

Dear Reader

Last year Boeing approached FCC for a license to operate a constellation of 1,396 to 2,956 V-band satellites followed by five other companies including Space-X and Oneweb. With this, the number of space companies who have announced their intent to operate mega Satcom constellations, employing hundreds or thousands of satellites, came to nearly ten. This is an indication of the growing demand in the Satcom market and the opportunities therein. Most of these constellations are meant for providing broadband services by employing small satellites at LEO or MEO orbits. Their technical capabilities are impressive and an indicator towards what is to come. Tomorrow, satellite broadband may outperform other Satcom applications and what more, it may render other applications obsolete! However, one has to wait and see how these constellations are going to perform in the emerging commercial scenario.

What I would like to focus at this stage is the opportunity that these constellations would provide to the Indian Space industry. In addition to bringing high-speed internet to every part of the world, this will also create a huge demand for satellite sub-systems and Launch services in the next two to three years. Since many of these constellations employ small satellites in LEO having 3 to 5 years life, the demand for replacement of these satellites will also be high and should provide a sustained market for sub-system providers. This could be the opportunity we are looking for, and should provide economies of scale to make the sub-system production commercially viable! Hopefully we can work together to tap this opportunity and build a strong space eco-system in India.

ANTRIX has implemented ERP

Antrix promotes and commercially markets the products and services emanating from the Indian Space Programme. In order to enhance collaboration between different stakeholders, automate process workflows and adopt best business practices, Antrix has implemented ERP using Infor LN ERP solution. Purchase Contract management, Sales Contract Management, Finance Management and Document management modules are implemented. Alerts, activities, tasks and approval cycles are managed through social collaborative platform Infor Mingle, which is integrated with Infor ERP.

Events

India International Science Festival

ISRO and Antrix participated in the India International Science Festival 2016 (IISF-2016) organized by Ministry of Science & Technology, Ministry of Earth Sciences and VijnanaBharati at New Delhi during December 7-11, 2016. A mega Science, Technology and Industry Expo was also held as part of IISF-2016. The objective of this Science Festival is to expose the fruits of Science and Technology to the masses, building strategy to instil scientific temper among people, aimed to provide a platform to young Indian Scientists for the exchange of knowledge and ideas. ISRO had an impressive pavilion with posters, models and visuals on various aspects Space Science and Technology.

ISRO Scientist explaining the satellite model to young students.

Hindi Workshop

ISRO HQ and ANTRIX jointly organized the Hindi Workshop on March 28, 2017 at Antrix Corporation Limited. The workshop focussed on "Official Language Implementation: Simplified technological and computerized implementation" and "Science behind human brain". Dr. G R Choudhary from DRDO presented his views on these topics. About 50 participants benefited from the programme.

CMD, ANTRIX and ED (Operations), ANTRIX during the inaugural session of Hindi Workshop.

Recent Agreements

Agreements with GAF AG, Germany

GAF AG, Germany, and Antrix have extended the access agreements for Resourcesat-2 and Cartosat-1 data reception by GAF AG, Germany.

GAF AG, Germany, and Antrix have signed a Memorandum of Agreement (MOA) for Joint Exploration of Remote Sensing Business Opportunities. The basic purpose of this MOA is for joint collaboration in the areas of (i) Remote Sensing Data Acquisition, Processing and Distribution of Data Products from IRS satellites; (ii) Execution of Remote Sensing Applications projects and consultancy studies for third parties; (iii) Conducting Training Programme and (iv) Value addition for satellite data as well as the distribution of IRS Satellite data including IRS-1C/1D and Resourcesat-1.

Agreement with IMD, India

ANTRIX has entered into a MOU with India Meteorological Department (IMD) for the establishment of Multi Mission Meteorological Data Receiving and Processing System (MMDRPS) facility at IMD premises in New Delhi on March 06, 2017. This facility is expected to cater to the reception and processing of data from INSAT-3DR satellite, in addition to Kalpana-1, INSAT-3A and INSAT-3D satellites.

Forthcoming Missions

GSAT-9 satellite is configured to augment the growing need of Ku band transponders. It carries 12 Ku-Band Transponders. The spacecraft employs the standard I-2K structure with the power handling capability of around 3000 W, with a lift off mass of 2195 kg. It is designed for a mission life of 12 years.

GSAT-19 is planned as the payload for the first developmental flight of the indigenous GSLV-Mk III-D1 Launcher. The satellite is planned to carry Ka and Ku band payload along with a Geostationary Radiation Spectrometer (GRASP) payload to monitor and study the nature of the charged particles and influence of space radiation on spacecraft and electronic components.

The next satellite in the Cartosat-2 Series will provide Panchromatic data of 65 cm resolution over 10 km swath and Multispectral data in 4 bands of 2.0 m resolution over 10km swath. The data could be potentially used for various cartographic applications, urban planning and infrastructure development and disaster management applications.

Launch Services

PSLV-C37 Mission successfully launched 104 satellites

PSLV-C37 mission placed a total of 104 satellites into designated orbit on 15th February, 2017 from Satish Dhawan Space Centre, Sriharikotta. This included ISRO's Cartosat-2 series as the primary satellite, two nano satellites from ISRO and 101 nano satellites from international customers. The international satellites include 96 satellites from United States of America, one each from Kazakhstan, Israel, The Netherlands, Switzerland and United Arab Emirates. The detailed breakup is as follows:

Satellite	Country	Mission objective
PEASSS	The Netherlands	Technology demonstration
DIDO-2	Switzerland	Micro-gravity research
BGUSat	Israel	Technology demonstration for avionic systems
Al-Farabi-1	Kazakhstan	Technology demonstration
Nayif-1	UAE	Technology demonstration
DOVE (88Nos)	USA	Earth observation
Lemur(8 Nos)	USA	Radio occultation and AIS

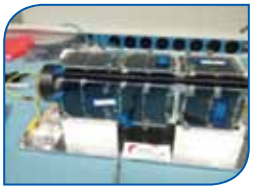
DOVE Flock-3P nano satellites are a fleet of remote sensing satellites that will image the entire Earth every day for commercial, environmental purposes. The Dove satellites are designed, built and operated by Planet Inc., headquartered in San Francisco, USA.

LEMUR nano satellites of Spire Global Inc. (San Francisco, CA), USA are meant for providing vessel tracking using Automatic Identification System (AIS), besides carrying out weather measurement using GPS Radio Occultation.

The PEASSS satellite is technology demonstration satellite from a European consortium of Partners owned by Innovative Solutions In Space BV of The Netherlands. The DIDO-2 nano satellite belongs to SpacePharma of Switzerland. The BGUSat is built by Israeli Aerospace Industries in cooperation with the Ben Gurion University. The Al-Farabi-1 is a technology demonstrator built by Al-farabi Kazakh National University. Nayif-1 nanosatellite is from Mohammed Bin Rashid Space Centre, Dubai.

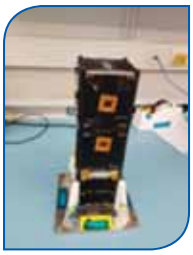
Dove Satellite (USA)

Lemur Satellite (USA)

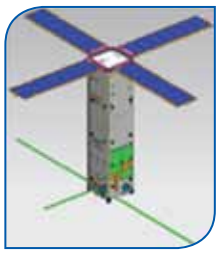


DIDO-2 (Switzerland)

NAYIF-1 (UAE)



PEASSS (The Netherlands)



BGUSat (Israel)

Al-Farabi-1 (Kazakhstan)

Mission Support Services

ANTRIX provided Transfer Orbit Support Services (TOSS) for EchoStar-23 satellite from MCF Hassan to M/s Intelsat, USA during March 2017.

CSR Activities

Distribution of Assistive devices and appliances to the differently abled persons

As part of CSR Activities, ANTRIX organized a Distribution Camp at SHAR, Sriharikota in association with Artificial Limbs Manufacturing Corporation of India, during 10-11 March 2017 to assist and empower the Persons with Disabilities (PwD's) by providing Assistive devices and appliances. During the programme, 773 beneficiaries, identified with orthopedically, visually and hearing disabilities, from Sulurpeta, Tada and Doravari Satram Mandals, adjoining SHAR, in Nellore District, Andhra Pradesh, were provided with assistive devices and appliances.

Various appliances like Battery Operated Motorized Tricycles, Wheelchairs, Tricycles, Axilla/Elbow, Crutches, Walking Sticks, Rollators for Orthopedically Impaired persons, Behind The Ear - Hearing Aid machines, Smart canes, Smart Phone, Daisy Player, Braille Cane, MSID kit, Walkers ADL kits were distributed in the camp for different kind of disabilities to the beneficiaries.

Sri Rakesh S, CMD, Antrix, Shri P Kunhikrishnan, Director, SHAR and Shri JV Raja Reddy, Controller SHAR inaugurated the programme and distributed the appliances.

Inauguration and handing over of Sewage Treatment Plant

ANTRIX has constructed 125 KLD (Kilolitres per Day) Sewage Treatment Plant (STP) in the Hiremath Samsthan Vidyapeetha Trust, a residential orphanage school, Bhalki, Bidar district. The activity was implemented under the supervision of NRSC and ISRO Headquarters. These STPs were handed over to the Mutt on 28th Feb 2017. Sri Rakesh S, CMD, ANTRIX, Dr. YVN Krishnamurthy, Director, NRSC and Swamiji of the Mutt, Sri Basava Linga Pattadevaru, were present on the occasion.

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For feedback and/or details, please write to us at mail@antrix.gov.in

Antrix Corporation Limited (ANTRIX), a Mini-Ratna company, is a wholly owned Government of India Company under the administrative control of Department of Space (DOS). ANTRIX is the commercial arm of the Indian Space Research Organisation (ISRO). ANTRIX promotes and commercially markets the products and services emanating from the Indian Space Programme.

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