



spardhaguru2022



Spardhaguru Current affairs



Spardhaguru1



SpardhaGuru



Spardha.guru



www.spardha.guru



## DRDO & Research & Development

### I. Major Project Approvals and Milestones

#### Sanction for Indigenous AWACS (Netra MK-2):

- **Major Approval:** The Indian government has officially sanctioned a ₹20,000 crore project for the development of the indigenous Airborne Warning and Control Systems (AWACS), named **Netra MK-2**. This is a significant boost to the Indian Air Force's (IAF) surveillance and command capabilities.
- **DRDO's Role:** DRDO is spearheading this ambitious initiative, in collaboration with a consortium of Indian enterprises and Airbus.
- **Platform:** Six **Airbus A321 aircraft**, previously acquired from Air India, will be converted into these advanced AWACS platforms. This marks the first time an Airbus platform is being adapted for such complex military use in India.
- **Advanced Features:** The Netra MK-2 will incorporate state-of-the-art **AESA (Active Electronically Scanned Array) radars with 360-degree coverage**, advanced electronic intelligence (ELINT) and communication intelligence (COMINT) functions, and fully indigenous mission control suites. Adani Defence & Aerospace is leading the industry partnership for mission systems.
- **Timeline:** The project has an approximate timeline of three years, with the first operational aircraft projected for delivery around **2026-27**.
- **Strategic Impact:** This project is a major step towards "Atmanirbhar Bharat" (self-reliant India) in high-end aerospace system development, significantly enhancing India's air defense capabilities and reducing reliance on imported systems like the IL-76 'Phalcon'.

#### Successful High-Altitude Trial of Akash Prime Air Defence System:

- **Achievement:** India successfully conducted high-altitude trials of the indigenously developed **Akash Prime air defence system** in the **Ladakh sector**, at an elevation exceeding 15,000 feet, on July 16, 2025.
- **Upgraded Features:** Akash Prime is an upgraded variant of the Akash Weapon System, now equipped with an **indigenous active Radio Frequency (RF) seeker** for enhanced precision across various weather and terrain conditions.
- **Performance:** The system demonstrated its robust capability by scoring two direct hits on fast-moving aerial targets in the rarified high-altitude atmosphere.
- **Deployment:** This latest version is slated to form the third and fourth regiments of the Akash air defense systems for the Indian Army, bolstering their high-altitude operational requirements.
- **Collaboration:** The successful validation involved Army Air Defence and DRDO, along with Defence PSUs like Bharat Dynamics Limited and Bharat Electronics Limited, and other industry partners.

#### User Trials of Extended Range Anti-Submarine Rocket (ERASR) Completed:

- **Naval Enhancement:** User trials of the **Extended Range Anti-Submarine Rocket (ERASR)** were successfully carried out from INS Kavaratti from June 23 to July 07, 2025.
- **Indigenous Design:** DRDO's Armament Research & Development Establishment (ARDE), Pune, in association with High Energy Materials Research Laboratory and Naval Science & Technological Laboratory, designed and developed ERASR for the indigenous rocket launcher (IRL) of Indian Naval Ships.
- **Features:** ERASR is an indigenous anti-submarine rocket with a twin-rocket motor configuration, and







spardhaguru2022



Spardhaguru Current affairs



Spardhaguru1



SpardhaGuru



Spardha.guru



www.spardha.guru



indigenously developed Electronic Time Fuze, and is designed for high accuracy and consistency across a wide range of requirements.

- **Production Partners:** Bharat Dynamics Limited and Solar Defence & Aerospace Limited are the production partners.
- **Future Impact:** With successful completion of trials, the Indian Navy is expected to induct the ERASR system soon, significantly boosting its anti-submarine warfare capabilities.

## II. Advanced Technology Development

### India's New Hypersonic Missile (ET-LDHCM) under Project Vishnu:

- **Classified Project:** Details have emerged about India's **Extended Trajectory-Long Duration Hypersonic Cruise Missile (ET-LDHCM)**, developed under DRDO's classified **Project Vishnu**.
- **Groundbreaking Capabilities:** This is projected to be the first indigenous weapon capable of maintaining **Mach 8 flight for over 1,000 km**, carrying a 2,000 kg nuclear or conventional payload, and executing maneuvers throughout its trajectory. It's designed to overwhelm existing regional air defense systems.
- **Global Recognition:** This development positions India among a select group of nations with advanced hypersonic missile technology.

### Development of Ultra Long-Range Strike Aircraft (ULRA) Stealth Bomber:

- **Ambitious Project:** There are ongoing plans to develop and field the world's first **12,000 km-class indigenous strategic bomber**, designated the **Ultra Long-Range Strike Aircraft (ULRA)**.
- **Vision:** Envisioned as a stealthy, swing-wing platform, it aims to deliver nuclear or conventional payloads globally without aerial refueling.

- **Design Influence:** The design is reportedly a hybrid drawing inspiration from Russia's Tu-160 "Blackjack" and America's B-21 Raider.
- **Weapon Integration:** Key weaponry includes the BrahMos-NG (a reduced-diameter, 290–450 km supersonic cruise missile) and compatibility for Agni-1P short-range ballistic missiles, laser-guided bombs, and anti-radiation missiles.
- **Strategic Significance:** If successful, ULRA would fundamentally transform India's strategic defense posture, providing global nuclear strike reach, bolstering second-strike capabilities, and offering significant strategic leverage.

### Quantum Technology Advancements (from recent DRDO Newsletter - July 2025):

- **Quantum Technology Research Centre (QTRC):** The Solid State Physics Laboratory (SSPL), Delhi, inaugurated the QTRC on May 27, 2025, to bolster indigenous quantum capabilities for strategic and defense applications.
- **Quantum Secure Communication:** DRDO and IIT-Delhi successfully demonstrated **quantum entanglement-based free-space quantum secure communication over more than 1 km**. This achievement signifies India's entry into a new quantum era, paving the way for applications in quantum cybersecurity, networks, and the future quantum internet. This was achieved through DRDO-Industry-Academia Centre of Excellence (DIA-CoE) initiative.

### Underwater Domain Awareness (UDA):

- **Autonomous Underwater Sonar System:** Naval Physical and Oceanographic Laboratory (NPOL), Kochi, successfully completed the trial of India's first moored autonomous underwater sonar system in the Bay of Bengal in May 2025. This battery-operated, platform-independent system is a significant step towards creating a network of





autonomous acoustic sensor nodes for subsurface target surveillance.

### III. Collaborations and Industry Interface

**Transfer of Technologies (ToTs):** DRDO continues to emphasize technology transfer to Indian industries. Recent data shows over 1,950 ToTs handed over, with 256 Licensing Agreements signed in 2024. DRDO test facilities are also open to industries, with over 18,000 tests conducted for private industries/defence PSUs in the last three years.

#### Defence Acquisition Council (DAC) Approvals (July 3, 2025):

- The DAC cleared 10 capital acquisition proposals worth approximately **₹1.05 lakh crore**, with all procurements sourced **indigenously from Indian companies** under the "Buy (Indian-Indigenously Designed Developed and Manufactured)" category. This includes systems like Armoured Recovery Vehicles, Electronic Warfare Systems, Surface-to-Air Missiles, and Mine Counter Measure Vessels, directly benefiting Indian R&D and manufacturing.

**DRDO Internship Program:** The application window for DRDO's paid internship program for final year Science and Engineering students at DRDL, Hyderabad, closed on July 14, 2025. This program provides exposure to cutting-edge defense research. Separately, NSTL Visakhapatnam also had an internship application deadline on July 20, 2025.

**Engine Partnership for AMCA:** The Gas Turbine Research Establishment (GTRE) under DRDO is currently evaluating proposals from Rolls-Royce (UK) and Safran (France) to co-develop a next-generation 110–130 kN engine for the Advanced Medium Combat Aircraft (AMCA). A decision is expected by the end of

2025, which will be crucial for India's self-sufficiency in aero-engine design.

### IV. Strategic Vision

**2025 as Year of Defence Reforms:** Defence Minister Rajnath Singh previously declared 2025 as the "Year of Defence Reforms," emphasizing DRDO's crucial role in transforming the military into a technologically advanced force. This involves aligning with evolving technologies, increasing private sector collaboration, and involving start-ups in R&D efforts.

**Focus on Defence Exports:** DRDO's advancements are also contributing to India's growing defense exports, with systems like the Pinaka multiple rocket launcher being sold to countries like Armenia.

### MCQs

#### 1. What is the sanctioned budget for the indigenous AWACS (Netra MK-2) project?

- a) ₹10,000 crore
- b) ₹15,000 crore
- c) ₹20,000 crore
- d) ₹25,000 crore

**Correct Answer:** c) ₹20,000 crore

**Explanation:** The text states, "The Indian government has officially sanctioned a major ₹20,000 crore project for the development of the indigenous Airborne Warning and Control Systems (AWACS), named Netra MK-2."

#### 2. Which aircraft model will be converted into the new Netra MK-2 AWACS platforms?

- a) Boeing 737
- b) Airbus A321
- c) Sukhoi Su-30





spardhaguru2022



Spardhaguru Current affairs



Spardhaguru1



SpardhaGuru



Spardha.guru



www.spardha.guru



d) Dornier 228

**Correct Answer:** b) Airbus A321

**Explanation:** The text specifies, "Six Airbus A321 aircraft, previously acquired from Air India, will be converted into these advanced AWACS platforms."

**3. What is the key upgraded feature of the Akash Prime air defence system that enhances its precision?**

- a) Passive Infrared (PIR) seeker
- b) Active Electronically Scanned Array (AESA) radar
- c) Indigenous active Radio Frequency (RF) seeker
- d) Laser guidance system

**Correct Answer:** c) Indigenous active Radio Frequency (RF) seeker

**Explanation:** The text highlights, "Akash Prime is an upgraded variant of the Akash Weapon System, now equipped with an indigenous active Radio Frequency (RF) seeker for enhanced precision..."

**4. From which Indian Naval Ship were the user trials of the Extended Range Anti-Submarine Rocket (ERASR) successfully carried out?**

- a) INS Vikrant
- b) INS Kolkata
- c) INS Kavaratti
- d) INS Shivalik

**Correct Answer:** c) INS Kavaratti

**Explanation:** The text states, "User trials of the Extended Range Anti-Submarine Rocket (ERASR) were successfully carried out from INS Kavaratti..."

**5. Under which classified DRDO project has India's new Hypersonic Missile (ET-LDHCM) been developed?**

- a) Project Agni
- b) Project BrahMos
- c) Project Vishnu

d) Project Shaurya

**Correct Answer:** c) Project Vishnu

**Explanation:** The text mentions, "India's Extended Trajectory-Long Duration Hypersonic Cruise Missile (ET-LDHCM), developed under DRDO's classified Project Vishnu."

**6. What is the projected maximum flight speed of India's new Hypersonic Missile (ET-LDHCM) for over 1,000 km?**

- a) Mach 5
- b) Mach 6
- c) Mach 8
- d) Mach 10

**Correct Answer:** c) Mach 8

**Explanation:** The text states, "This is projected to be the first indigenous weapon capable of maintaining Mach 8 flight for over 1,000 km..."

**7. What is the envisioned strike range for the proposed Ultra Long-Range Strike Aircraft (ULRA) Stealth Bomber?**

- a) 5,000 km-class
- b) 8,000 km-class
- c) 10,000 km-class
- d) 12,000 km-class

**Correct Answer:** d) 12,000 km-class

**Explanation:** The text says, "...field the world's first 12,000 km-class indigenous strategic bomber, designated the Ultra Long-Range Strike Aircraft (ULRA)."

**8. Which DRDO laboratory inaugurated the Quantum Technology Research Centre (QTRC) on May 27, 2025?**

- a) Defence Research and Development Laboratory (DRDL)







spardhaguru2022



Spardhaguru Current affairs



Spardhaguru1



SpardhaGuru



Spardha.guru



www.spardha.guru



- b) Naval Physical and Oceanographic Laboratory (NPOL)  
c) Solid State Physics Laboratory (SSPL)  
d) Gas Turbine Research Establishment (GTRE)

**Correct Answer:** c) Solid State Physics Laboratory (SSPL)

**Explanation:** The text states, "The Solid State Physics Laboratory (SSPL), Delhi, inaugurated the QTRC on May 27, 2025..."

**9. In May 2025, which DRDO laboratory successfully completed the trial of India's first moored autonomous underwater sonar system?**

- a) Armament Research & Development Establishment (ARDE)  
b) Naval Physical and Oceanographic Laboratory (NPOL)  
c) High Energy Materials Research Laboratory (HEMRL)  
d) Naval Science & Technological Laboratory (NSTL)

**Correct Answer:** b) Naval Physical and Oceanographic Laboratory (NPOL)

**Explanation:** The text mentions, "Naval Physical and Oceanographic Laboratory (NPOL), Kochi, successfully completed the trial of India's first moored autonomous underwater sonar system in the Bay of Bengal in May 2025."

**10. What was the approximate total value of capital acquisition proposals approved by the Defence Acquisition Council (DAC) on July 3, 2025, all to be sourced indigenously?**

- a) ₹75,000 crore  
b) ₹90,000 crore  
c) ₹1.05 lakh crore  
d) ₹1.20 lakh crore

**Correct Answer:** c) ₹1.05 lakh crore

**Explanation:** The text notes, "The DAC cleared 10 capital acquisition proposals worth approximately ₹1.05 lakh crore, with all procurements sourced indigenously..."

**11. The Gas Turbine Research Establishment (GTRE) is evaluating proposals from which two international companies to co-develop a next-generation engine for the AMCA?**

- a) General Electric (US) and Pratt & Whitney (US)  
b) Rolls-Royce (UK) and Safran (France)  
c) Sukhoi (Russia) and Mikoyan (Russia)  
d) Lockheed Martin (US) and Boeing (US)

**Correct Answer:** b) Rolls-Royce (UK) and Safran (France)

**Explanation:** The text states, "The Gas Turbine Research Establishment (GTRE) under DRDO is currently evaluating proposals from Rolls-Royce (UK) and Safran (France) to co-develop a next-generation 110–130 kN engine for the Advanced Medium Combat Aircraft (AMCA)."

**12. What year did Defence Minister Rajnath Singh previously declare as the "Year of Defence Reforms," emphasizing DRDO's role?**

- a) 2023  
b) 2024  
c) 2025  
d) 2026

**Correct Answer:** c) 2025

**Explanation:** The text states, "Defence Minister Rajnath Singh previously declared 2025 as the 'Year of Defence Reforms,' emphasizing DRDO's crucial role..."

