

Feb  
2022

# समाचार पत्रों से चयित अंश Newspapers Clippings

A Daily service to keep DRDO Fraternity abreast with DRDO Technologies, Defence Technologies, Defence Policies, International Relations and Science & Technology

खंड : 47      अंक : 26      08 फरवरी 2022  
Vol. : 47      Issue : 26      08 February 2022



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**Press Information Bureau  
Government of India**

**Ministry of Defence**

*Mon, 07 Feb 2022 4:33PM*

## **DRL, Tezpur**

Defence Research Laboratory, Tezpur is providing vital support to Indian Armed Forces deployed in North Eastern region. Following are some of the significant products developed by DRL, Tezpur:

- Iron Removal Unit (IRU)
- De-arsenification Unit
- DRDO Water testing kit
- DRDO Bio toilet
- High SPF Sunscreen cream
- Herbal room freshener cum mosquito repellent etc.
- Herbal mosquito repellent vaporizer
- Larvicidal floating tablet.

All the work executed in lab is to enrich the Armed Forces and local people. Details of some of the extremely beneficial products along with their prices are as follows:

<b>S No</b>	<b>Product</b>	<b>Price/Unit (in Rs)</b>
1.	Iron Removal Unit (300 L/hr)	53,400/-
2.	Water testing kit	16,500/-
3.	Bio toilet for plain areas	20,000/- to 80,000/-
4.	Bio toilet for low temperature areas	75,000/- to 3,50,000/-

Presently held manpower of DRL, Tezpur, grade-wise, is given below:

<b>S No</b>	<b>Cadre</b>	<b>RE</b>	<b>Held</b>
1.	DRDS	22	21
2.	DRTC	34	21

3.	ADMIN	11	09
4.	ALLIED	24	18
<b>TOTAL</b>		<b>91</b>	<b>69</b>

DRDO is a Central Government Organisation which works under Ministry of Defence. Therefore, no zonal and region wise recruitment is done in DRDO for all grades. In DRDO, recruitment is done centrally through Recruitment and Assessment Centre (RAC) and Centre for Personnel Talent Management (CEPTAM). However, Research Associates (RA) and Research Fellows (RF) are recruited based on lab requirements through advertisement. In 2021, 04 Research Associates (RA) and 08 Research Fellows (RF) were recruited, out of them 01 RA and 03 RFs, respectively, are from NE states.

Following steps are being taken in order to make the lab more impactful and effective:

- Emphasis has been given for surveillance and monitoring of the vectors and vector borne diseases in NE India and development of products for their management.
- DRL, Tezpur has recently been entrusted with additional mandate to develop products and technologies, specific for troops engaged in Jungle Operations in the NE region.
- Thrust has been given to include NGOs and local civil bodies for carrying out activities for development of border areas in NE region through the use of modern agricultural practices.
- Local entrepreneurs and industries are being encouraged for the development of DRL products and technologies, which are useful for NE region.
- Activities have been initiated for wider implementation of Bio toilet technology by PHEs under various state governments in the NE region.

This information was given by Raksha Rajya Mantri Shri Ajay Bhatt in a written reply to Shri Birendra Prasad Baishya in Rajya Sabha on February 07, 2022.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1796167>



Tue, 08 Feb 2022

## IAF's LCA Tejas to show flying skills at Singapore Airshow

***“The single jet performance will bring impressive stunts and manoeuvres to Singapore’s skies,” the airshow organisers, Experia, said on February 7.***

Singapore: The Indian Air Force’s Light Combat Aircraft (LCA) Tejas will be showcasing its flying skills at the Singapore Airshow 2022 being held from February 15 to 18.

“The single jet performance will bring impressive stunts and manoeuvres to Singapore’s skies,” the airshow organisers, Experia, said on February 7.

“The airshow will have eight flying displays and flypasts from four air forces and two commercial companies,” it said. The Tejas aircraft had also participated in the Dubai Airshow in November last year.

Tejas, manufactured by State-run aerospace giant Hindustan Aeronautics Limited, is a single engine and highly agile multi-role supersonic fighter aircraft capable of operating in high-threat air environments.

The aircraft is a potent platform for air combat and offensive air support missions while reconnaissance and anti-ship operations are its secondary roles.

Apart from the IAF LCA, the U.S. military, the Indonesian Aerobatic Team and the Singapore Air Force will put up airshows, the organisers said. Nearly 600 companies will participate as well.

Last seen at the 2018 Singapore Airshow, Indonesia's Jupiter Aerobatic Team, also known as "The Jupiters", will thrill the audiences with their six-plane formations and precision flying.

Returning with two performances this year, the Republic of Singapore Air Force will feature an F-16C fighter jet displaying solo aerobatics and a pair of AH-64D Apache attack helicopters.

The United States Marine Corps' F-35B Lightning II, the world's first short-takeoff, vertical landing stealth fighter, will also be featured at the airshow along with the United States Air Force's B-52 Stratofortress in a fly-by.

"An integral part of the Singapore Airshow, the flying displays are testament to the strong bilateral ties that Singapore has with the participating Air Forces, and brings together attendees from all across the world to interact at this biennial event," said Experia.



Representational image only. | Photo Credit: PTI

Commercial plane watchers can also expect to see demo fly overs by Airbus' A350-1000 and Boeing's wide-bodied B777-9, it said. Members of the public will be able to catch these spectacular display performances via livestream.

Experia Managing Director Leck Chet Lam said, "We are excited to present the much-anticipated flying displays at this year's Singapore Airshow, a key highlight that brings the global aerospace and aviation industry together for this biennial event.

"These stellar performances by our partners and exhibitors are testament to the recovery of the aerospace and aviation industry and we hope they will uplift spirits," he said.

<https://www.thehindu.com/news/international/iafs-lca-tejas-to-show-flying-skills-at-singapore-airshow/article38391631.ece>



Tue, 08 Feb 2022

## GU, DRDO to set up cyber security research centre

*A three-member expert committee was formed that met to formulate objectives and working of the research centre, according to one of the members.*

*By Ritu Sharma*

Ahemadabad: The Gujarat University is setting up a Sardar Vallabhbhai Patel Centre for Cyber security Research (SVP-CCR) in collaboration with the Defence Research and Development Organisation (DRDO), an MoU for which has been signed.

Planned as a centre of excellence, the SVP-CCR will conduct multi-disciplinary scientific and applied research in critical and futuristic technologies related to defence and security. It will be funded by the DRDO with Rs 100 crore for three years, extending its test and evaluation facilities for ongoing research at the centre.

A three-member expert committee was formed that met to formulate objectives and working of the research centre, according to one of the members.

The MoU was signed between both the agencies in October 2021 for the SVP-CCR, which will be set up on the top floor of Gujarat University's upcoming Dr APJ Abdul Kalam Centre for Extension and Research and Innovation (CERI) on its campus.

"The centre will take care of future threats to national security and offer technology to protect systems from insilico cyber attacks," Gujarat University Vice-Chancellor Professor Himanshu Pandya told The Indian Express.

Aimed at collaborative research work in five verticals — IOT, cyber security, malware analysis, cryptocurrency analysis and cyber defence, the centre will engage researchers, faculties, incubators at the GU as well as other institutes, industries, DRDO laboratories and industrial research laboratories. Looking at future requirements, more verticals would be added, with at least 100 researchers working under each vertical, added Pandya.

The DRDO will provide problem statements where students supported by faculty members as principal investigators will work and will be joined by experts and professionals.

The centre will be governed by a Governing Council and projects will be reviewed and evaluated by a Technical Expert Committee (TEC). The guidelines state that any change in the MoU will be made with the recommendation of the Governing Council and subsequent approval from the authorities concerned.



The DRDO will provide problem statements where students supported by faculty members as principal investigators will work and will be joined by experts and professionals.

<https://indianexpress.com/article/cities/ahmedabad/gu-drdo-to-set-up-cyber-security-research-centre-7760634/>

## DRDO on Twitter

A. Bharat Bhushan Babu  
@SpokespersonMoD

Defence Research Laboratory, Tezpur is providing vital support to Indian Armed Forces deployed in North Eastern region. It has developed some significant products. Click on the link below to read the full story:  
[pib.gov.in/PressReleasePa...](http://pib.gov.in/PressReleasePa...)

MINISTRY OF DEFENCE

Ministry of Defence in Parliament  
Question Hour (Rajya Sabha)  
February 07, 2022

**DRL, Tezpur**

Click the link in caption for full story.

6:30 PM · Feb 7, 2022 · Twitter Web App





07 February 2022

## Defence News

## Defence Strategic: National/International

# The Tribune

Tue, 08 Feb 2022

## BrahMos export opens up strategic arena

*The BrahMos missile is the result of a partnership with Russia. It appears that the issues between partners DRDO and Russian rocket design bureau NPO Mashinostroyeniya have been resolved.*

*However, US sanctions can imperil export efforts. The NPO Mashinostroyeniya is a target of CAATSA (Countering America's Adversaries Through Sanctions Act). The US ought to see that a Quad partner is assisting countries threatened by China and look at the bigger picture.*

*By Gurjit Singh (Former Ambassador)*

The recent agreement with the Philippines to supply BrahMos missiles indicates India's emergence as an important player in the Indo-Pacific. India is positioned as a security provider in the Indian Ocean Region (IOR), having worked with Mauritius and the Seychelles to strengthen their capabilities. There were similar efforts involving countries such as Mozambique in the Western IOR. On the eastern side, ASEAN countries have issues with China in the South China Sea (SCS). They are losing control over outlying islands and atolls, and facing growing incursions by Chinese fishing fleets, supported by the Chinese Coast Guard. The Coast Guard is strengthened by a 2021 law which allows it to take lethal action in defence of the waters claimed.

While Malaysia and Brunei have adopted a low-key approach in dealing with China on the issue of disputed islands, Vietnam and the Philippines have suffered. Indonesia is feeling the heat as Chinese incursions into its Exclusive Economic Zone (EEZ) in the Natuna Sea have increased.

India has maritime security cooperation with six ASEAN countries and a strategic partnership with ASEAN as a whole. However, neither ASEAN nor India was keen on developing an anti-Chinese position. With this clarity, cooperation continued, but lacked depth.

India provided a submarine from its fleet to Myanmar in 2020. It was for Myanmar's defence in the Bay of Bengal. India was guided by 'SAGAR' or 'Security and Growth for All in the Region' and its commitment to building capacities in neighbouring countries.

Myanmar is not a contender with China in the SCS. It is Vietnam, Indonesia and Philippines who wish to procure Indian missiles for the defence of their coastline. Through proven BrahMos and Akash, India fitted the bill. For several years, Vietnamese and Indonesian interest was not matched by Indian enthusiasm.

The requirement of fulfilling domestic orders came first. Now, with the determined push to achieve defence exports of \$5 billion, the BrahMos is in the market. The Philippines became its unexpected first customer. Vietnam and Indonesia, who remain interested are waiting in the wings; among the potential buyers are South Africa, Kenya, the UAE and Oman. None of them in the Western IOR are seen in the anti-Chinese mould.



**Potent weapon: The role played by DRDO in developing BrahMos gives India an edge. PTI**

This aspect is important. For several years, India demurred in responding to Vietnamese and Indonesian requests for missiles, perhaps because it was cautious about the Chinese reaction. The Chinese aggression in Ladakh in 2020 and their disregard for extant agreements pertaining to the Line of Actual Control (LAC) reduced India's inhibitions in working with other countries in their national interest.

The ASEAN countries understood that Chinese dominance in the region, achieved through control over the SCS and avoiding progress on the Code of Conduct, curbed their strategic autonomy. Despite Chinese largesse in dealing with the pandemic and BRI support to many ASEAN countries, some of them who are at loggerheads with China in the SCS feel threatened. In the past, the US was the net provider of security, but with its departure, the region was left in a quandary.

Now, as the Quad has visible participation in the Indo-Pacific, ASEAN countries believe that their strategic autonomy allows them to engage beyond China. The only thing they want to avoid is Sino-US rivalry. Therefore, buying defence equipment from India or Japan is considered a safer bet. The Philippines obtained patrol boats from Japan, as did Vietnam; the Philippines' main equipment is of US origin since it was a US treaty partner and it is still ordering more American equipment. India has found the right niche as neither the US nor Japan have missiles which they will provide to ASEAN countries.

Undoubtedly, the role played by the Defence Research and Development Organisation (DRDO) to develop BrahMos, a 292-km-range cruise missile and the best in its class at present, gives India an edge. Newer versions of the BrahMos under testing will increase the range and the speed and take it from a supersonic 2.8 Mach to a hypersonic 5 Mach.

Some ASEAN countries remain interested in the shore-based anti-ship version to defend their coastlines. They do not have the capacity to absorb ship-based, submarine-launched or aircraft-delivered BrahMos; hence, the original BrahMos created by India remains the default option for export.

The then President APJ Abdul Kalam had said that Indian diplomacy and technology had come together to create the Pan-African e-network project for telemedicine and tele-education in Africa. Separately, it had come together with Russia to produce BrahMos. Subsequently, a third diplomatic success was when India joined the Missile Technology Control Regime (MTCR) in 2016 which allowed it to develop missiles up to 300-km range and export them in a responsible manner.

Military diplomacy facilitated the Philippines breakthrough. For consistent exports, BrahMos needs to deal with three aspects and hope that circumstances would not deter it. The cost at about \$2.75 million for a battery is considered high. India compensates by offering a sovereign-backed line of credit (LOC) for defence exports. However, none of the three ASEAN countries availed of



the LOC and have preferred their own budgetary funding, often leading to delays in orders. India should relook the terms of the LOC to make them supportive of exports.

BrahMos is the result of a partnership with Russia. It appears that the issues between partners DRDO and Russian rocket design bureau NPO Mashinostroyeniya have been resolved, clearing the path for exports. However, US CAATSA (Countering America's Adversaries Through Sanctions Act) sanctions can imperil export efforts. The NPO Mashinostroyeniya is a target of CAATSA. The US ought to see that a Quad partner is assisting countries threatened by China and look at the bigger picture rather than its domestic legislation.

Thirdly, the Sino-Russian axis is growing strategically stronger in Northeast Asia, a part of the Indo-Pacific. Though Russia is not active in the South China Sea, it is supportive of Chinese objectives in the region.

The Chinese have so far not reacted to the sale of BrahMos to the Philippines. Caution is advised in dealing with the Russian approach to the export of BrahMos to countries whose main threat is from China. This is another task for Indian diplomacy to manage in a rapidly changing scenario.

<https://www.tribuneindia.com/news/comment/brahmos-export-opens-up-strategic-arena-367937>



Tue, 08 Feb 2022

## UAE seeks SAM, asking about Barak-8 with active RF/IIR seeker

*TEL AVIV, (\$1=3.20 Israeli Shekels) — The United Arab Emirates is in talks with Israel over the possible acquisition of anti-aircraft missile systems, with an interest in the Israeli-Indian Barak-8 surface-to-air missile [SAM], as well as the Iron Dome or Spyder.*

*By Boyko Nikolov*

- *UAE buys Korean surface-to-air missiles reaching Mach 5 speed*
- *UAE wants SAM systems, intercepting at an altitude of 20 km*
- *Top 5 best anti-aircraft missile systems in the World*

The recent airstrikes by missiles and drones on the territory of the UEA by Houthi rebels are one of the reasons why Dubai sought the help of Tel Aviv, the Jerusalem Post reported in its publication. The UAE and Israel are building a relationship of good diplomatic relations after Tel Aviv signed an agreement with four Arab Neighborhood League countries [Bahrain, UAE, Sudan, and Morocco] two years ago. Jordan and Egypt, as Israel's neighbors, have also maintained their diplomacy and maintained good manners since the end of the last century.



Photo credit: Wikipedia

Israel relies on its military-industrial complex, which is a driving force in the country's economy, provides thousands of jobs, and is technologically perhaps the most advanced in the world. The UAE, Pakistan, Algeria, Morocco, and Egypt are some of the countries in the region that are operators of Israeli weapons systems. It is therefore not surprising that Dubai is looking to Tel Aviv, hoping to hold fruitful talks that will satisfy the UAE's national security interests.

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### Why Barak-8 missile?

Barak-8 is an Israeli-Indian surface-to-air missile. It is a product of the engineering cooperative between Israel Aerospace Industries and the Defense Research and Development Organization of India. The two countries are working together to develop Bharat Electronics in India and Rafael Advanced Defense Systems in Israel.

Barak-8 is a completely new development in its field, which after successfully passing several two-state tests, was officially presented in 2016, and in 2017 began its serial production.

Its operational feature is a media range missile for anti-aircraft, helicopters, drones, ballistic missiles, anti-ship missiles, fighters. The missile weighs 275 kg and carries a warhead of 60 kg.

Barak-8 develops a maximum flight speed of Mach 3 and is powered by a two-stage smokeless pulse rocket engine. The characteristic of Barak-8 is that it is deployed very quickly, which is key in the UAE's desire to counter almost immediately an air threat. It can intercept and hit targets up to 150 km.

Barak-8 can be launched from a ship or the ground, and in both cases the launch is vertical. However, one of its advantages, which is important for the UAE, is that Barak-8 has a two-way data connection and active RF / IIR seekers. Ie Barak-8 searches for air targets in two ways – direct communication with the radar transmitter or detection of infrared emissions of the target.

### **Iron Dome or Spyder are also being discussed**

The Iron Dome is the flagship of the Israeli defense industry. This anti-aircraft missile system is designed from Israel's needs in response to regional threats, ie. Iron Dome is designed to deal with threats within a radius of 70 km.

Spyder, unlike the Iron Dome, has an even more limited range, up to 35 km, but is most often used to intercept and destroy flying objects within a radius of 9 to 15 km. However, Spyder can raise an air target at a high altitude – nearly 16 km, as the missile has boosters.

The UAE has already begun to think much more seriously about its air defenses. BulgarianMiliter.com reminded us that just a few days ago Dubai decided to spend nearly \$ 3.3 billion to acquire South Korean surface-to-air missile systems Cheolmae-II. This is a serious missile system whose missiles reach a speed of Mach 5.

The UAE will receive surface-to-air missile systems including missile batteries, a freight vehicle, and a radar system. The production of Cheolmae-II will be carried out by two South Korean companies – the aforementioned Hanwha Defense and LIG Nex1.

<https://bulgarianmilitary.com/2022/02/07/uae-seeks-sam-asking-about-barak-8-with-active-rf-iir-seeker/>



**Press Information Bureau**  
**Government of India**

**Ministry of Defence**

*Mon, 07 Feb 2022 4:31PM*

## **Make in India in Defence Sector**

Many significant projects including 155mm Artillery Gun System 'Dhanus', Light Combat Aircraft 'Tejas', 'Akash' Surface to Air Missile system, INS Kalvari, INS Khanderi, INS Chennai, Anti-Submarine Warfare Corvette (ASWC), Arjun Armoured Repair and Recovery Vehicle, Bridge Laying Tank, Bi-Modular Charge System (BMCS) for 155mm Ammunition, Medium Bullet Proof Vehicle (MBPV), Lakshya Parachute for Pilotless Target Aircraft, Thermal Imaging Sight Mark-II for T-72 tank, Offshore Surveillance Ship, Water Jet Fast Attack Craft, Inshore Patrol Vessel, Offshore Patrol Vessel, Fast Interceptor Boat, Landing Craft Utility, 25T Tugs, etc. have been produced in the country under 'Make in India' initiative of the Government in last few years.

The Government has taken several policy initiatives in past few years under 'Make in India' program and brought reforms to encourage indigenous design, development and manufacture of defence equipment in the country, thereby reducing dependence on imports continuously. These initiatives, inter-alia, include according priority to procurement of capital items from domestic sources under Defence Acquisition Procedure (DAP)-2020; Notification of two 'Positive Indigenisation Lists' of total 209 items of Services and one 'Positive Indigenisation List' of total 2851 items of Defence Public Sector Undertakings (DPSUs), for which there would be an embargo

on the import beyond the timelines indicated against them; Simplification of Industrial licensing process with longer validity period; Liberalisation of Foreign Direct Investment (FDI) policy allowing 74% FDI under automatic route; Simplification of Make Procedure; Launch of Innovations for Defence Excellence (iDEX) scheme involving startups & Micro, Small and Medium Enterprises (MSMEs); Implementation of Public Procurement (Preference to Make in India), Order 2017; Launch of an indigenisation portal namely SRIJAN to facilitate indigenisation by Indian Industry including MSMEs; Reforms in Offset policy with thrust on attracting investment and Transfer of Technology for Defence manufacturing by assigning higher multipliers; Establishment of two Defence Industrial Corridors one each in Uttar Pradesh and Tamil Nadu.

The Government, in the last three years *i.e.* from 2018-19 to 2020-21 and current year till December 2021, has accorded Acceptance of Necessity (AoN) to 150 proposals worth Rs 2,47,515 crore approximately, under various categories of Capital procurement which promote domestic manufacturing as per DAP-2020.

This information was given by Raksha Rajya Mantri Shri Ajay Bhatt in a written reply to Shri MV Shreyams Kumar in Rajya Sabha on February 07, 2022.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1796164>



**Press Information Bureau**  
**Government of India**

**Ministry of Defence**

*Mon, 07 Feb 2022 4:36PM*

## **Foreign procurement by the defence services**

Details of expenditure incurred on Foreign Procurement under Capital Acquisition head for modernisation of the Defence Services from Financial year 2014-15 to 2021-22 are as under:

(Rs. In Crore)

<b>Year</b>	<b>Foreign Procurement</b>	<b>Foreign Procurement as % age of total Capital Acquisition Head</b>
2014-15	25,980.98	39.45
2015-16	23,192.23	37.20
2016-17	27,278.09	39.45
2017-18	29,035.42	39.92
2018-19	36,957.06	48.68
2019-20	38,156.83	41.89
2020-21	42,786.54	36.00
2021-22*	29,658.14	39.44

\* Upto December 2021

From the above table, it may be observed that component of the Foreign Procurements under this head has been progressively decreasing since 2018-19.

The government has taken several policy initiatives in past few years under 'Make in India' Program and brought reforms to encourage indigenous design, development and manufacture of defence equipment in the country, thereby reducing dependence on imports in coming years.

Further, Defence Acquisition Procedure (DAP) 2020 and other policy initiatives have focused on boosting indigenous defence capability, reducing reliance on imports and promoting Aatmanirbhar Bharat. These initiatives, inter-alia, include according priority to procurement of capital items from domestic sources under Defence Acquisition Procedure (DAP)-2020. Funds for Domestic Capital Procurement under Capital Acquisition Heads of Defence Services are also being earmarked from Financial Year 2020-21. Some of the measures/initiatives taken are:

- i. Notification of two 'Positive Indigenisation lists' for the Defence Services and one for Defence Public Sector Undertakings (DPSUs) for which there would be an embargo on the imports beyond the timeline indicated.
- ii. Introduction of a new category "Buy (Global –Manufacture in India)" to enable Foreign OEMs to set up Manufacturing facilities in India.
- iii. Make –III (newly introduced in DAP 2020) category to enable indigenisation of spares and import substitution.
- iv. Simplification of Make Procedure, Launch of Innovations of Defence Excellence (iDEX) scheme involving start-ups & Micro, Small and Medium Enterprises (MSMEs).
- v. Revision of offset guidelines focused towards development of Defence ecosystem while giving incentives to Transfer of Technology (ToT) and Defence Manufacturing, encouraging MSMEs & Defence Industrial Corridors.
- vi. Reservation for MSMEs and small Shipyards on orders upto Rs 100 Cr/year.
- vii. System for incentivising the use of indigenous Military Material and Software to encourage indigenisation of military material and indigenous development of software for military use.

Details of indigenous production of defence and aerospace related items from 2014-15 to 2020-21 are as under:

<b>S. No.</b>	<b>Financial Year</b>	<b>Total Annual Turnover (Rs in crore)</b>
1	2014-15	Not available *
2	2015-16	
3	2016-17	74054
4	2017-18	78820
5	2018-19	81120
6	2019-20	79071
7	2020-21	84643

\* No compilation of data for 2014-15 & 2015-16 has been done.

This information was given by Raksha Rajya Mantri Shri Ajay Bhatt in a written reply to Smt Priyanka Chaturvedi in Rajya Sabha on February 07, 2022.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1796174>

## Decoding the defence budget

*The finance minister must consider the viability of announcing independent service capital budgets in an era when the armed forces are undergoing a major transformation with the creation of the Department of Military Affairs (DMA) and theatre commands. Ideally, service allocation should be done by the CDS based on a common threat profile and joint capability requirements of the forces.*

*By Harsha Kakar*

New Delhi: The budget allocations by the Finance Minister indicate an upswing in government expenditure providing a boost to the economy. Economic development and national security go hand in hand. Addressing a seminar in Delhi in February 2018, General Bipin Rawat, the then army chief, stated, “Economic rise takes place if the country is secure.

Economic development and military modernisation must go hand-in-hand.” India’s security threats have been rising sharply, demanding capability and capacity upgradation. Simultaneously, a nation can never be militarily secure by banking on imported equipment. Military expenditure is dictated by the defence budget. The defence budget for the coming fiscal year is pegged at Rs 5.25 lakh crore, an increase of 9.8 per cent over the previous year. It is 2.03 per cent of the GDP and 13.3 per cent of government expenditure.



representational image (iStock photo)

Military share of the defence budget is Rs 4.78 Lakh crore as compared to Rs 4.71 Lakh crore of last year. The revenue component meant for salaries and maintaining forces is Rs 2.3 Lakh crores. The budget includes pensions to the tune of Rs 1.19 Lakh crore. Last year the armed forces spent Rs 20,776 crore in emergency purchases beyond the allocated budget due to continued border tensions. The capital budget, earmarked for modernization is Rs 1.52 lakh crore which is 12.8 per cent higher than the budget estimates and comprises 68 per cent of the defence budget.

Within this, the navy gained an increase of over 43 per cent from the previous year, while the air force got a marginal rise of 4.5 per cent. The army’s share went down by 12.2 per cent. This could possibly have been due to poor spending in the last budget by the army, which expended only 40 per cent of its share as compared to 70 per cent by the air force and 90 per cent by the navy. A factor to note is that the air force and naval platforms are more cost intensive as compared to the army.

Also development of capabilities takes time. While the increase is welcome, what is unknown is the amount due under committed liabilities for earlier procurements, which will impact availability of funds for current and future plans. The capital budget of the Border Roads Organization (BRO) has increased from Rs 2,500 to 3500 crore, approximately 40 per cent. This will enable connectivity to remote regions while enhancing military mobility. The coast guard also received a quantum leap in its share by approximately 60 per cent. This distribution of the capital budget between the services also displays the perception of threat in the near and mid future.

The government appears to consider the Indian Ocean Region emerging as a zone of competition in times to come. It also projects that in its opinion the army has sufficient capabilities for handling both the northern and western borders. Continued modernization of air power remains a necessity.

The current allocation would give a boost to the domestic industry as most naval construction is being done within the country, while air acquisitions currently in the pipeline are the Tejas, and the Tata manufactured C 295 transport aircraft. The government has earmarked 68 per cent or Rs



84,598 crore from the capital budget for domestic procurement, an increase of 10 per cent from the previous year. Additionally, a quarter of the defence R & D budget is being allocated for the private sector, start-ups and academia.

The finance minister also announced the creation of an independent nodal organization to meet wide-ranging testing and certification requirements of weapon systems, a demand of the private defence industry. Enhancing procurement from domestic sources is a welcome step. As stated earlier, there are hidden imports within domestic procurements. Engines for Tejas aircraft and the main battle tank and major components for naval ships, though covered under domestic procurements would actually be imported. The true picture would always remain hidden.

Involving the private sector in R and D is a step which was long awaited. The results are bound to be positive, though we need to be patient. However the R and D share is a meagre 0.7 per cent of the GDP as compared to 3 per cent in developed nations. Defence manufacturing capabilities are determined by exports, implying global acceptance. India is currently 23rd in the list of defence exporters.

It achieved exports worth Rs 8,434.84 crore in the last fiscal. It has set a target of Rs 35,000 crores or USD 5 billion by 2025. The recent sale of BrahMos to Philippines has come as a boost. Unless exports increase, investments by the private sector would begin to stagnate. In this the government has a major role. Empowering defence attaches to represent the Indian defence industry is not a long-term solution. Marginal increase in the revenue budget would place strains on the armed forces to maintain forces.

Increased deployment along the LAC, especially in Ladakh, are financially taxing and would impact revenue expenditure. The revenue budget is also utilized for upkeep of defence assets and maintaining readiness of forces. It would require juggling by finance departments of the services to meet aspirations of troops as also ensure operational readiness. Another factor of concern is FDI in the defence sector which has remained stagnant for the past two years despite the government permitting 74 per cent. This implies that the government has failed to garner confidence of major global arms manufacturers.

The finance minister must consider the viability of announcing independent service capital budgets in an era when the armed forces are undergoing a major transformation with the creation of the Department of Military Affairs (DMA) and theatre commands. Ideally, service allocation should be done by the CDS based on a common threat profile and joint capability requirements of the forces.

The finance minister must only announce allocations under major heads, leaving inter-service distribution to the DMA. A major pending demand of the forces for a rolling budget has once again been ignored. As it happened this year, services failed to expend their portion, resulting in surrender of funds. This could be avoided by having a rolling budget. While the budget appears to have met most requirements, the true availability of funds for capability enhancement would be known once figures of committed liabilities are released.

*(The writer is a retired Major-General of the Indian Army)*

<https://www.thestatesman.com/opinion/decoding-defence-budget-1503044438.html>



# From Australia to the Philippines: EAM's visit to focus on Indo-Pacific, Chinese aggression and deeper ties

*The visit is expected to take place early next week.*

*By Huma Siddiqui*

Close on the heels of the first ever export order of the BrahMos supersonic cruise missile deal being signed with the Philippines, external affairs minister Dr S Jaishankar is most likely to visit that country soon. Sources told Financial Express Online, "The dates have not been firmed up yet. Most likely the visit will happen."

The visit is expected to take place early next week. "The means, after the QUAD foreign ministers meeting gets over in Melbourne, Australia later this week, the minister might travel to the Philippines," the source quoted above added.

## **India & Philippines BrahMos Deal**

The Asean member country is soon expected to order more batteries of the supersonic Indo-Russian BrahMos supersonic cruise missiles. Last month, a contract worth USD 374.96 million, was sealed between the BrahMos Aerospace Pvt Ltd and the Department of National Defence of Philippines. The deal was done under the umbrella agreement which had been signed between the two countries earlier.



India & Philippines BrahMos Deal (Reuters Photo)

The BrahMos supersonic cruise missiles will be operated by the Philippines Marines. And soon another deal for the Philippines Army is likely to be firmed up.

In an earlier interaction, Atul Dinkar Rane, CEO & MD BrahMos, had confirmed to Financial Express Online, "We are ready to export more missiles to the Philippines, in case they place an order."

According to reports, the Philippines Army had activated its first land-based missile Unit in 2019, which is under its Army Artillery Regiment. Now, the army of that country is in negotiations to acquire BrahMos supersonic cruise missile from India.

## **Bullet Proof Jackets & Helmets from MKU Ltd**

Kanpur based MKU Ltd was among the first Indian companies which had exported Bullet Proof Jackets to the Philippines Army, a few years ago. This company is in the process of bidding for larger contracts for helmets and Bullet Proof Jackets.

## **Hindustan Aeronautics Limited (HAL)**

For the first time, Coast Guards of that country have sought more details about the indigenous "Dhruv" Advanced Light Helicopters (ALH), and 228-Dornier aircraft. There is a requirement of procuring seven ALH and eight Dornier aircraft under the USD 100 million Line of Credit which has been extended by India.

## **EAM's visit to the Philippines**

The visit to that country is likely early next week. And during the two day visit Dr Jaishankar is expected to meet and have talks with his Philippine counterpart, Secretary of Foreign Affairs Teddy Loesin Jr. The focus will be on the emerging challenges in the region, China's expansion in the region, peace and stability in the Indo-Pacific region and other issues of mutual interests.

According to sources, "when the visit happens, the minister is also expected to call on President Rodrigo Duterte."

The Asean member country is in the midst of modernizing its armed forces and enhancing its naval power. And, it has been reaching out to India for other platforms and body armour.

### **Previous high level visits from India**

Prime Minister Narendra Modi visited the country in 2017. And in 2018, President Duterte visited India as a guest for the Republic Day Celebrations.

When PM Modi had visited that country, in an effort to strengthen its Act East Policy, the two sides had signed a MoU related to the Logistics Cooperation and defence industry. This included production, development and procurement of defence materials.

At the foreign ministerial level the first visit was by the then external affairs minister Salman Khurshid and in 2013, the then minister of State Gen VK Singh had visited that country in 2017.

### **QUAD meeting later this week**

On February 10, the Indian external affairs minister is expected to visit Australia to attend the QUAD Foreign Affairs ministers meeting. Besides the multi-lateral aspect, according to sources a bilateral component is expected to be there.

In 2020, all the ministers of the QUAD had met physically. However, in 2021, the FMs meeting took place virtually.

### **Expected Agenda in Melbourne**

The last in-person QUAD FMs meet was in 2020 in Tokyo, followed by a virtual meet in February 2021.

Dr Jaishankar is expected to meet the US Secretary of State Anthony Blinken.

Expected one on meetings with top government officials of the host country –Australia.

The meeting with the US Secretary Blinken was announced by the US State Department's Bureau of East Asian and Pacific Affairs Assistant Secretary Daniel Kritenbrink.

### **Significance of the timing of the visit**

From Australia to the Philippines, the visits come at a time when the controversial Winter Olympic Games are going on in China. India along with many other countries has boycotted the games at the diplomatic level.

<https://www.financialexpress.com/defence/from-australia-to-the-philippines-eams-visit-to-focus-on-indo-pacific-chinese-aggression-and-deeper-ties/2427984/>

## Nanowires under tension create the basis for ultrafast transistors

Smaller chips, faster computers, less energy consumption. Novel concepts based on semiconductor nanowires are expected to make transistors in microelectronic circuits better and more efficient. Electron mobility plays a key role in this: The faster electrons can accelerate in these tiny wires, the faster a transistor can switch and the less energy it requires. A team of researchers from the Helmholtz-Zentrum Dresden-Rossendorf (HZDR), the TU Dresden and NaMLab has now succeeded in experimentally demonstrating that electron mobility in nanowires is remarkably enhanced when the shell places the wire core under tensile strain. This phenomenon offers novel opportunities for the development of ultrafast transistors.

Nanowires have a unique property: These ultra-thin wires can sustain very high elastic strains without damaging the crystal structure of the material. And yet the materials themselves are not unusual. Gallium arsenide, for example, is widely used in industrial manufacturing, and is known to have a high intrinsic electron mobility.

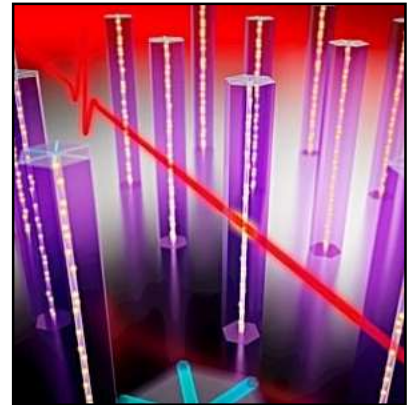
### Tension creates speed

To further enhance this mobility, the Dresden researchers produced nanowires consisting of a gallium arsenide core and an indium aluminum arsenide shell. The different chemical ingredients result in the crystal structures in the shell and the core having slightly different lattice spacings. This causes the shell to exert a high mechanical strain on the much thinner core. The gallium arsenide in the core changes its electronic properties. "We influence the effective mass of electrons in the core. The electrons become lighter, so to speak, which makes them more mobile," explained Dr. Emmanouil Dimakis, scientist at the HZDR's Institute of Ion Beam Physics and Materials Research and initiator of the recently published study.

What started out as a theoretical prediction has now been proven experimentally by the researchers in the recently published study. "We knew that the electrons in the core ought to be even more mobile in the tensile-strained crystal structure. But what we did not know was the extent to which the wire shell would affect electron mobility in the core. The core is extremely thin, allowing electrons to interact with the shell and be scattered by it," remarked Dimakis. A series of measurements and tests demonstrated this effect: Despite interaction with the shell, electrons in the core of the wires under investigation moved approximately thirty percent faster at room temperature than electrons in comparable nanowires that were strain-free or in bulk gallium arsenide.

### Revealing the core

The researchers measured electron mobility by applying contactless optical spectroscopy: Using an optical laser pulse, they set electrons free inside the material. The scientists selected the light-pulse energy such that the shell seems practically transparent to the light, and free electrons are only produced in the wire core. Subsequent high-frequency terahertz pulses caused the free



Terahertz spectroscopy measurements showed that the strained core of semiconductor nanowires can host fast moving electrons, a concept that could be employed for a new generation of nano-transistors. Credit: HZDR/Juniks

electrons to oscillate. "We practically give the electrons a kick and they start oscillating in the wire," explained PD Dr. Alexej Pashkin, who optimized the measurements for testing the core-shell nanowires under investigation in collaboration with his team at the HZDR.

Comparing the results with models reveals how the electrons move: The higher their speed and the fewer obstacles they encounter, the longer the oscillation lasts. "This is actually a standard technique. But this time we did not measure the whole wire—comprising the core and the shell—but only the tiny core. This was a new challenge for us. The core accounts for around one percent of the material. In other words, we excite about a hundred times fewer electrons and get a signal that is a hundred times weaker," stated Pashkin.

Consequently, the choice of sample was also a critical step. A typical sample contains an average of around 20,000 to 100,000 nanowires on a piece of substrate measuring roughly one square millimeter. If the wires are spaced even closer together on the sample, an undesirable effect can occur: Neighboring wires interact with each other, creating a signal similar to that of a single, thicker wire, and distorting the measurements. If this effect is not detected, the electron velocity obtained is too low. To rule out such interference, the Dresden research team carried out additional modeling as well as a series of measurements for nanowires with different densities.

### **Prototypes for fast transistors**

Trends in microelectronics and the semiconductor industry increasingly demand smaller transistors that switch ever faster. Experts anticipate that novel nanowire concepts for transistors will also make inroads into industrial production over the next few years. The development achieved in Dresden is particularly promising for ultra-fast transistors. The researchers' next step will be to develop the first prototypes based on the studied nanowires and to test their suitability for use. To do this, they intend to apply, test and enhance metallic contacts on the nanowires, as well as testing the doping of nanowires with silicon and optimizing manufacturing processes.

The research was published in *Nature Communications*.

**More information:** Leila Balaghi et al, High electron mobility in strained GaAs nanowires, *Nature Communications* (2021). [DOI: 10.1038/s41467-021-27006-z](https://doi.org/10.1038/s41467-021-27006-z)

**Journal information:** [Nature Communications](https://www.nature.com/articles/s41467-021-27006-z)  
<https://phys.org/news/2022-02-nanowires-tension-basis-ultrafast-transistors.html>

