



DAILY CURRENT AFFAIRS

Kudankulam Nuclear Power Plant (KKNPP) Data Breach

Parliament Set to Consider Key Legislative Reforms: FCRA Amendment & Other Bills

Drones in Tuberculosis Diagnosis: ICMR's i-DRONE Initiative

White Rabbit Technology and India's "One Nation, One Time" Initiative

1. Kudankulam Nuclear Power Plant (KKNPP) Data Breach

Why in News?

A ransomware group, **World Leaks**, claimed to have leaked over **19,000 files** related to the **Kudankulam Nuclear Power Plant (KKNPP)**. The Government clarified that the breach involved **conventional infrastructure (Balance of Plant)** and **did not affect nuclear reactor operations or safety systems**.

Key Highlights

Particular	Details
Plant	Kudankulam Nuclear Power Plant (KKNPP), Tamil Nadu
Data Breach	Claimed by ransomware group World Leaks

Files Leaked	Over 19,000 documents
Data Affected	Balance of Plant (BoP) package for Units 3 & 4
Contractor	Reliance Infrastructure Ltd.
Investigating Agency	CERT-In
Government Position	No compromise of nuclear safety or reactor systems

What Was Leaked?

The leaked data reportedly includes:

- Engineering drawings.
- Technical documents.
- Vendor and supplier information.
- Inspection and infrastructure records.

The **NPCIL** clarified that these documents relate only to the **Balance of Plant (BoP)** and **not** to reactor control, nuclear fuel, or safety systems.

What is Balance of Plant (BoP)?

The **Balance of Plant (BoP)** consists of auxiliary systems that support power generation but are **not directly involved in the nuclear reaction**.

Includes	Does Not Include
Cooling systems	Nuclear reactor core
Water treatment	Nuclear fuel
Ventilation	Reactor control systems
Electrical infrastructure	Safety protection systems
Auxiliary buildings	Containment systems

KUDANKULAM DATA BREACH
NOT NUCLEAR SAFETY BREACH

NUCLEAR OPERATIONS & SECURITY UNAFFECTED
BREACH INVOLVES CONVENTIONAL BALANCE OF PLANT (BoP) ONLY

KEY MEMORY ANCHOR
19,000+ SENSITIVE FILES ACCESSED
NOT RELATED TO NUCLEAR PLANT OPERATIONS OR SECURITY

1 WHAT WAS BREACHED?
BoP BALANCE OF PLANT PACKAGE
INCLUDES: ELECTRICAL, WATER, HVAC, ETC.
EXCLUDES: NUCLEAR ISLAND, SAFETY SYSTEMS

2 HOW & WHERE?
19,000+ FILES STOLEN BY **WORLD LEAKS** RANSOMWARE GROUP
ACCESSED FROM **YOTTA SERVER** (THIRD-PARTY PROVIDER FOR RELIANCE GROUP)

3 CONTRACT DETAILS
AWARDED IN **2018**
EPC CONTRACT FOR BoP PACKAGE (UNITS 3 & 4)
AWARDED TO **RELIANCE INFRASTRUCTURE LTD.**

4 WHO CONFIRMED?
NPCIL (PLANT OPERATOR)
Leaked data = Conventional BoP documents & drawings
No impact on nuclear safety or operations
Plant & systems remain secure

About Kudankulam Nuclear Power Plant (KKNPP)

Feature	Details

Location	Tirunelveli, Tamil Nadu
Operator	Nuclear Power Corporation of India Limited (NPCIL)
Technology	Russian VVER-1000 Pressurised Water Reactors (Generation III+)
Collaboration	India–Russia (Rosatom)
Operational Units	Units 1 & 2 (1000 MW each)
Under Construction	Units 3, 4, 5 & 6
Planned Capacity	6,000 MW (India's largest nuclear power park)

What are VVER Reactors?

- **VVER (Water-Water Energetic Reactor)** is a Russian-designed **Pressurised Water Reactor (PWR)**.
- Uses **light water** as coolant and moderator.
- Equipped with advanced passive and active safety systems.
- Widely used in Russia, India, China and Eastern Europe.

Cybersecurity Framework for Nuclear Infrastructure

Institution	Role
NPCIL	Operation and cybersecurity of nuclear plants
CERT-In	National agency for cybersecurity incident response
NCIIPC	Protection of Critical Information Infrastructure
AERB	Nuclear safety regulator
Department of Atomic Energy (DAE)	Overall policy and administration

Why is the Incident Significant?

- Highlights vulnerabilities in **third-party contractors and supply chains**.
- Demonstrates that cyberattacks increasingly target **critical infrastructure**.
- Raises concerns regarding protection of engineering and operational data.
- Emphasizes the need for stronger cybersecurity despite no breach of reactor systems.

Challenges

- Third-party vendor vulnerabilities.
- Ransomware attacks on critical infrastructure.
- Protection of sensitive engineering data.
- Continuous monitoring of cyber threats.

Way Forward

- Strengthen cybersecurity standards for contractors and vendors.
- Conduct regular cyber audits and penetration testing.
- Adopt Zero Trust Architecture for critical infrastructure.
- Improve coordination among NPCIL, CERT-In and NCIIPC.
- Enhance cyber resilience through continuous monitoring and incident response.

UPSC Prelims MCQ

Q. With reference to the Kudankulam Nuclear Power Plant (KKNPP), consider the following statements:

1. It uses Russian-designed VVER Pressurised Water Reactors.
2. The recent data breach involved the Balance of Plant (BoP) and not the nuclear reactor systems.
3. The Atomic Energy Regulatory Board (AERB) is India's nodal agency for responding to cybersecurity incidents.

Which of the statements given above is/are correct?

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

Answer: (a)

Explanation: Statement 3 is incorrect. **CERT-In** is the national nodal agency for cybersecurity incident response, while **AERB** regulates nuclear safety.

UPSC Mains Question (10 Marks)

Cybersecurity has become an essential pillar of national security in the nuclear energy sector. Discuss the significance of the recent Kudankulam Nuclear Power Plant data breach and suggest measures to strengthen cyber resilience of India's critical infrastructure. (150 words)

2.Parliament Set to Consider Key Legislative Reforms: FCRA Amendment & Other Bills

Why in News?

During the **Monsoon Session of Parliament**, the Government is expected to introduce and consider several important Bills, including amendments to the **Foreign Contribution (Regulation) Act (FCRA)**, the **Prevention of Insults to National Honour Act**, judicial reforms, and higher education governance.

Key Bills in the Monsoon Session

Bill	Objective
Prevention of Insults to National Honour (Amendment) Bill, 2026	Extend legal protection to Vande Mataram
Foreign Contribution (Regulation) Amendment Bill	Strengthen regulation of foreign funding
Viksit Bharat Shiksha Adhasthan Bill, 2025	Establish a single higher education regulator

Registration of Births and Deaths (Amendment) Bill	Strengthen delayed registration provisions
Supreme Court (Number of Judges) Amendment Bill	Increase the sanctioned strength of Supreme Court judges
MSME Development (Amendment) Bill	Improve the MSME regulatory framework
Income Tax (Amendment) Bill	Amend provisions of direct taxation

Foreign Contribution (Regulation) Act (FCRA)

What is FCRA?

The **Foreign Contribution (Regulation) Act, 2010** regulates the **acceptance and utilisation of foreign contributions** by individuals, associations and NGOs to ensure that foreign funds are **not used against India's sovereignty, public interest or national security**.

Particular	Details
Original Act	FCRA, 1976
Present Law	FCRA, 2010
Implementing Ministry	Ministry of Home Affairs (MHA)
Objective	Transparency and regulation of foreign funding

Major Features of the Proposed Amendment

Registration & Compliance

- State- and activity-specific registration.
- Mandatory filing of **Form FC-6F** by existing FCRA organisations.
- Registration linked to approved activities.

Financial Regulations

- Foreign contribution to be received through the designated **SBI New Delhi FCRA Account**.
- Administrative expenditure capped at **20%** of foreign contribution.
- Stricter penalties for misuse of funds.

Transparency Measures

- Mandatory disclosure of:
 - Official website.
 - Social media accounts.
 - Publications.
- Uniform definition of **Key Functionary**.

Operational Restrictions

- Restrictions on organisations having foreign nationals as key functionaries (subject to Government approval).
- Minimum utilisation requirements for renewal of registration

Who Cannot Receive Foreign Contribution?

The following are prohibited under the FCRA:

- Election candidates
- Political parties
- Members of Parliament and State Legislatures
- Judges
- Government servants/Public servants
- Journalists, editors and publishers of newspapers

Prevention of Insults to National Honour (Amendment) Bill, 2026

Proposed Amendment

The Bill seeks to amend the **Prevention of Insults to National Honour Act, 1971** to make **intentional insult, obstruction or disruption during the singing of *Vande Mataram*** a punishable offence.

Prevention of Insults to National Honour Act, 1971

The Act currently protects:

- **National Flag**
- **Constitution of India**
- **National Anthem**

The proposed amendment extends similar protection to the **National Song – Vande Mataram**.

About Vande Mataram

Particular	Details
Composer	Bankim Chandra Chattopadhyay
First Published	<i>Anandamath</i> (1882)
National Song Status	Adopted on 24 January 1950
Official Status	National Song of India

Proposed Amendment

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Other Important Bills

Viksit Bharat Shiksha Adhasthan (VBSA) Bill, 2025

- Proposes a **single higher education regulator**.
- Intended to replace bodies such as **UGC** and **AICTE**.
- Seeks to implement reforms envisioned under **NEP 2020**.

Registration of Births and Deaths (Amendment) Bill

- Strengthens provisions relating to delayed registration.
- Supports the development of a robust national digital database of births and deaths.

Supreme Court (Number of Judges) Amendment Bill

- Proposes increasing the sanctioned strength of Supreme Court judges to reduce pendency and improve judicial efficiency.

Way Forward

- Ensure that FCRA reforms balance **national security** with the legitimate functioning of civil society.
- Simplify compliance through digital governance and transparent procedures.
- Promote institutional reforms in education and the judiciary.
- Ensure that legislative changes uphold constitutional values while strengthening governance.

UPSC Prelims MCQ

Q. With reference to the Foreign Contribution (Regulation) Act (FCRA), consider the following statements:

1. The FCRA is administered by the Ministry of Home Affairs.
2. Political parties and election candidates are prohibited from receiving foreign contributions under the Act.

3. The Act seeks to regulate foreign contributions to ensure they are not used against national interest.

Which of the statements given above is/are correct?

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) **1, 2 and 3**

Answer: (d)

UPSC Mains Question (10 Marks)

The Foreign Contribution (Regulation) Act seeks to balance national security with the functioning of civil society organisations. Discuss the objectives of the FCRA and examine the implications of the proposed amendments for transparency, accountability and democratic governance. (150 words)

3.Drones in Tuberculosis Diagnosis: ICMR's i-DRONE Initiative

Why in News?

An ICMR study conducted in Telangana has shown that using **drones to transport tuberculosis (TB) samples** significantly reduces diagnosis time and cost, improving access to healthcare in remote areas and strengthening India's TB elimination efforts.

Key Highlights

Particular	Details
Conducted by	Indian Council of Medical Research (ICMR)
Initiative	i-DRONE
Study Area	Telangana
Major Finding	Drones reduced TB diagnosis time by 60% and cost by 99%
Diagnosis Time	Reduced from 16.6 days to 6.9 days
Diagnosis Cost	Reduced from ₹9,451 to ₹91

What is the i-DRONE Initiative?

The **i-DRONE (ICMR's Drone Response and Outreach in North East)** initiative was launched to use **drone technology for transporting medical supplies, vaccines, blood samples and diagnostic specimens** to inaccessible regions.

Initially introduced during the **COVID-19 pandemic**, it is now being expanded for **TB diagnosis and other public health services**.

How Does it Work?

A **Hub-and-Spoke Model** is followed:

- Patients submit **sputum samples** at nearby **Sub-Centres** or **Primary Health Centres (PHCs)**.
- Drones transport samples to molecular diagnostic laboratories.
- Test reports are generated quickly and sent back to health facilities.

This minimizes delays caused by poor road connectivity and difficult terrain.

Major Findings of the Study

Indicator	Before Drones	After Drones
Average Diagnosis Time	16.6 days	6.9 days
Average Cost per Diagnosis	₹9,451	₹91
Next-day Test Results	1.5%	76.3%
Reports Delayed Beyond 2 Days	92.2%	16.3%

Benefits of Drone-Based Healthcare

- Faster diagnosis and treatment initiation.
- Lower healthcare costs.
- Better access in remote and tribal areas.
- Reduced patient travel and wage loss.
- Improved disease surveillance and sample transport.
- Supports digital and technology-enabled healthcare delivery.

National Tuberculosis Elimination Programme (NTEP)

About NTEP

The **National Tuberculosis Elimination Programme (NTEP)** is India's flagship programme for TB control and elimination.

Particular	Details
Earlier Name	Revised National Tuberculosis Control Programme (RNTCP)
Renamed	2020
Ministry	Ministry of Health & Family Welfare
Goal	Eliminate TB in India
Global Target	SDG Target – 2030
India's Target	2025 (missed)

Objectives

- Reduce **TB incidence by 80%** (from 2015 levels).
- Reduce **TB deaths by 90%**.
- Eliminate catastrophic expenditure for TB patients.

Key Components of NTEP

Component	Description
Rapid Molecular Diagnostics	CBNAAT, TrueNat
Universal Drug Susceptibility Testing	Detect drug-resistant TB
DOTS Strategy	Ensures treatment adherence
Ni-kshay Portal	Digital TB patient management
Ni-kshay Poshan Yojana	Direct Benefit Transfer (DBT) for nutritional support
Ni-kshay Mitra	Community support for TB patients
AI-based Screening	Cough analysis and chest X-ray interpretation
i-DRONE	Drone transport of diagnostic samples

Challenges

- India accounts for about **one-fourth of the global TB burden**.
- Delayed diagnosis in remote regions.
- Drug-resistant TB (MDR/XDR-TB).

- Malnutrition and poverty.
- Social stigma leading to delayed treatment.

Way Forward

- Expand drone-based sample transport nationwide.
- Strengthen molecular diagnostic infrastructure.
- Increase community awareness and early screening.
- Integrate AI and digital health technologies into TB surveillance.
- Improve nutrition and social support for TB patients through schemes like **Ni-kshay Poshan Yojana**.

UPSC Prelims MCQ

Q. With reference to the National Tuberculosis Elimination Programme (NTEP), consider the following statements:

1. It was formerly known as the Revised National Tuberculosis Control Programme (RNTCP).
2. The i-DRONE initiative is being used to transport TB diagnostic samples in remote areas.
3. India's target to eliminate tuberculosis was set five years ahead of the global Sustainable Development Goal target.

Which of the statements given above is/are correct?

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

Answer: (d)

UPSC Mains Question (10 Marks)

Technology is transforming public healthcare delivery in India. Discuss the role of drone technology in strengthening tuberculosis diagnosis and examine its significance in achieving the objectives of the National Tuberculosis Elimination Programme (NTEP). (150 words)

4.White Rabbit Technology and India's "One Nation, One Time" Initiative

Why in News?

Union Minister **Pralhad Joshi** inaugurated the **White Rabbit Technology-based Indian Standard Time (IST) Distribution Demonstration Network** at Jakkur, Bengaluru. The initiative aims to provide a **highly precise, secure and indigenous time synchronization network** under the vision of "**One Nation, One Time.**"

Key Highlights

Particular	Details
Initiative	Indian Standard Time (IST) Distribution Demonstration Network
Technology Used	White Rabbit Technology
Vision	One Nation, One Time
Location	Jakkur, Bengaluru
Nodal Agency	Legal Metrology Division, Ministry of Consumer Affairs
Major Partners	National Physical Laboratory (NPL), ISRO, BSNL, SEBI

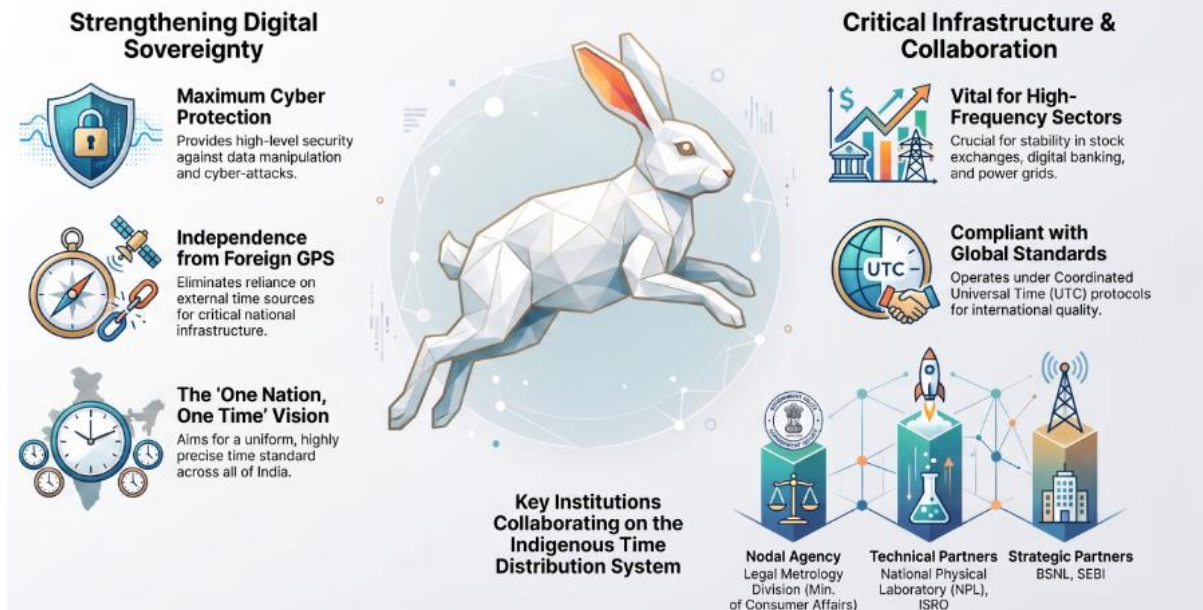
What is White Rabbit Technology?

White Rabbit (WR) is an **open-source, ultra-precise time synchronization technology** developed by **CERN** that enables synchronization of clocks across a network with **sub-nanosecond (less than one-billionth of a second) accuracy** using standard Ethernet infrastructure.

Key Features

- Synchronization accuracy below **1 nanosecond**.
- Operates over standard Ethernet networks.
- Combines **Synchronous Ethernet (SyncE)** and **IEEE 1588 Precision Time Protocol (PTP)**.
- Supports secure and deterministic time distribution.
- Scalable for large, distributed networks.

One Nation, One Time: India's 'White Rabbit' Time Revolution



How Does White Rabbit Work?

Technology	Function
Synchronous Ethernet (SyncE)	Synchronizes clock frequency across the network
IEEE 1588 Precision Time Protocol (PTP)	Synchronizes time between devices
Two-Way Time Transfer	Measures transmission delays for highly accurate timing
Hardware Time Stamping	Improves synchronization precision

What is the "One Nation, One Time" Initiative?

The initiative seeks to establish a **single, secure and precise Indian Standard Time (IST)** across all sectors by eliminating dependence on foreign timing sources such as **GPS**.

Objectives

- Ensure uniform national time synchronization.
- Strengthen digital sovereignty.
- Improve cybersecurity of critical infrastructure.
- Enhance accuracy in digital transactions and communication.

- Support future digital governance.

Significance

- Reduces dependence on foreign timing systems like GPS.
- Strengthens national security and cyber resilience.
- Supports Digital India and critical infrastructure.
- Improves reliability of digital governance.
- Enables precision technologies such as AI, IoT and Industry 4.0.

Way Forward

- Expand the IST distribution network nationwide.
- Integrate White Rabbit Technology across all critical infrastructure sectors.
- Promote indigenous timing technologies under **Atmanirbhar Bharat**.
- Strengthen collaboration among NPL, ISRO, BSNL and industry stakeholders.
- Develop national standards for secure time synchronization.

UPSC Prelims MCQ

Q. With reference to White Rabbit Technology, consider the following statements:

1. It provides sub-nanosecond time synchronization over standard Ethernet networks.
2. It was originally developed at CERN for synchronizing particle accelerators.
3. India's "One Nation, One Time" initiative seeks to reduce dependence on foreign time sources such as GPS.

Which of the statements given above is/are correct?

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) **1, 2 and 3**

Answer: (d)

UPSC Mains Question (10 Marks)

Accurate time synchronization is emerging as a critical component of digital infrastructure. Discuss the significance of White Rabbit Technology and evaluate how

the "One Nation, One Time" initiative can strengthen India's digital sovereignty, cybersecurity and critical infrastructure. (150 words)

5.Vikram-1: India's First Private Orbital Launch Vehicle

Why in News?

Skyroot Aerospace is set to launch **Vikram-1**, India's first privately developed **orbital launch vehicle**, from the **Satish Dhawan Space Centre (Sriharikota)** under the mission "**Aagaman**." The mission marks a significant milestone in India's growing private space ecosystem.

Key Highlights

Particular	Details
Developer	Skyroot Aerospace
Mission	Aagaman
Launch Site	SDSC-SHAR, Sriharikota
Target Orbit	450 km Low Earth Orbit (LEO)
Payload Capacity	Up to 350 kg
Significance	India's first private orbital launch attempt

About Vikram-1

- **Four-stage small-lift launch vehicle** developed by Hyderabad-based Skyroot Aerospace.
- **Named after Dr. Vikram Sarabhai**, the father of the Indian space programme.
- **Carbon-composite structure** reduces weight and improves efficiency.
- **Three solid-fuel stages and one liquid-fuel upper stage** enable precise orbital insertion.
- **3D-printed engines and modular avionics** enhance performance and reduce manufacturing time.

Mission Objectives

- **Validation of indigenous orbital launch technology** through the maiden flight.

- **Technology demonstration payloads** from Grahaa Space, Cosmoserve, DCubed and Skyroot.
- **Collection of flight performance data** for future commercial launches.
- **Development of regular launch capability** for small satellites.



Significance

- Major milestone in India's private space sector, enabling private companies to undertake orbital launches.
- Expansion of commercial launch services for the rapidly growing small satellite market.
- Strengthening of Atmanirbhar Bharat through indigenous launch vehicle technology.
- Enhanced private sector participation complementing ISRO's space programme.
- Improved global competitiveness in the commercial space launch industry.

Challenges

- High development and launch costs associated with orbital missions.
- Need for repeated mission success to establish commercial credibility.
- Strong international competition from established launch providers.
- Expansion of launch infrastructure to support increasing private missions.

Way Forward

- **Greater collaboration between ISRO and private startups** for technology sharing.
- **Supportive regulatory framework** through IN-SPACe for commercial launches.
- **Increased investment in indigenous space technologies** and manufacturing.
- **Development of a robust commercial launch ecosystem** to capture global market opportunities.

UPSC Prelims MCQ

Q. Consider the following statements regarding Vikram-1:

1. It is India's first privately developed orbital launch vehicle.
2. It has been developed by Skyroot Aerospace.
3. It can place payloads of up to 350 kg into Low Earth Orbit.

Which of the statements given above is/are correct?

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) **1, 2 and 3**

Answer: (d)

UPSC Mains Question (10 Marks)

Discuss the significance of the Vikram-1 mission in promoting private sector participation and strengthening India's commercial space capabilities. (150 words)

