DRDO

February 11, 2021
The DRDO is developing technologies for all major defence domains and has been participating in the Aero India exhibition in a big way. The Organisation with its vast defence design and development capability has been working towards Atmanirbhar Bharat and has taken up many policy initiatives to work closely with all stakeholders of the ecosystem.

In news: Host of activities by DRDO during Aero India 2021
Placing it in syllabus: Science & Technology
Dimensions

- Key mandate and divisions of DRDO
- Important programs
- Indigenous Technologies for Atmanirbhar Bharat
- Aero India 2021 and DRDO

Content:

Key mandate and divisions of DRDO:

- **Defence Research and Development Organisation (DRDO)** is the R&D wing of Ministry of Defence, Govt of India
- Its vision is to **empower India with cutting-edge defence technologies** and to **achieve self-reliance** in them.
- It equips Indian armed forces with state-of-the-art weapon systems and equipment in accordance with requirements laid down by the three Services.
- DRDO was formed in 1958 from the amalgamation of the then already functioning Technical Development Establishment (TDEs) of the Indian Army and the Directorate of Technical Development & Production (DTDP) with the Defence Science Organisation (DSO).
- Over the years, it has grown multi-directionally in

terms of the variety of subject disciplines, number of laboratories, achievements and stature.

- Today, DRDO is a network of more than 50 laboratories which are deeply engaged in developing defence technologies covering various disciplines

DRDO's Mission:

- Design, develop and lead to production state-of-the-art sensors, weapon systems, platforms and allied equipment for our Defence Services.
- Provide technological solutions to the Services to optimise combat effectiveness and to promote well-being of the troops.
- Develop infrastructure and committed quality manpower and build strong indigenous technology base.

DRDO works on the following Technology Clusters:

Naval Systems and Materials (NS&M):

- Comprises six laboratories
- provides cutting edge naval and material solutions for the Armed Forces.

Aeronautical Systems (Aero):

- Comprises four labs
- Engaged in the development of state-of-the-art unmanned Air Vehicles, Aero Gas Turbine Engine Technology, Airborne Surveillance Systems, Parachutes, Decelerators and Lighter-than-Air Systems.

Armament & Combat Engineering Systems (ACE):

- focuses on research & development of armaments, explosives, land based combat vehicles & engineering equipment.
- It is also involved in the production of systems through Transfer of Technology (ToT).

Missiles and Strategic Systems (MSS):

- responsible for the design and development of state-of-the-art Missiles and Strategic Systems required for the deterrence and defence of the country

Electronics and Communication Systems (ECS):

- has a mandate to design and develop electronic, electro-optical and laser based sensors and systems.

Life Sciences (LS):

- Focus on optimizing the performance and wellbeing of the human behind the weapon through translational research in life sciences in terms of psychological, physiological and nutritional well-being.
- Responsible for developing life support systems and protection from all conceivable operational hazards.

Micro Electronic Devices, Computational Systems & Cyber Systems (MED & CoS):

- MED focuses on thrust areas and technologies relating to Microwave Tubes, Solid State Electronics including Micro Electronic Device design and manufacturing.
- CoS sub-cluster focuses on systems and technologies relating to Artificial Intelligence, Robotics, Command and Control, Networking, Information and Communication Security, etc.

Important Programs:

Tejas LCA

- The DRDO is responsible for the ongoing **Tejas Light Combat Aircraft**.
- The LCA is intended to provide the Indian Air Force with a modern, fly by wire, multi-role fighter, as well as develop the aviation industry in India.

- The LCA programme has allowed DRDO to progress substantially in the fields of avionics, flight control systems, aircraft propulsion and composite structures, along with aircraft design and development.

Key avionics for the Sukhoi Su-30MKI

- The DRDO provided key avionics for the Sukhoi Su-30MKI programme under the **"Vetrivel" programme**.
- Systems developed by DRDO include radar warning receivers, radar and display computers.
- DRDO's radar computers, manufactured by HAL are also being fitted into Malaysian Su-30s.

Nishant and Lakshya UAV

- The DRDO has also developed two unmanned aerial vehicles – the Nishant tactical UAV and the Lakshya (Target) Pilotless Target Aircraft (PTA).
- The Lakshya PTA has been ordered by all three services for their gunnery target training requirements.
- Efforts are on to develop the PTA further, with an improved all digital flight control system, and a better turbojet engine.
- The Nishant is a hydraulically launched short-ranged UAV for the tactical battle area. It is currently being evaluated by the Indian Navy and the Indian Paramilitary forces as well.

INSAS Rifle

- INSAS (an abbreviation of INdian Small Arms System) is a family of infantry arms consisting of an assault rifle and a light machine gun (LMG).
- The INSAS assault rifle is the standard infantry weapon of the Indian Armed Forces.

Integrated Guided Missile Development Programme (IGMDP)

- The IGMDP was launched by the Indian Government to

develop the ability to develop and design a missile locally, and manufacture a range of missile systems for the three defence services.

- The programme has seen significant success in its two most important constituents – the Agni missiles and the Prithvi missiles, while two other programmes, the Akash SAM and the anti-tank Nag Missile have seen significant orders.

The missiles developed under IGMDP are:

- Short-range surface-to-surface ballistic missile – Prithvi
- Intermediate-range surface-to-surface ballistic missile – Agni
- Short-range low-level surface-to-air missile – Trishul
- Medium-range surface-to-air missile – Akash
- Third generation anti-tank missile – Nag

Indigenous Technologies for Atmanirbhar Bharat:

- India is ironically the second largest arms importer (behind Saudi Arabia) without an indigenous defense manufacturing company listed in the top 20.
- India seeks to maintain regional domination and obtain sufficient firepower to protect its immediate borders. The span of the Indian Ocean Region (IOR) is parallel to the Chinese ambition of the First Island Chain.
- India's desire to develop its domestic defense base reflects two sets of concerns: the desire to be self-reliant and the desire to avoid the high cost of importing weapons.
- As a rising global power, growing a self-reliant India seems logical given its strategic imperatives.
- India should grow its native research and research and development (R&D) base for innovation, since its current capability remains limited to foreign collaboration projects without adequate investment.

Aero India 2021 and DRDO:

- Aero India is a platform for aerospace enthusiasts, prospective defence industries, aspirant start-ups and all other stakeholders to participate and witness the advances in global defence and aerospace fields and interact with many national and international delegations and industries.
- More than thirty laboratories of DRDO connected to aeronautical development exhibited their products and technological achievements in this mega event.

Defence Minister Rajnath Singh released the following documents

- DRDO export compendium
- New Procedure for Design, Development and Production of Military Aircraft and Airborne Stores (DDPMAS)
- document for airworthiness certification,
- Aeronautical Research & Development Board (AR&DB) Golden Jubilee Stamp
- documents on the Journey of the board towards the Golden Jubilee of AR&DB.

The major attraction of DRDO's participation in the event were:

- the flying display of Airborne Early Warning & Control (AEW&C) system,
- Light Combat Aircraft (LCA) Tejas and LCA Navy
- Combat Free Fall System,
- models of Advanced Medium Combat Aircraft (AMCA)
- ABHYAS – High-speed Expendable Aerial Target,
- Twin Engine Deck Based Fighter (TEDBF),
- FCS System for LCA and Aerostat Systems.
- Indian Maritime Simulation System (IMSAS), Air Warfare Simulation System and the Air Defence Simulation System
- full-scale models of various Surface to Air missiles

like, Astra, LRSAM, QRSAM, Air to Air Missile Astra, Anti-Radiation Missile NGARM and Smart Anti Airfield Weapon SAAW

Mould your thought: Write a short note on DRDO and its importance for Atma Nirbhar Bharat

Approach to the answer:

- Introduction
- Write about Mission and Vision of DRDO
- Write briefly about Technology Divisions / achievements
- Write about the importance of indegenous military technology and DRDO’s role
- Conclusion