NVS-03 reaches Geosynchronous Orbit

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Why in News?

Recently, ISRO's NVS-03 (Next-Generation Navigation Satellite) has successfully reached its intended Geosynchronous Orbit (GSO).

Key Highlights

- **Mission Profile & Vehicle-** Originally launched aboard the **GSLV-F18** rocket into an initial Geosynchronous Transfer Orbit (GTO) on October 30, 2026.
- The satellite was raised to its final orbit through 4 Liquid Apogee Motor (LAM) orbit-raising maneuvers.
- **Constellation Augmentation -** NVS-03 is the third spacecraft in the NVS series.
- It is designed to replace older, aging satellites and replenish the **NavIC** (Navigation with Indian Constellation / IRNSS) space segment.
- **Indigenous Rubidium Atomic Clock-** The satellite features an indigenously developed **Rubidium Atomic Clock** (by SAC, Ahmedabad).
- It mitigates past reliance on imported atomic clocks that had suffered high failure rates in early IRNSS satellites.
- **L1 Band Signal Inclusion -** In addition to the conventional **L5** and **S-bands**, NVS-03 broadcasts in the interoperable **L1 civil frequency band**.
- It allows seamless integration into personal consumer electronics like smartphones, smartwatches, and vehicle telematics.
- **Mass -** ~2,250 kg
- **Mission Life -** ~12 years.
- **Coverage Area -** Indian landmass and an extended region up to 1,500 km beyond its boundaries.

NavIC (IRNSS)

- **NavIC** (*Navigation with Indian Constellation*, formerly IRNSS) is an independent regional satellite navigation system designed, built, and operated by ISRO.
- **Constellation Architecture -** Standard baseline architecture consists of 7 operational satellites (3 in Geostationary Orbit (GEO) and 4 in inclined Geosynchronous Orbit (GSO)) supported by a ground control network.
- **Services Offered**
    - **Standard Positioning Service (SPS) -** Open to all civilian users (positioning accuracy <20 metres, timing accuracy <40 nanoseconds).
    - **Restricted Service (RS)-** An encrypted signal intended exclusively for authorized strategic, defence, and security agencies.
- **Global Recognition-** Recognized by the **International Maritime Organization (IMO)** as a

component of the World-Wide Radio Navigation System (WWRNS) for ocean navigation.



Reference

[The Hindu | NVS-03 in geosynchronous orbit]



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