

6. ISRO's NavIC set to be commercialised by Antrix

Prelims: Space Technology

Mains: GS-III Awareness in the fields of Space.

Why in News?

- ▶▶ The Indian Space Research Organisation (ISRO) and its commercial arm Antrix Corporation Ltd. are poised to commercialise India's regional navigation satellite system, NavIC.
- ▶▶ Antrix has recently floated two separate tenders to identify industries that can develop dedicated NavIC-based hardware and systems.

About Navic (Navigation in Indian Constellation):

- ▶▶ NavIC is the Indian system of seven (currently eight) satellites that is aimed at telling business and individual users where they are, or how their products and services are moving. The indigenous positioning or location-based service (LBS) works just like the established and popular U.S. Global Positioning System or GPS, but within a 1,500-km radius over the sub-continent.
- ▶▶ About IRNSS (Indian Regional Navigation Satellite System):
- ▶▶ IRNSS is an independent regional navigation satellite system designed to provide position information in the Indian region and 1500 km around the Indian mainland.
- ▶▶ The Indian Regional Navigation Satellite System (IRNSS) is similar to that of GPS (global positioning system) of the US, Glonass of Russia and Galileo of Europe as well as China's Beidou.

Features:

- ▶▶ It is a constellation of total 7 satellite launched in space and a ground facility on land to receive signals from space satellites. 3 of its satellite Located in Geostationary orbit and 4 are inclined to geosynchronous orbit. However full NAVIC system has 9 satellite, 2 on ground in standby mode.
- ▶▶ 4 Geosynchronous satellites: They will be orbiting in pairs in two inclined geosynchronous orbits. When observed from the ground, these 2 pairs of satellites will appear to travel in figures of '8'.
- ▶▶ 3 geostationary satellites: They will be placed in the geostationary orbit over the equator. They match the Earth's rotation and shall remain at a fixed position in the sky.
- ▶▶ It covers whole India and region surrounding it up to 1500 km.

- ▶▶ It provides accuracy up to 20m as claimed by ISRO.

How many IRNSS Satellites are up there now?

- ▶▶ There are currently eight IRNSS satellites (1A to 1I) in orbit. A, B, F, G are placed in a geosynchronous orbit, while the remaining three, C, D, E, are located in geostationary orbit. The last IRNSS, 1H, which was launched on August 31, 2017 was unsuccessful as the satellite did not come out of its heat shield. IRNSS-1I was launched last year to replace India's first navigation satellite IRNSS-1A, whose three Rubidium atomic clocks had stopped working. The malfunctioning of the Europe-imported atomic clocks in IRNSS-1A made it difficult to measure precise locational data from the satellite.

What areas will it cover?

- ▶▶ **Primary Service Area:** To provide accurate position information service to users in India as well as the region extending up to 1500 km from its boundary, which is its primary service area.
- ▶▶ **Extended Service Area:** It lies between primary service area and area enclosed by the rectangle from Latitude 30 deg South to 50 deg North, Longitude 30 deg East to 130 deg East.

What all services are provided?

- ▶▶ IRNSS would provide two types of services, namely
 - ✓ Standard Positioning Services available to all users and
 - ✓ Restricted Services provided to authorised users. (Encrypted)

Significance of IRNSS:

- ▶▶ India became one of the 5 countries having their own navigation system like GPS of USA, GLONASS of Russia, Galileo of Europe and Beidou of China. So, India dependence on other countries for navigation purposes reduces.
- ▶▶ It will help to mitigate the disaster effects by providing information of disaster timing, safe location and also help the disaster relief management to make earlier plans and save the lives of people in India as well as up to 1500 km around it.
- ▶▶ It will help the mariners for far navigation and fisherman for get information about the valuable fisheries location and any disturbance in Sea.
- ▶▶ It will help to make friendly relations with others countries by providing real time information during any calamity or disaster for mitigate its after effect and for making early plans.

Recent Positive Developments:

- ▶▶ In mid-October, ISRO announced that Qualcomm Technologies, Inc., a leading producer of semiconductor chips, had developed and tested NavIC-friendly chipsets across its user bases and that it would add NavIC to them.
- ▶▶ Apart from GPS, its chips can work with the global navigation satellite systems of Europe (Galileo), Russia (GLONASS) and China (Beidou.)
- ▶▶ The third and important positive for NavIC was the certification of the Indian system by the 3GPP (The 3rd Generation Partnership Project), a global body for coordinating mobile telephony standards.

