

## ● POLITY

## ● ECONOMICS

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## POLITY

## CBI SENDS TEAMS TO PATNA AND GODHRA FOR NEET CASE PROBE

**CONTEXT:** The CBI is investigating alleged irregularities in the NEET exam, including possible cheating and involvement of public servants, after multiple arrests were made.

**BACKGROUND:** The Central Bureau of Investigation (CBI) is probing alleged irregularities in the NEET exam conducted on May 5 for undergraduate medical admissions. Incidents of paper leaks and cheating have been reported in multiple states, prompting a comprehensive investigation. The CBI has arrested several suspects, including key figures in the organized crime syndicate. The Education Ministry has demanded a thorough probe, including the role of public servants, to ensure the integrity of the examination process.

### CBI INVESTIGATION INTO ALLEGED IRREGULARITIES IN NEET EXAM

**CBI registers case and sends teams to Patna and Godhra.**

The Central Bureau of Investigation (CBI) has registered a case of alleged irregularities in the conduct of the National Eligibility-cum-Entrance Test (NEET) held on May 5. Special teams are being sent to Patna and Godhra where local police cases have already been registered.

### Allegations of irregularities in NEET exam.

A first information report (FIR) filed by the CBI says there were "certain isolated incidents" in a few States during NEET conducted by the National Testing Agency (NTA) in 4,750 centres for over 23 lakh candidates. The Ministry of Education has requested the CBI to conduct a comprehensive investigation into the entire gamut of alleged irregularities, including conspiracy, cheating, impersonation, breach of trust, and destruction of evidence by candidates, institutes, and middlemen.

### Investigation into arrested individuals in Patna.

The Economic Offences Unit of the Bihar Police picked up six more people from Deoghar in Jharkhand for their involvement in the alleged paper leak. They suspect that Sanjeev Mukhiya, a resident of Nalanda in Bihar, is the kingpin. He had earlier been arrested on the charge of leaking the paper for a constable recruitment exam conducted by the Bihar Public Service Commission in 2016.

### Investigation into alleged cheating at Godhra test centre.

Another case of alleged cheating at a Godhra test centre, in which six people have been arrested, is being investigated by the Gujarat police, but is likely to be taken over by the CBI.

### ACTION TAKEN BY THE GOVERNMENT :

On Wednesday, Education Minister Dharmendra Pradhan

had acknowledged that the back-to-back paper leaks were an institutional failure of the NTA, whose chief has now been removed.

A seven-member committee of experts has already been set up by the government to examine the matter and make recommendations on the structure and functioning of the NTA.

The government has also notified the Public Examinations (Prevention of Unfair Means) Act, 2024, and will soon come up with "stringent" rules to prevent unfair practices.

**CONCLUSION:** The CBI's investigation into the NEET irregularities, alongside stricter government regulations, aims to restore trust in the medical entrance exam and ensure a fair playing field for all future applicants.

## ENVIRONMENT

## TRIBAL AFFAIRS MINISTER PROMISES TO LOOK INTO FOREST CLEARANCES FOR ₹72,000-CR. GREAT NICOBAR PROJECT

**CONTEXT:** The Tribal Affairs Minister in India will look into the legality of forest clearances for a large infrastructure project on Great Nicobar Island that has raised concerns about tribal rights and environmental impact.

### NEWS IN BRIEF

The Tribal Affairs Ministry will review forest clearance paperwork for a ₹72,000 crore project on Great Nicobar Island.

- This comes after concerns raised by the opposition Congress party, the National Green Tribunal (NGT) and the National Commission for Scheduled Tribes (NCST) regarding the environment and tribal rights.
- The project involves building a port, airport, township and power plant on the island, requiring the clearing of 130 sq km of pristine forest.
- The Shompen tribe, classified as Particularly Vulnerable Tribal Group, resides in the project area. The government assures they won't be relocated.
- The NCST is investigating a complaint alleging violation of Forest Rights Act (FRA) in the clearance process.
- The Andaman and Nicobar administration is accused of not recognizing tribal land ownership under FRA before granting clearances.

**CONCLUSION:** The Tribal Affairs Minister's review of the clearances holds the potential to determine the fate of this large-scale project. Its future hinges on whether the concerns regarding tribal rights and environmental impact are adequately addressed.

## POLITY &amp; GOVERNANCE

## PARLIAMENT'S CHANGED BENCH STRENGTH SPELLS MORE HOPE

**CONTEXT:** The upcoming inaugural session of the 18th Lok Sabha on June 24 is marked by significant expectations for more balanced deliberations and governance due to a reduced majority for the Bharatiya Janata Party (BJP) and a stronger opposition presence. This shift, along with changes in parliamentary leadership and processes, offers hope for greater accommodation of opposition viewpoints and improved legislative scrutiny.

### EXPECTATIONS FROM THE 18TH LOK SABHA

- The 18th Lok Sabha is set to commence on June 24, with high hopes for a shift in its working and deliberations. The anticipation arises from the reduced numerical strength of the Bharatiya Janata Party (BJP) and the increased presence of a combined Opposition, led by the Congress, compared to the previous two Lok Sabhas.

### A COALITION GOVERNMENT

- After a decade, India has a coalition government, headed by the leader of the single-largest party and dependent on crucial support from two regional allies, the Janata Dal (United) and the Telugu Desam Party. Though the BJP helmed the National Democratic Alliance government from 2014-24, the current situation is different due to the lack of a comfortable majority.

### MORE SPACE FOR THE OPPOSITION

- The 2024 verdict indicates the need for a stronger Opposition, capable of challenging the governing coalition's policies and programs. The combined Opposition now has over 230 members, while the governing coalition has over 300, tipping the scales in its favor but not overwhelmingly so.

### ANTICIPATION OF GREATER ACCOMMODATION

- The new House's constitution raises hopes for greater accommodation of Opposition concerns. In the past decade, the BJP's majority often resulted in limited space for Opposition voices, with instances of non-acceptance of adjournment notices and discussions on critical issues.

### PERFORMANCE VS. SCRUTINY

- The government's focus on legislative productivity often led to a lack of adequate scrutiny and debate, causing contention with the Opposition. The norm of subjecting proposed legislation to parliamentary oversight by committees became scarce.

### IMPORTANCE OF PARLIAMENTARY COMMITTEES

- Three decades ago, Parliament expanded the committee system to allow non-partisan and dispassionate deliberation on Bills, offering recommendations to fine-tune legislation. Committees' work, including examining issues and hearing suggestions from domain experts, is crucial for comprehensive law-making.

### CONTROVERSIAL LEGISLATION

- The Opposition cited the three controversial farm laws, cleared without committee referral, leading to protests and their eventual withdrawal. The missed opportunity for committee examination and consultation highlights the need for robust parliamentary oversight.

### PARLIAMENTARY CONVENTIONS AND PRACTICES

- Parliament follows separate Rules of Procedure and Conduct for both Houses, along with time-honored conventions. For instance, in Rajya Sabha, members can seek clarifications on Minister's suo motu statements.

### QUESTION HOUR

- Question Hour is a unique practice where Ministers respond to Members' questions, reflecting the extent of subject knowledge. The Prime Minister's lack of intervention in the last 10 years contrasts with past practices of addressing Parliament after foreign travels.

### ELECTION OF THE SPEAKER AND DEPUTY SPEAKER

- The first test of the new Lok Sabha will be the election of the Speaker, followed by the election of the Deputy Speaker, a constitutional post vacant during the 17th Lok Sabha. The Opposition expects the Deputy Speaker position to be offered to it, citing tradition.

### OPPORTUNITY FOR CRITICAL EVALUATION

- The new session will allow the Opposition to critically evaluate government policies and programs during the President's Address and the ensuing debate on the Motion of Thanks. This debate provides an opportunity to analyze issues without being limited to specific topics.

### CONSENSUS BUILDING

- Rashtriya Swayamsevak Sangh chief Mohan Bhagwat emphasized consensus building, suggesting the Opposition should be viewed as political opponents, not adversaries.

### POINTS OF FRICTION

- In the run-up to the inaugural session, friction arose between the governing coalition and the Opposition over shifting the statues of Mahatma Gandhi and B.R. Ambedkar and the appointment of BJP's Bhartruhari Mahtab as pro tem Speaker. The Congress objected to these decisions, but the Speaker and Parliamentary Affairs Minister dismissed the objections, urging adherence to time-honored traditions.

### THE PATH FORWARD

- The Parliamentary Affairs Minister's outreach to the Leader of the Opposition indicates a willingness to follow traditions. Both the governing coalition and the Opposition must maintain civility in debates and use parliamentary tools effectively to

ensure a productive and balanced legislative process.

**CONCLUSION:** The changed dynamics of the 18th Lok Sabha, marked by a more balanced representation, offer a promising opportunity for robust legislative scrutiny and meaningful debate. Both the governing coalition and the Opposition must prioritize cooperation and civility to ensure effective governance and address the nation's pressing issues.

**POLITY & GOVERNANCE**

## INDIAN RAILWAYS AND SAFETY CHALLENGES

**CONTEXT:** A recent train accident in India raises questions about safety measures and railway management practices.

### The Need for Enhanced Railway Safety Measures

#### Issues in Information Management and Communication

- The Chairperson of the Railway Board prematurely blamed the container train crew's disregard of signals and incorrectly stated that both crew members had died.
- Slow rollout of Kavach, an indigenous signalling system, is attributed to limited capacity in the supporting industry, which the Indian Railways must address by encouraging investment in capacity building.

#### Implementation of Safety Systems

- The Railways decided to adopt Kavach after extensive trials but have faced slow execution, missing targets for completion on the Delhi-Howrah and Delhi-Mumbai sections.
- Recommendations from the CRS' report on the Vizianagaram train accident emphasize prioritizing Kavach implementation in Automatic Signalling territories and faster installation in locomotives and trains.

#### Overstaffing and Critical Safety Categories

- Indian Railways is overstaffed, yet safety-critical categories such as loco crew, train manager, station master, pointsman, and signal maintainer face intense continuous work.
- Nearly 20,000 vacancies for loco pilot/assistant loco pilot positions exist, but only 5,658 heads were initially recruited earlier this year. This was later revised to 18,799 heads after the recent accident highlighted the issue.

#### Frequency of Similar Incidents

- The enquiry needs to determine if the accident was an aberration or if similar near misses are commonplace in the affected section, indicating a grave management failure.

#### Use of AI-Enabled Applications

- Inaction in employing AI-enabled applications to improve safety post mortems and provide actionable alerts is a concern.
- Extensive digital data from station data loggers and microprocessors on locomotives and trains can be effectively managed by AI to filter out irregularities and highlight grave issues to the top of railway management.

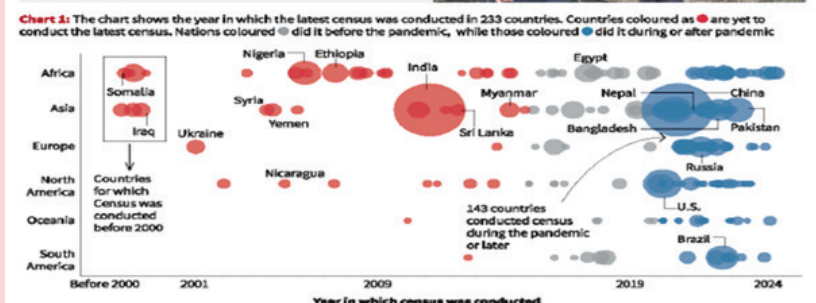
**CONCLUSION**

The enquiry report should delve into managerial issues to chart a clear path toward a safe, accident-free Indian Railways.

**POLITY & GOVERNANCE**

## INDIA AMONG A SELECT FEW COUNTRIES THAT HAVE NOT CONDUCTED THE CENSUS

**CONTEXT:** India has not conducted its census since 2011, causing issues for allocating resources and planning welfare schemes.



**Table 2:** Surveys that need census data to determine their samples and some schemes that require updated population figures

Name	Use of census
Consumption survey	The sampling frame for rural sector is the list of villages as per Census 2011
National Family Health Survey	The 2011 census served as the sampling frame for the selection of villages in rural areas
PLFS	List of 2011 population census villages constituted the rural sampling frame
Sample Registration System	The statistical report uses sample from Census 2011 frame
Household social consumption on education	The total number of sample first stage units (census villages in the rural sector and blocks in the urban sector) were allocated to the States and UTs in proportion to population as per Census 2011
Key Indicators of Social Consumption in India: Health	For the rural areas, the list of 2011 Census villages constituted the sampling frame
National Food Security Act	The Act covers nearly 2/3rd of the country's total population on the basis of estimates done using Census 2011 figures. 75% of rural and 50% of urban population is entitled to receive highly subsidised foodgrains
National Social Assistance Programme	Central assistance to States and UTs under NSAP is determined on the basis of BPL population of the respective States/UTs. Estimated number of beneficiaries are calculated using population figures as per Census 2001 and the poverty ratio determined by the erstwhile Planning Commission in 2004-05
Delimitation of constituencies	The Social Studies Division provides the Scheduled Caste (SC) and Scheduled Tribe (ST) Census figures to the Election Commission for delimitation of constituencies and reservation of seats for the SCs and STs

### INDIA CENSUS DELAY: IMPACT ON WELFARE SCHEMES

#### Census Delay

- Last census conducted in India: 2011
- Decennial counting postponed indefinitely since 2021

#### Importance of Census Data

- Allocating resources for welfare schemes (e.g., schools for tribal children, Public Distribution System)
- Identifying beneficiaries for various programs

#### Reasons for Delay (Government Stated)

- COVID-19 pandemic

#### Comparison with Other Countries

- India among only 44 of 233 nations that haven't conducted a recent census
- Many countries (143) conducted censuses after March 2020 (peak of COVID-19)

#### Examples of Impacted Programs

Sample Surveys: Consumption survey (2022-23), National Family Health Survey (2019-21) relied on 2011 census data

Welfare Schemes: National Family Security Act (food grains) using outdated figures, potentially excluding millions

### Impact on Specific Schemes

Eklavya Model Residential Schools (EMRS): Targeting schools in blocks with high tribal population (based on 2011 data) may miss deserving areas or allocate schools to areas that no longer qualify.

**CONCLUSION:** The lack of a recent census creates roadblocks for efficient resource allocation and equitable distribution of benefits, hindering India's social welfare programs.

## POLITY & GOVERNANCE

# WHAT ARE THE DUTIES OF A SPEAKER?

**CONTEXT:** The roles, duties, and impartiality of the Speaker and Deputy Speaker in the 18th Lok Sabha, focusing on recent appointments and constitutional guidelines.



### THE GIST

- The President has appointed seven-time MP Bhartruhari Mahtab as the 'Speaker pro tem' of the 18th Lok Sabha.
- Article 94 of the Constitution states that the Speaker of the Lok Sabha shall not vacate his/her office until immediately before the first meeting of the Lok Sabha after its dissolution.
- The Deputy Speaker is an important constitutional officer who steps in during the vacancy or absence of the Speaker.

### Appointment of Speaker pro tem

- **Appointment:** The President has appointed seven-time MP Bhartruhari Mahtab as the 'Speaker pro tem' of the 18th Lok Sabha.
- **Election of Full-time Speaker:** Scheduled for June 26.
- **Deputy Speaker Reports:** The Deputy Speaker position is likely to be offered to an ally of the ruling National Democratic Alliance (NDA), a post traditionally held by the Opposition since the 10th Lok Sabha (1991).

### Role of Speaker pro tem

#### • Constitutional Provision:

- Article 94: The Speaker shall not vacate the office until immediately before the first meeting of the Lok Sabha after its dissolution.
- Article 95(1): If both Speaker and Deputy Speaker positions are vacant, the President appoints a member to perform the duties of the Speaker.

#### • Term and Tradition:

- 'Pro tem' means temporary.
- The term is conventional, found in the 'Handbook on the working of Ministry of Parliamentary affairs.'
- Tradition involves selecting one of the senior-most members, who is then administered the oath by the President.

- **Duties:** Administers the oath of office to other MPs and presides over the election of the full-time Speaker.

### Election of Speaker and Deputy Speaker

#### • Constitutional Basis:

- Article 93: Lok Sabha shall choose its Speaker and Deputy Speaker.

#### • Election Process:

- Speaker: Elected on a date fixed by the President.
- Deputy Speaker: Elected on a date fixed by the Speaker.

- **Historical Note:** All Speakers in independent India have been elected unopposed.

### Role of the Speaker

- **Conduct of Business:** Presides over the Lok Sabha sessions.

#### • Constitutional Functions:

- Certifying a Bill as a Money Bill.
- Deciding on disqualification under the Tenth Schedule for defection.

#### • Referral of Bills:

- Power to refer Bills to Standing Committees.
- Decline in referrals from 71% (2009-14) to 16% (2019-24).

- **Suspension of Members:** Can suspend members for grave disorder for up to five days.

### Conventions

#### • British Example:

- The Speaker resigns from their political party upon election and seeks re-election as 'The Speaker.'
- Demonstrates impartiality.

#### • Indian Practice:

- No Indian Speaker has resigned from their political party upon election.
- Somnath Chatterjee, Speaker of the 14th Lok Sabha, acted independently by not resigning despite party directives.

#### • Deputy Speaker Tradition:

- Since 1991, the post of Deputy Speaker has been offered to the Opposition.
- This tradition was not followed in the 17th Lok Sabha.
- It is suggested that this healthy convention should return in the current Lok Sabha.

## INTERNATIONAL RELATIONS

## IS THE EUROPEAN UNION'S 'CHAT CONTROL' LAW UNDERMINING ONLINE PRIVACY?

**CONTEXT:** The EU's proposed 'chat control' law faces criticism for potentially compromising privacy by enabling mass surveillance through end-to-end encryption breaches.

### Proposal:

- The EU's proposed 'chat control' law aims to combat child sexual abuse online.
- First proposed by the European Commissioner for Home Affairs Ylva Johansson in May 2022.
- The proposal has received significant criticism and opposition from various quarters.

### Opposition and Concerns:

- France, Germany, and Poland have refused to accept a clause allowing mass scanning of private messages by breaking end-to-end encryption.
- Tech companies, trade associations, and privacy experts have vehemently opposed the regulation.
- Interior Ministers of Spain and Ireland have supported the proposal.
- Children's rights advocates have criticized EU leaders for failing to tackle online child sexual abuse effectively.

### Privacy and Security Concerns:

- Scanning end-to-end encrypted messages is controversial as it opens risky backdoors that can be exploited by third parties.
- Tech firms that have attempted to bypass encryption have faced backlash and retreated.
- Apple's NeuralHash feature was abandoned due to privacy concerns and potential misuse by authoritarian governments.
- Erik Neuenschwander, Apple's Director of User Privacy and Child Safety, warned of a slippery slope of unintended consequences and bulk surveillance.

### Similar Legislative Efforts:

- The U.K.'s Online Safety Bill proposed client-side scanning of private messages but was postponed after pushback from WhatsApp and Signal.
- The House of Lords delayed the implementation until it was "technically feasible."
- Current Status of the EU's Chat Control Law:
  - A new draft of the proposal is set to be reviewed on June 30.
  - The draft shifts focus from scanning text messages and audio to targeting shared photos, videos, and URLs.
  - Proposed consent for scanning before encryption is criticized as farcical; refusal results in blocking the user from sending or receiving images, videos, and links.
  - The European Commission published a proposal for a temporary derogation of the E-Privacy Directive against CSAM, set to expire in early August 2024.
  - Plans for extending the derogation for three more years were stalled in February 2024.

**CONCLUSION:** The EU's 'chat control' law faces backlash for privacy risks in combating online child abuse, prompting ongoing debates for a balanced approach.

## ECONOMY

## INDUSTRY SEEKS RETHINK ON CHINESE FDI CURBS AND HIGH IMPORT TARIFFS

**CONTEXT:** Indian electronics industry asks for lower import duties & relaxed FDI rules.

### NEWS In BRIEF

- **High Import Duties Hinder Domestic Manufacturing**
  - Current duties range from 0 to 27.5%, with most components falling between 10-15%.
  - This increases production costs and makes Indian goods less competitive globally.
- **PLI Scheme Needs Improvement**
  - Introduced in 2020, the Production Linked Incentive offers 4-6% fiscal support.
  - Industry argues this is insufficient to offset the cost disadvantages caused by high tariffs.
- **Restrictions on Chinese Investment and Skilled Personnel Hurt Development**
  - Implemented in 2020, these curbs aimed to prevent predatory acquisitions during the pandemic.
  - CII believes they are no longer necessary and discourages investment and technology transfer.
- **India Needs a More Open and Collaborative Approach**
  - The CII report recommends:
    - Lower import duties on electronic components.
    - Relaxed restrictions on FDI, especially from neighbouring countries.
    - Openness to importing technology and skilled labour.
- **Global Benchmarking for Long-Term Success**
  - The report highlights that even leading manufacturers like China rely on imports.
  - India should focus on strategic areas and build a competitive ecosystem through collaboration.

**CONCLUSION:** India's electronics industry urges reforms like lower tariffs and relaxed FDI rules to compete globally.



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## INTERNATIONAL RELATIONS

## AFTER YEARS, RUSSIA APPROVES DRAFT LOGISTICS AGREEMENT TO BE SIGNED WITH INDIA

**CONTEXT:** Russia approves the draft of India-Russia military logistics agreement.

### RUSSIA APPROVES LONG-DELAYED MILITARY LOGISTICS AGREEMENT WITH INDIA

- **Agreement to Streamline Military Cooperation**
  - Draft logistics agreement approved by Russia after years of delay.
  - Will simplify military exercises, training, port visits, and disaster relief efforts.
  - Similar to agreements India has with other countries, including the US.
- **Key Points of the Agreement**
  - Needs to be signed by both India and Russia to come into effect.
  - Valid for five years with automatic renewal unless terminated by either party.
- **Strengthens India-Russia Strategic Partnership**
  - Defence cooperation is a cornerstone of the partnership.
  - Guided by a separate agreement on military technical cooperation (2021-2031).
  - Agreement will further military-to-military interaction and equipment development.
- **Potential Benefits**
  - Expected to be a win-win situation for both countries.
  - Follows similar Navy-to-Navy cooperation agreement being negotiated.
  - Could improve operational efficiency and interoperability for the Indian military.

**CONCLUSION:** This long-awaited agreement simplifies military exchanges and strengthens India-Russia defense ties.

## SCIENCE &amp; TECH

## PUSHPAK, ISRO'S REUSABLE LAUNCH VEHICLE, CLEARS TEST

**CONTEXT:** ISRO's reusable launch vehicle Pushpak successfully completed its final test.

### NEWS IN BRIEF

- **Successful Completion of Test Series**
  - Pushpak, ISRO's winged vehicle, aced its third and final test.
  - This mission demonstrated its autonomous landing capability under challenging conditions.
- **Test Details**
  - Released from an IAF Chinook helicopter at an altitude of 4.5 km.
  - Executed complex maneuvers to achieve a precise horizontal landing at the runway center line.
  - Landing velocity exceeded 320 kmph due to the vehicle's design.
  - Employed a brake parachute and landing gear brakes for deceleration.
- **Significance for Future Missions**
  - Simulates landing conditions for a spacecraft returning from space.
  - Validates advanced guidance algorithms crucial for orbital re-entry missions.
  - Demonstrates ISRO's expertise in critical technologies for reusable vehicles.
- **Reusable Flight Systems**
  - LEX-03 mission reused the winged body and flight systems from LEX-02 without modification.
  - This highlights ISRO's design capabilities for reusing flight systems.
- **ISRO Leadership Commends Team**
  - ISRO Chairman congratulated the team for maintaining their success streak.
  - Director of Vikram Sarabhai Space Centre emphasized the achievement's importance for future missions.

**SIGNIFICANCE:** ISRO's Pushpak aced its final test, paving the way for future reusable launch

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## POLITY AND GOVERNANCE

## ADVISORY ON ORGAN TRANSPLANTATION MAY BE PUT UP AT AIRPORTS

**CONTEXT:** India may display organ transplant advisories at airports for foreign patients.

### INDIA TO RAISE AWARENESS FOR FOREIGN MEDICAL TOURISTS UNDERGOING ORGAN TRANSPLANTS

- **Increased Demand from Foreign Nationals**
  - India's world-class facilities and skilled professionals attract foreigners for organ transplants.
  - Health Ministry aims to sensitize them about the legal framework and protocols.
- **Guidelines for Medical Visas and Organ Donation**
  - Guidelines will be published on the Bureau of Immigration website.
  - Awareness campaigns planned at prominent places in airports.
  - Key requirements include:
    - Medical visa mandatory for organ transplant treatment.
    - Living donors must be 18 years or older.
- **Restrictions on Organ Donation by Indian Citizens to Foreigners**
  - The Transplantation of Human Organs and Tissues Act (1994) regulates organ donation.
  - Indian citizens cannot donate organs to foreigners unless they are near relatives.
    - Near relatives include spouse, parents, children, siblings, and grandparents.
  - Embassy officials from the recipient's country must certify the relationship.

**CONCLUSION:** This initiative aims to ensure informed decision-making and a smooth process for foreign medical tourists seeking organ transplants in India.

## SCIENCE &amp; TECHNOLOGY

## NUCLEAR STUDY PROVIDES MAJOR UPDATE ON PLUTONIUM ISOTOPE FISSION

**CONTEXT:** A new study challenges current models for predicting the energy released during plutonium-240 fission, potentially impacting nuclear reactor design, radiation shielding, and nuclear medicine.

### THE GIST

- A part of the fission energy carried away by neutrons is called the prompt fission neutron spectrum. 'Prompt' stands for neutrons Pu-240 might emit right after it has captured a neutron with the energy to destabilise it
- Pu-240 undergoes spontaneous fission, and emits alpha particles. The isotope is considered a contaminant of weapons-grade plutonium, where its composition by weight is

restricted to under 7%

- Researchers also reported a higher-than-expected rate of second-chance fission of Pu-240. They also reported finding signs of 'a smaller contribution from third-chance fission' but added that this 'was difficult to observe in the data directly'

### NEW STUDY ON PLUTONIUM-240 FISSION CHALLENGES CURRENT MODELS

- **Prompt Fission Neutron Spectrum (PFNS)**
  - Explains a part of the energy released during fission carried away by neutrons.
  - Important for understanding nuclear reactions.
- **Properties of Plutonium-240**
  - Undergoes spontaneous fission and emits alpha particles.
  - Considered a contaminant in weapons-grade plutonium (limited to <7%).
  - Second-chance fission (becomes fissionable after losing a neutron) occurs more frequently than expected.
  - Possible signs of third-chance fission observed.
- **Significance for Nuclear Reactors**
  - India's Prototype Fast Breeder Reactor (PFBR) uses plutonium recovered from fuel containing Pu-240.
  - Understanding Pu-240 behavior is crucial for reactor design and safety.
- **New Findings from U.S. Research**
  - Researchers measured PFNS of Pu-240 using neutrons with higher energy than ever before.
  - Findings showed significant differences between predicted and measured PFNS.
- **Impact on Nuclear Data Libraries**
  - Nuclear data libraries inform research on reactors, radiation shielding, and nuclear medicine.
  - The new study highlights the need to update these libraries with more accurate Pu-240 fission data.
  - JENDL-5.0 library seems to better account for multi-chance fission compared to ENDF/B-VIII.0 and JEFF-3.3.
  - Further refinement of all libraries may be necessary based on these findings.

**CONCLUSION:** This research necessitates updating nuclear data libraries for improved reactor design, radiation shielding, and nuclear medicine applications.



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