Enhanced Private Sector Participation

Quantum Jump in Defence Exports

Growth in Defence Production

Enhanced FDI in Defence
ASAT

Strategic deterrent for India’s space peace efforts

4th Country in the world to acquire this capability

Proven India’s Ballistic Defence Capabilities

100% indigenous

Defence Research and Development Organisation

Strategic deterrent for India’s space peace efforts
India Joins GPS (US), GLONASS (Russia), Galileo (EU), BeiDou (China), QZSS (Japan) to have its own navigation system-NAVIC

Availability in several smart phones

Indian Space Research Organisation

NAVIC System on 10,00,000 Transport Vehicles being deployed
AIR SYSTEMS
Powered by Missiles, Rocket and Guns
Operates at 6500 m (with fuel and payload)
100% indigenous Design and Development
Excellent for Deserts (+50° C)
15 ordered
Nearly 300 ALH Manufactured till date
Certified for Military and Civil operations
Flying in 4 countries
Order book over 50
30% cheaper than comparable Helicopters in 5.5 Ton Category

Hindustan Aeronautics Limited
100% Indigenous Design and development

4.5 Generation India’s Star Fighter

Naval compatible version successfully tested

125 LCA under production
Ecosystem of over 100 companies
More than 100 indigenous drones operationally deployed first tech startup

### MULTIPLE COMPANIES : LARGE VARIETY

<table>
<thead>
<tr>
<th>COMPANY NAME</th>
<th>VARIANT</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANADRONE SYSTEMS</td>
<td>MEAT</td>
</tr>
<tr>
<td>ASTERIA AEROSPACE PVT LTD</td>
<td>GENESIS</td>
</tr>
<tr>
<td>DYNAMIC TECHNOLOGIES LIMITED</td>
<td>PATANG UAV SYSTEM HEAVY LIFT DRONE</td>
</tr>
<tr>
<td>GURUTVAA SYSTEMS PRIVATE LIMITED</td>
<td>DRONE SURVEILLANCE SYSTEM</td>
</tr>
<tr>
<td>ideaFORGE TECHNOLOGY</td>
<td>NETRAV3 SWITCH UAV</td>
</tr>
<tr>
<td>NEW SPACE RESEARCH &amp; TECHNOLOGY</td>
<td>HIGH ALTITUDE PSUEDO SATELLITE(HAPS)</td>
</tr>
<tr>
<td>TATA AEROSPACE &amp; DEFENCE</td>
<td>Rakshak VTOL UAV</td>
</tr>
<tr>
<td>ZMotion AUTONOMOUS SYSTEMS</td>
<td>MINI LOITERING AMMUNITION UAV</td>
</tr>
<tr>
<td></td>
<td>SURVEILLANCE VTOL AIRCRAFT</td>
</tr>
<tr>
<td></td>
<td>SURVEILLANCE QUADCOPTER</td>
</tr>
<tr>
<td>RAPHE mPhibr</td>
<td>MULTIPLE VARIANTS</td>
</tr>
</tbody>
</table>
MISSILES
BRAHMOS

World’s fastest cruise missile

MAC 3

Sub Sea, Sea, Land and Air versions

Indo Russian collaboration

MAC 3

supersonic

Brahmos Aerospace Private Limited
World's most diverse Missile development capability

A MISSILE FOR EVERY SITUATION

<table>
<thead>
<tr>
<th>NAME</th>
<th>SITUATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Akash</td>
<td>Short Range Surface to Air missile for engaging Multiple Targets in Group or Autonomous Mode with ECCM features.</td>
</tr>
<tr>
<td>ASTRA</td>
<td>Beyond Visual Range (BVR) class Air-to-Air missile with all weather day and night capability.</td>
</tr>
<tr>
<td>NAG</td>
<td>Third-generation Anti-Tank Guided Missile with top attack capabilities.</td>
</tr>
<tr>
<td>Man-Portable Anti-Tank Guided Missile</td>
<td>‘Soft’ launch with state-of-the-art IIR seeker.</td>
</tr>
<tr>
<td>QRSAM</td>
<td>Short Range Surface to Air missile designed to protect moving armoured columns from aerial attacks.</td>
</tr>
<tr>
<td>Helina</td>
<td>Third generation fire and forget class Anti-Tank Guided Missile mounted on the Advanced Light Helicopter (ALH).</td>
</tr>
</tbody>
</table>

Over 10,000 missiles per year manufacturing capability

Ecosystem of more than 750 MSMEs
LAND SYSTEMS
ARTILLERY: GUNS

Worlds most versatile Artillery gun System

Manufacturing capacity of over 250 artillery guns of different types per year

Widest Array ranging from 105 mm to 214 mm

<table>
<thead>
<tr>
<th>Gun</th>
<th>Caliber</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light Field Gun(LFG)</td>
<td>105mm/37Caliber</td>
<td>17 KM</td>
</tr>
<tr>
<td>Dhanush</td>
<td>155mm/45Caliber</td>
<td>38 KM</td>
</tr>
<tr>
<td>Sharang</td>
<td>155mm/45Caliber</td>
<td>39 KM</td>
</tr>
<tr>
<td>K-9 Vajra</td>
<td>155mm/52Caliber</td>
<td>38 KM</td>
</tr>
<tr>
<td>ATAGS</td>
<td>155mm/52Caliber</td>
<td>48 KM</td>
</tr>
<tr>
<td>Pinaka</td>
<td>214 mm</td>
<td>75 KM</td>
</tr>
</tbody>
</table>
155mm/45 calibre towed gun system—Indigenously designed and developed

3 rounds in 30 sec, 12 rounds in 3 minutes

06 manufactured,
12 under manufacture
Contract Awarded - L&T for 100 guns

Tracked howitzer

K9 VAJRA

Larsen & Toubro Limited

100 NOS

155MM/52 CALIBRE
155mm/52calibre - World’s longest range gun system in its class

Designed by DRDO in collaboration with private sector
Precision and Power

Indigenously designed and developed by DRDO

- 80 manufactured
- 12 rockets salvo in 44 seconds
- Incorporating guided system for enhanced accuracy
Capacity to produce over 250 armoured vehicles of all kinds

Designed, developed and manufactured in India

Over 90% Hit probability on Move
SARVATRA BRIDGE SYSTEM

State of art hydraulics system

Multi span capability upto 75 mts

Suitable for heavy military traffic

Indigenously Designed and developed

3 Manufactured 19 under production
AK-203

Latest in AK series
Indo-Russian Collaboration
Catalysing UP defence industrial corridor
7.5 Lakh being produced in India

7.5 Lakh
Explosives

Rapidly growing ecosystem
Explosives for over 30 types of ammunition (5.56mm to 214mm) manufactured in India

100% growth in export year on year
Largest plant to manufacture HMX/HMX Based compositions, exported to over 6 countries

Diverse Manufacturing Capability

<table>
<thead>
<tr>
<th>Explosive</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low explosive</td>
<td>OFB, Economic Explosives, Premier explosives &amp; Gulf oil corporation</td>
</tr>
<tr>
<td>Single, double &amp; triple base propellants</td>
<td>OFB, Premier explosives</td>
</tr>
<tr>
<td>Composite propellants</td>
<td>OFB, Solar Industries &amp; Premier Explosives</td>
</tr>
<tr>
<td>TNT, RDX &amp; HMX</td>
<td>OFB, Solar Industries</td>
</tr>
<tr>
<td>Pyrotechnics</td>
<td>OFB, Solar Industries &amp; Premier Explosives</td>
</tr>
</tbody>
</table>
Bharat Electronics Ltd, has manufactured over 250 SDR-NC radios
Projected demand of USD 10 Billion over 10 Years

MULTIPLE COMPANIES: MANY MODES

<table>
<thead>
<tr>
<th>Company</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRDO/BEL</td>
<td>Vehicular, Manpack and hand held variants with advanced Digital Signal Processor</td>
</tr>
<tr>
<td>Cyient Ltd</td>
<td>Manpack variant developed in partnership with Indian Startup (Saankhya Labs)</td>
</tr>
<tr>
<td>Lekha</td>
<td>Supports customization for different deployment scenarios UHF, L and S-Band</td>
</tr>
<tr>
<td>Big Cat Wireless Ltd</td>
<td>4G Tactical LAN for Army and Navy.</td>
</tr>
</tbody>
</table>
Wide range from “L” band to “Ka” frequency Band for diverse requirements of Armed Forces.

Range from as low as 500 Meters to approx. 500 Kms. for various applications.

Potential to build more than 400 Radars every year.
Air Defence Tactical Control Radar (ADTCR) is used for volumetric surveillance, detection, tracking and friend/foe identification of aerial targets of different types.

Detects very small targets and low flying targets.

Employs Active Phased Array Technology
Development of ruggedized switches and routers Under MAKE IN INDIA program by BEL to meet operational requirements of Armed forces

Installed and commissioned in QRSAM

Shakti- Secure open source processor by RISE group @ IIT Madras

Ajit- A ‘Made in India’ Microprocessor developed @ IIT Bombay through Industry, Academia & Government

Tejas Networks-Indigenously Developed Secure Routers.
NAVAL SYSTEMS
Over 300 Naval/Coast Guard ships built of different class and category

One of the finest Design & Development Capabilities

Modular construction Capability

Over 280 marine products indigenously produced including Air Craft Carrier, Destroyer, Frigates, Corvettes, OPVs, FACs, Submarines
Bids invited for manufacture of 6 Submarines valued at Rs 40,000 cr under strategic partnership model

100% indigenous steel for submarines

Ecosystem supporting over 1500 MSME
India joins USA, UK, Russia, China & Brazil and enters the elite group capable of operating Short Take-Off But Arrested Recovery. Endurance about 7,500 nautical miles.
<table>
<thead>
<tr>
<th>Torpedo Type</th>
<th>Operational Depth</th>
<th>Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced long range Anti-Submarine torpedoes</td>
<td>600m</td>
<td>40 knots</td>
</tr>
</tbody>
</table>

Under production by Bharat Dynamics Limited
CYBER DOMAIN
Artificial Intelligence

AI taskforce lays out a road map for coordinated action for use in Defence

More than 3000 companies with over a Lakh Professionals

India's AI Industry doubles in size at $500 Million

3000 COMPANIES

A LAKH PROFESSIONALS

AI INDUSTRY

ARTIFICIAL INTELLIGENCE

$500 MILLION
Open General License (OGL) implemented for facilitating exports

Avantel Ltd
Boeing India Pvt Ltd
Cylent Ltd
Cummins Technologies India Pvt Ltd
GE India
Goodrich Aerospace Services Ltd
Rolls-Royce India Pvt Ltd
Mercedes-Benz Research & Development India Pvt Ltd
GKN Aerospace Engine Systems India Pvt Ltd
INDUSTRY 4.0

Real time data analysis

Faster decision making

Improved productivity

Higher revenues

Partnership of DGQA, BDL and C-DAC in realizing the Pilot Project as a Make in India initiative.
Over 8000 MSMEs supporting Defence & Aerospace industry
Exporting to over 84 countries
Incentives for MRO to propel components ecosystem
100% FDI on automatic route for most components
FOSTERING INNOVATION & GROWTH THROUGH POLICY

- **Liberalized Industrial licencing**
  - Reduced entry barriers for new entrants in defence sector. Has led to doubling of Defence licenses issued from 215 on 31st March 2014 to 460 till 31st Dec 2019.

- **Simplifying Defence Exports**
  -通过 'No objection Certificate'
  - Simplified granting 'No objection Certificate' for export of defence stores which has resulted in export of Rs.10,745 cr in 2018-19.

- **IDEX framework created to nurture innovations**
  - More than 600 applicants have participated in IDEX’s ‘Defence India Startup Challenge’ and there are 44 winners developing solutions against 14 problem statements.

- **Indigenisation policy**
  - To create an industry ecosystem which is able to indigenize imported components

- **Enabling MSMEs in expanding their base**
  - Initiatives taken to address issues of timely payments like implementation of TReDS in DPSUs.

- **Designing Defence Investor Cell**
  - Defence Investor Cell has been opened in DDP to address issues being faced by vendors.

- **New scheme for providing Defence Testing Infrastructure for Private Industry**
  - Test facilities available with Government agencies have been made available to private sector to assist them in design & development of defence systems.

- **Reforms in Offset Policy**
  - Offset guidelines made flexible by allowing change of Indian Offset Partners (IOPs) and offset components, even in signed contracts

- **Mission Raksha Gyanshakti to encourage IPR for self-reliance in defence**
  - Aims at stimulating and promoting creativity and innovations leading to large scale creation of IP assets. There has been a 5 times jump in IPR filings between 2016 and 2020.

- **Outsourcing of Quality Assurance Functions**
  - Need based outsourcing and sharing of QA workload with Third Party Agencies.

- **Artificial Intelligence in Defence**
  - Defence PSUs and OFB have been advised to develop AI based features linked to their production profile which has led to 25 new AI/technologies under development.

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Leading global supplier of precision-engineered products using Metal injection moulding (MIM) process is headquartered in Bangalore exporting 90% of the produced goods. Produces 3500 varieties of Critical components of Small arms/Rifles and a lead supplier to SIG Sauer, Smith and Wesson, Beretta, Thales

Indo – MIM

Indian Start Up developing Next Generation Mission Technologies for Aerospace & Defence focusing on Artificial Intelligence powered unmanned systems, collective robotics algorithms, operations in GPS denied space, Augmented & Virtual reality interfaces.

Engaged in developing world standard cutting edge technologies for use in futuristic battlefields and has entered into an Agreement with United States Air Force Research Lab for development of Air Launched Swarming for use by Indian and US Air Forces

New Space Research and Technologies

Wheeled Armoured Amphibious Platform (WhAP)

A Make in India” initiative led jointly by VRDE (DRDO) and Tatas being developed for use by the Indian Army

Provides State of art automotive defence mobility by incorporation of all modern features, optimized ergonomics and best-in-class fighting capabilities.

TATA MOTORS

Indigenous Water Jet propulsion system built by L&T meets stringent demands for Naval and Coast guard vessels for littoral operations.

Provides enhanced maneuverability and high speed during shallow water operations through inbuilt steering and braking system.

Waterjet Propulsion System (L&T)