DAILY PT POINTERS

17 August, 2024

HEADLINES OF THE DAY

The Hindu-Space(GSIII)-Page-6

ISRO's SSLV successfully launches earth observation satellite into orbit

SSLV-D3 lifts off from Satish Dhawan Space Centre; the satellite EOS-08 incorporates a host of technological developments along with three payloads; the rocket has placed the spacecraft in 'a very precise orbit', says ISRO Chairman Somanath

Hemanth C.S.
BENGALURU

The Indian Space Research Organisation on Friday launched the EOS-08 Earth Observation Satellite on board the Small Satellite Launch Vehicle (SSLV-D3) from the Satish Dhawan Space Centre (SDSC) in Sriharikota. The SSLV-D3, in its final development flight, lifted off from the first launch pad of SDSC at 9.17 a.m.

Seventeen minutes later, the EOS-08 satellite was injected into a 475-km circular orbit as intended. "The third developmental flight of SSLV, the SSLV-D3 with the EOS-08 satellite, has been successfully accomplished. The rocket has placed the spacecraft in a very precise orbit as planned. I find that there are no deviations in the injection conditions. The current indication is that everything is perfect," ISRO Chairman S. Somanath said after the launch.

Sky high: ISRO's SSLV-D3 blasts off with Earth Observation Satellite EOS-08 in Sriharikota on Friday. PTI

EOS-08 is a first-of-its-kind mission built on a standard ISRO's Microsat/IMS-1 bus with a suite of advanced payloads for observation in the IR range, novel GNSS-R Payload and SiC UV dosimeter.

The satellite boasts a host of new technological developments in satellite mainframe systems like an Integrated Avionics system – Communication, Baseband, Storage and Positioning (CBSP) Package, Structural panel embedded with PCB, embedded battery, Micro-DGA (Dual Gimbal Antenna), M-PAA (Phased array antenna) and Flexible solar panel & Nano star sensor etc., for on-board Technology Demonstration.

It carries three payloads, namely Electro Optical Infrared Payload (EOIR), SAC, Global Navigation Satellite System – Reflectometry payload (GNSS-R), SAC and SiC UV Dosimeter, LEOS. The EOIR payload is to image in the Mid-Wave IR (MIR) band and long-wave IR (LWIR) band during day and night for various applications like satellite-based surveillance, disaster monitoring, environmental monitoring, fire detection, volcanic activities and industrial and power plant disaster.

GNSS-R payload is to demonstrate the capability of using GNSS-R-based remote sensing to derive applications like Ocean Surface Winds, Soil moisture, Cryosphere applications over the Himalayan region, flood detection, in-land water body detection, etc.

The spacecraft mission configuration is set to operate in a circular Low Earth Orbit (LEO) at an altitude of 475 km and has a mission life of one year.

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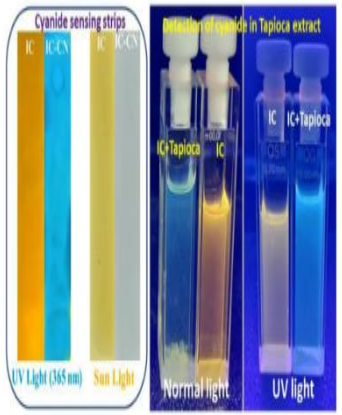
HEADLINES OF THE DAY

The Hindu –Science and Tech (GSIII)-Page 6

Kerala researchers develop breakthrough cyanide sensor to enhance safety of water, food products

C.P. Sajit
KASARAGOD



The material appears yellow to the naked eye when dissolved, but turns colourless upon detecting cyanide. SPECIAL ARRANGEMENT

A research team at the Central University of Kerala has achieved a significant breakthrough in chemical sensing by developing a highly sensitive and selective cyanide sensor. Led by Ravi Kumar Kanaparthi of the Department of Chemistry, the team has created a material capable of detecting toxic cyanide at low concentrations, promising to enhance the safety of drinking water and food products.

Cyanide, a potent toxin, is present in various plants, fruits, and microorganisms. The World Health Organization (WHO) has set strict guidelines for its presence in potable water, limiting cyanide concentrations to below 0.19 mg/L due to its lethal effects on humans and aquatic life. Cyanide exposure can occur through consumption of certain foods like cassava (tapioca) and even common items like apple and apricot seeds, sprouting potatoes, and almonds. The risk is particularly severe in regions where cyanide-rich foods are staples.

The team addressed this critical need by designing a novel sensor that offers both high sensitivity and selectivity. The material they developed appears yellow to the naked eye when dissolved, but turns colourless upon detecting cyanide. This colour change provides a straightforward visual cue, making it easy to identify the presence of cyanide. Moreover, the material selectively detects cyanide without interference from other competing ions, ensuring accuracy in various testing environments.

Practical applications

The practical applications of the sensor are wide-ranging. The team demonstrated its effectiveness in detecting cyanide in tapioca extracts, where the sensor's colour shifts from yellow to bluish-green, and developed a strip for qualitative detection.

The innovation is relevant given recent incidents of cyanide poisoning. On January 2, the Animal Husbandry Department reported the death of 13 cows in Idukki due to cyanide toxicity after consuming tapioca hulls.

The research has been published in the *Journal of Photochemistry and Photobiology A: Chemistry*.

Their paper, titled "A Highly Sensitive Colorimetric and Fluorometric Sensor for the Detection of Cyanide," details the sensor's design and functionality.

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HEADLINES OF THE DAY

The Hindu –Economy (GSIII)-Page 12

Centre unveils new system to study weather, crop patterns

The Hindu Bureau
NEW DELHI

The Union Agriculture Ministry launched a digital geo-spatial platform, Krishi-Decision Support System (DSS), here on Friday which will share real-time data-driven insights on weather patterns, soil conditions, crop health, crop acreage, and advisories with all stakeholders such as farmers, experts, and policymakers. The Ministry said the system was

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- The Ministry said the system was “a significant milestone” in the country’s agricultural innovation landscape.

HEADLINES OF THE DAY

Indian Express-Governance(GSII)-Page 15

International market data till 1900 IST

Centre finalises tender to procure 1,000 GPUs under IndiaAI Mission

SOUMYARENDRA BARIK
NEW DELHI, AUGUST 16

File

THE GOVERNMENT has finalised a tender document to procure 1,000 graphics processing units (GPUs) as part of its ambitious IndiaAI Mission and offer computing capacity to Indian start-ups, researchers, public sector agencies and other entities approved by the government, The Indian Express has learnt. A requirement of data localisation has also been considered in the tender.

The move is part of the Rs 10,370 crore IndiaAI Mission to establish a computing capacity of more than 10,000 GPUs and also help develop foundational models with a capacity of more than 100 billion parameters trained on datasets covering major Indian languages for priority sectors like healthcare, agriculture, and governance. The idea is that if such an infrastructure exists in the country, start-ups could plug into it for developing AI systems.

Computing capacity, or compute, is among the most important elements of building a large AI system, apart from algorithmic innovation and data sets. It is also gramme in the Union Budget 2024. Last month, The Indian Express had reported that the work on the tender was complete and it could be released soon.

"IndiaAI is looking to empanel AI services on cloud and offer the services to academia, MSMEs, startups, research community, governments, public sector agencies and other entities approved by IndiaAI," the tender said.

As per the document, a consortium of partner companies can bid, with one of them designated as primary partner and the others as secondary. The maximum number of partners in a consortium will be three. Bidders can only be Indian entities incorporated under the Companies Act, 1956, LLP Act, 2008, or Partnership tender is that all AI services are to be delivered from data centres in India. "Data uploaded to their cloud platform by end users should not be sent outside the sovereign territory of India in any form (anonymous/pseudonymous/encrypted, etc.)," the tender said.

Successful bidders will have to ensure availability of AI compute capacity for consumption – a demand of up to 100 AI compute hours shall be met immediately and up to 500 AI compute hours shall be met within two days and demand of more than 500 hours of AI compute shall be met within a week.

Of India's Rs 10,370 crore plan, the implementation of computing infrastructure will be done

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HEADLINES OF THE DAY

Indian Express-Geography(GSI)/Environment(GSIII)-Page 19

Why scarce rainfall restricted the passage of ships through Panama Canal

ARJUN SENGUPTA
NEW DELHI, AUGUST 16

EXPLAINED
CLIMATE

THE FIRST ship passed through the Panama Canal on August 15, 1914. One hundred and ten years later, one of the most important shipping lanes in the world faces an existential threat from climate change.

The 82-km canal, one of history's greatest engineering feats, cuts through the Isthmus of Panama in Central America, shortening the voyage between New York on the Atlantic Ocean to San Francisco on the Pacific by about 12,600 km.

At least 36-38 ships pass through the canal every day on average. Last December however, traffic fell to 22 ships a day, with more than 160 stuck in anchor at either end of the canal. The reason: following a drought, the level of Lake Gatun, the artificial freshwater reservoir that is vital to the operation of the canal system, fell significantly.

Traffic has since been restored to more than 35 ships a day, but many experts fear this could be only a temporary respite. How does the Panama Canal work?

Water elevators

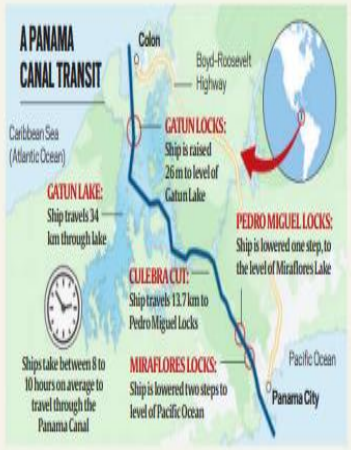
The canal is not a simple channel between two larger water bodies – it is a highly-engineered system that employs a sophisticated system of locks and elevators to carry ships across.

The system is needed because the Pacific at the canal's southern end is slightly higher than the Atlantic on the other end. This means that a ship that enters the canal from the north must gain elevation during its journey. This is achieved using a lock system which lifts and drops vessels to the required sea level at each end of the canal.

The locks act as water elevators that are flooded or drained to help ships gain or lose elevation respectively. The three sets of locks – 12 locks in all – are serviced using artificial lakes and channels. Here's how a set of locks works.

- A ship approaches the first, lowest chamber of a lock, which lies at sea level;
- The gate is opened to allow the ship into the chamber, and shut behind it;
- The valve between the first and second chamber (at a higher elevation) is opened to raise the level of water in the first chamber;
- Once the water level is equalised, the gate between the chambers is opened, and the ship enters the next chamber.

The process is repeated to gain elevation, and the opposite process is used to lower the vessel. Ships entering from the Atlantic side gain 26 m in elevation at Lake Gatun, before losing some elevation closer to the Pacific side. (See illustration)



Falling water level

Most of the water needed to facilitate the passage of ships through the system of locks is supplied from Lake Gatun by force of gravity (no pumps are needed).

According to a report by *The New York Times*, the passage of a single ship requires almost 200 million litres of water. Every day, the canal uses two and a half times the volume of water consumed by the 8 million residents of New York City.

Last year, less water in Lake Gatun meant fewer ships could pass through the canal every day, and many that did make the passage could do so only after cutting their cargo load. While water from the oceans can be used to work the system of locks, this increases the salinity of Lake Gatun, which is also the source of drinking water for more than half of Panama's 4.4 million people.

Better rainfall has led to the situation improving this year. However, experts caution that the problem remains. "Rain not only washes the streets, it washes our minds and we think the problem is gone," Carlos Urriola, president of SSA International, which operates shipping terminals around the world, including at the Panama Canal, told *The NYT*. "The problem of water is a permanent one."

The threat derives from, and is exacerbated by climate change. While extreme rainfall deficits are not unheard of in Panama, they have become increasingly frequent – and could become even more so in the future.

"Historically there has been a [rainfall] shortage on average once every 20 years due to major El Niño events. In the last 26 years this is the third major rainfall deficit. So it seems that something is changing our rainfall patterns," Steven Paton, climate change expert at the Panama-based Smithsonian Tropical Research Institute, told *The Guardian* in 2023. What happened last year statistically "has no analogue in the previous 100 years of data", he said.

A contentious solution

The Panama Canal authorities have proposed to create a second source of water for the canal by damming the Río Indio river. Last month, Panama's Supreme Court struck down a law that made the river untouchable, opening the doors for the construction of a $1.6 billion dam that is projected to fix the problem for at least the next 50 years.

But the dam's reservoir will also flood the homes of about 2,000 predominantly poor people. "They want to relocate us, but we don't think that way," Olegario Hernandez, one of the many people who will be displaced by the Río Indio dam, told *The NYT*. "There's no place better."

- The first ship passed through the Panama Canal on August 15, 1914, exactly 110 years ago.
- The 82-km canal, which remains one of the greatest feats of engineering in history, is a shortcut for ships travelling between the Atlantic to the Pacific Oceans by cutting through the Isthmus of Panama in Central America. It saves approximately 12,600 km in a trip between New York and San Francisco, and is one of the most important shipping lanes in the world.

HEADLINES OF THE DAY

PIB-Economy(GSIII)

Ministry of Finance

Department of Economic Affairs amends Foreign Exchange Management (Non-debt Instruments) Rules, 2019 in pursuance of Union Budget 2024-25 announcement

Amendments aim to simplify cross-border share swaps for greater Ease of Doing Business

Amendments to allow issue or transfer of Indian company equity instruments in exchange for foreign company equity instruments

Posted On: 16 AUG 2024 8:15PM by PIB Delhi

- In pursuance of the Union Budget 2024-25 announcement by Union Minister for Finance and Corporate Affairs Smt. Nirmala Sitharaman to simplify rules and regulations for Foreign Direct Investment and Overseas Investment, as one of the initiatives, the Department of Economic Affairs (DEA), Ministry of Finance, has amended Foreign Exchange Management (Non-debt Instruments) Rules, 2019 vide notification dated 16.08.2024.The amendments aim to simplify cross-border share swaps and provide for the issue or transfer of Indian company equity instruments in exchange for foreign company equity instruments. This will facilitate the global expansion of Indian companies through mergers, acquisitions, and other strategic initiatives, enabling them to reach new markets and grow their presence worldwide. Another key change brings further clarity on the treatment of downstream investments made by Overseas Citizen of India (OCI)-owned entities on a non-repatriation basis, aligning it with the treatment of Non-Resident Indian (NRI)-owned entities.

HEADLINES OF THE DAY

PIB-Environment/Economy(GSIII)

Ministry of Ports, Shipping and Waterways

Greening in India gets a boost with Green Tug Transition Program (GTTP) SOP launched by Shri Sarbananda Sonowal

Phase 1 of the GTTP will begin on October 1, 2024, and continue until December 31, 2027

The program is expected to involve an investment of around INR 1000 Crores in building these green tugs

The Green Tug Transition Program is a pivotal initiative towards realizing our vision of a sustainable and green maritime sector in India: Shri Sarbananda Sonowal

GTTP aims at replacement of existing diesel-powered tugs with zero-emission tugs

Posted On: 16 AUG 2024 3:42PM by PIB Delhi

- The Union Minister of Port Shipping and Waterways, Shri Sarbananda Sonowal officially launched the SOP for Green Tug Transition Program (GTTP) in New Delhi. This landmark initiative is set to drive the transition from conventional fuel-based harbour tugs to greener, more sustainable alternatives, marking a major step in India's commitment to environmental sustainability and the advancement of its maritime sector.
- The Green Tug Transition Program (GTTP) as a key initiative under the ‘Panch Karma Sankalp’. The program, announced on May 22, 2023, by the Union Minister of Ports, Shipping, and Waterways, Shri Sarbananda Sonowal, during the ‘Chintan Shivir’ event, marks a significant step towards decarbonizing maritime operations in India.