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Press Information Bureau
Government of India

Ministry of Defence

Fri, 04 Feb 2022 6:04PM

Manufacturing in defence sector

Two Positive Indigenisation Lists comprising 101 and 108 items were promulgated on 21st August 2020 and 31st May 2021 respectively. The lists have been hosted on Ministry of Defence website to give wide visibility to the Defence Industrial base in enabling them to effectively meet requirements of the Armed Forces. The lists comprise not just of simple equipment but also some high technology weapon systems like, Artillery Guns, wheeled Armoured Fighting Vehicles, Light Combat Aircraft, Light Combat Helicopters, Next Generation Missile Vessels & Corvettes, Land based High Power Radars, Land based Short Range Surface to Air Missiles, rockets, bombs, and many other items to meet needs of our Defence Services.

In addition, to minimise import by DPSUs, Department of Defence Production (Ministry of Defence) has also notified a Positive Indigenisation list of sub-systems/ assemblies/ sub-assemblies/ components on 27th December 2021. This list contains 2,500 items, which are already indigenised and 351 items which will be indigenised in coming 3 years till December 2024. The list of these items and their details are available on SRIJAN portal on DDP website for Industry to show their interest.

India is on a progressive path to achieve 100% indigenisation of Naval Ammunition. 90% of Conventional Naval Ammunition by type have been indigenised. The balance, which includes niche technologies are being progressed through DPSUs/Private firms.

With regard to the guided weapons, such as missile, torpedoes, etc, indigenisation is being taken up progressively through DRDO and Indian Industry.

As part of the modernisation process of the Indian Navy, four Visakhapatnam class destroyers (Project 15B), which are upgraded version of the Kolkata class ships, are being constructed at Mazagon Dock Shipbuilders Ltd, Mumbai. The first ship of the Project 15B, INS Visakhapatnam was commissioned on 21 November 2021. Balance three ships of the project are being targeted for delivery between 2022 to 2024.

Details of other major initiatives for defence sector under 'Make in India' programme during last two years are as follows:

(a) Defence Acquisition Procedure 2020 (DAP-2020)

(i) DAP-2020 promulgated by MoD in October 2020, is aligned with the Government's vision of Aatmanirbhar Bharat and lays emphasis on higher indigenous content in procurement and faster acquisition for the Armed Forces.

(ii) In order to promote indigenous design and development of defence equipment, 'Buy {Indian-IDD (Indigenously Designed, Developed and Manufactured)}' category has been accorded top most priority for procurement of capital equipment.

(iii) Reforms in Offset policy have been included in DAP 2020, with thrust on attracting investment and Transfer of Technology for Defence manufacturing, by assigning higher multipliers to them.

(b) MAKE Projects: A comprehensively revamped ‘Make’ procedure has been introduced in DAP-2020 to facilitate indigenous design and development of defence equipment both with government funding and Industry funding, as follows: -

(i) ‘Make I’ sub-category is aimed at addressing projects involving design and development of major equipment/ systems/ platforms necessitating critical technologies and large infrastructure investment, with development periods not less than one year. Such projects involve Govt. funding of 70%.

(ii) Make II and Make III acquisition categories have been tailor-made to encourage Pvt Sector participation with provisions that lead to assured orders after successful development. In Make-II, if solutions have been offered even by a single individual or a firm or Suo- Moto proposal, the cases can be progressed as a Resultant Single Vendor. AIP once granted is not retracted even if DRDO/DPSUs are developing the item. Make-III is a new category added in DAP-20 that allows for manufacture of products in India as import substitution for support of weapon systems/ equipment held in the inventory of the Services.

(iii) 63 MAKE projects are being co-developed with the Indian defence industry, including MSMEs and Start-ups. Details of the same are available on the DDP/MoD official website.

(c) FDI Limit in Defence: FDI limit in defence manufacturing under the automatic route has been increased from 49% to 74%, and 100% after Govt clearance. With large platforms like ships & submarines, Mini UAVs, Electronic Warfare/ advanced Communication systems, technology intensive armament/ ammunition/ missiles falling under the purview of imports embargo, many opportunities will open up for JVs/ collaboration with global majors.

(d) Enhanced Budget for Domestic Procurement: The quantum of funds earmarked for domestic industry has risen from 57.67% of Capital Budget in FY 2020-21 to over 64.09% in FY 2021-22. Approximately 71% of proposals accorded AoN in the Annual Acquisition Plan (AAP) 2021-23 fall under the Indigenous category, out of which more than 15% have been earmarked for Indian private entities.

(e) iDEX: An innovation ecosystem for Defence titled Innovation for Defence Excellence (iDEX) has been launched in April 2018. iDEX is aimed at creation of an ecosystem to foster innovation and technology development in Defence and Aerospace by engaging Industries including MSMEs, Start-ups, Individual Innovators, R&D institutes and Academia and provide them grants/ funding and other support to carryout R&D which has potential for future adoption for Indian Defence and Aerospace needs.

(f) Technology Development Fund (TDF): Government has set up the Technology Development Fund (TDF) to encourage participation of public/ private industries especially MSMEs through provision of grants, so as to create an ecosystem for enhancing cutting edge technology capability for defence applications.

(g) Mission Raksha Gyan Shakti: The MoD has instituted a new framework titled ‘Mission Raksha Gyan Shakti’ which aims to provide boost to the IPR culture in indigenous defence industry.

(h) Import Substitution of High Value & Complex Spares: Through the efforts of the Department of Defence Production and the Services, drive for identification and indigenisation of all high value and complex spares through domestic Indian industry is underway. Towards this, a user friendly hub portal “Srijan” has also been hosted by the Ministry of Defence.

(i) Projects by DRDO: 52 projects are underway by DRDO in Mission Mode to meet critical defence equipment requirements of the three Services, wherein the DPSUs/ Private Industries are the production agency.

(j) Defence Industrial Corridors: Government has established two Defence Industrial Corridors, one each in the States of Uttar Pradesh and Tamil Nadu. The investments of Rs 20,000 Crore have been envisaged in Defence corridors of Uttar Pradesh and Tamil Nadu by year 2024. Moreover, the respective State Governments have also announced their Aerospace & Defence

Policies to attract private players as well as foreign companies including Original Equipment Manufacturers (OEMs) in these two corridors.

(k) Preference to MSMEs: Cases with AoN cost \leq Rs 100 Crs have been reserved for MSMEs (provided at least two or more MSMEs are eligible to participate in the category).

(l) Transfer of Technology (TOT) to Industries: DRDO developed technologies are being transferred to industries by entering into Licensing Agreement for Transfer of Technology (LATOT). These technologies are hosted on DRDO website and Indian industry can take these high end defence technologies as per the provisions on DRDO policy and procedure for transfer of technology. In year 2021, 182 LATOTs were signed with industries.

(m) Test Facility support to Industries: Several world class test facilities have now been opened for industries in DRDO labs and necessary SOP has been formulated.

(n) Scientific and Technological Support: Scientific and Technological support is provided to industry by DRDO on need basis.

(o) DRDO Patents: The details of the DRDO patents are available on DRDO website for use by industries. These patents are available free of cost to industries to enable Aatmanirbhar Bharat.

(p) Government-Owned Company Operated (GOCO): Under GOCO, private industries will operate and maintain DRDO assets, sparing them from the need to invest in land, machinery or other support systems.

Government has organised a Def Expo-2020 and Aero India-2021. Also, DRDO has organised the seminar on Energising the R&D capabilities with Industry, Academia & Certification Aspects for 'Aatmanirbhar Bharat' during Aero India-2021.

This information was given by Raksha Rajya Mantri Shri Ajay Bhatt in a written reply to Shri Brijbhushan Sharan Singh and others in Lok Sabha on February 04, 2022.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1795537>



Sat, 05 Feb 2022

Small industries to benefit as DRDO plans R&D centre in Tamil Nadu

Tamil Nadu: The small industries in Tamil Nadu will be taking advantage of more self-reliance in defence production announced by Union Finance Minister Nirmala Sitharaman during the 2022 budget speech.

Sitharaman, said, "Defence Research and Industry will be opened up for industry, startups, and academia with 25 percent of defence R&D Budget earmarked for it.

G. Satheesh Reddy, Chairman DRDO and Secretary Department of Defence (R&D) said in a statement, "The DRDO is planning an R&D centre in Tamil Nadu defence corridor where industries will be groomed by our scientists. An SPV will be formed soon which will lead to industries partnering DRDO in all stages of the supply chain from design, development, testing, production, marketing, and exports."

The DRDO chief also said that this is the time for the Indian industries to take advantage of the latest policies of the government and join hands with DRDO to deliver defence systems and technologies to the Indian defence forces.



Small industries to benefit as DRDO plans R&D centre in Tamil Nadu

Private industries will be encouraged to take up design and development of military platforms and equipment in collaboration with Defence Research and Development Organisation (DRDO) and other organisations through Special Purpose Vehicles (SPV) models."

Several companies in Coimbatore, Hosur, and Tiruchi are already in the defence production and research sector in Tamil Nadu and are in association with the DRDO. The proposed defence corridor is also expected to create an ecosystem where industries will be encouraged to take up more defence projects.

Tamil Nadu has over 120 aerospace manufacturing companies and 700 suppliers to various Defence Public Sector Undertakings (PSUs) already and with the new announcement in budget all these companies will get sizeable work for supplying components to major productions in the defence sector.

Other than small industries in Tamil Nadu spread across the industrial hubs of Coimbatore, Tiruchi, Hosur, big companies in the state like L&T and Ashok Leyland are already production partners of the DRDO.

The DRDO, will soon be grooming and developing several Tamil Nadu companies, both small and big, to advance design and development capabilities.

The main battle tank Arjun Mk-1A was developed by Combat Vehicles Research and Development Establishment in Chennai in collaboration with other DRDO labs. (KNN Bureau)

<https://knnindia.co.in/news/newsdetails/msme/small-industries-to-benefit-as-drdo-plans-rd-centre-in-tamil-nadu>

THE TIMES OF INDIA

Sat, 05 Feb 2022

KU, DRDO to host Defence Innovation Challenge

By Niyati Parikh

Ahmedabad: With a view to provide a platform to startups to come up with breakthrough innovations in the defence sector, Gandhinagar-based Karnavati University, in association with Defence Research and Development Organisation (DRDO), is all set to host a Defence Innovation Challenge. The competition, which was launched in January, is being organised by the Defence Design and Technology Incubator of India (DDTII), one of the leading defence incubator in India.



The initiative is being supported by the Department of Science and Technology (DST), Government of Gujarat. The winning teams will be rewarded with prize money and angel funding worth upto Rs 50 crore.

“The challenge is aimed at supporting Startups, Micro Small and Medium Enterprises (MSMEs) and innovators to come up with unique solutions and breakthrough technology interventions in the area of National Defence and Aerospace. The challenge will encourage participants to create prototypes and also enable them to commercialise products and solutions they have developed,” said Ritesh Hada, president, Karnavati University.

<https://timesofindia.indiatimes.com/home/education/news/ku-drdo-to-host-defence-innovation-challenge/articleshow/89351945.cms>

What is Ballistic Missile Defence Programme: All you need to know about it

- *The purpose of BMD is to defend and not attack.*
- *Phase 1 of BMD has been successfully tested and completed.*
- *BMD reduces incentive for enemy nation to launch nuclear attack.*

New Delhi: A ballistic missile is a missile with a high, arching trajectory, which is initially powered and guided but falls under gravity on to its target. These are guided only during relatively brief periods. Short-range ballistic missiles stay within the Earth's atmosphere, while intercontinental ballistic missiles are launched on a sub-orbital trajectory. In the early 90s, India faced huge threat of ballistic missiles attack from neighbouring nations. So, to protect the nation from the threat and any kind of attack, it developed Indian Ballistic Missile Defence (BMD) Programme to develop and deploy a multi-layered ballistic missile defence system to protect India from ballistic missile attacks.

What is Ballistic Missile Defence (BMD) System?

- It is a missile defence system that acts as a shield against ballistic missile attacks.
- The purpose is to defend and not attack.

There are two phases:

Phase 1: It has been successfully tested and completed but deployment awaits final official permission.

Phase 2: It is under development.

A BMD is a two-tier automates system which has:

- An advance radar system, early warning system, integrated command and control centre.
- Interceptor missile batteries: need to be agile, mobile and strategically located on land and sea.
- India's BMD is primarily developed by Defence Research and Development Organisation (DRDO) with the help of many public and private firms.

There are likely five possible configurations of BMD Programme:

- A land and sea-based defence system against all kind of threats.
- In second configuration, BMD is deployed to protect critical population centres, control and command centres, critical infrastructure centres (including nuclear facility) and major economic zones.
- Protection is provided to command and control centre, nuclear forces and important citizen population centres.
- It will provide protection to command and control centres and nuclear forces and the capital in the fourth configuration.
- The final configuration will involve BMD deployment only around command and control centre and the capital. Its purpose is only for total defence and not able to provide ability counter attack as nuclear forces are left out of it.

Why India needs BMD?

- India follows 'No First Use policy'. A robust BMD provides an opportunity to the nation to strike back if a nuclear projectile is launched by an enemy state.
- India has hostile, nuclear states in its north. It's only practical for the nation to prepare in advance.
- BMD reduces the incentive for the enemy nation to launch a nuclear attack.

- An indigenous system would reduce the import bill of defence systems from other nations.
- Technology developed for BMD can be used in other sectors.

Components:

Prithvi Air Defence (PAD): It is an anti-ballistic missile developed to intercept incoming ballistic missiles outside the atmosphere (exo-atmospheric). Based on the Prithvi missile, PAD is a two-stage missile with a maximum interception altitude of 80 km. The first stage is a Solid fuelled motor and second stage is Liquid fuelled.

Advanced Air Defence (AAD): It is an anti-ballistic missile designed to intercept incoming ballistic missiles in the endo-atmosphere at an altitude of 40 km. AAD is a single-stage, solid-fuelled missile with siliconised carbon jet vanes. Guidance is similar to that of PAD with indigenous radio frequency seeker.

Prithvi Defence Vehicle (PDV): The DRDO is developing a new Prithvi interceptor missile codenamed PDV. It will be a two-stage missile and both the stages will be powered by solid propellants.

Prithvi Defence Vehicle Mark 2: It is a 13 m tall, 18.87 tonnes, three stage missile. Solid rocket motors with flexible nozzles constituted the first two stages, with the Kill Vehicle being the third stage.

Swordfish RADAR: Is the target acquisition and fire control radar for the BMD system.

<https://www.news9live.com/knowledge/what-is-ballistic-missile-defence-programme-all-you-need-to-know-about-it-151699?infinitescroll=1>

Defence News

Defence Strategic: National/International



**Press Information Bureau
Government of India**

Ministry of Defence

Fri, 04 Feb 2022 6:05PM

Self-reliance in defence manufacturing

The Government has taken several policy initiatives and brought reforms to promote self-reliance in defence manufacturing. These policy initiatives are aimed at encouraging indigenous design & development, innovation and manufacture of defence equipment in the country, thereby reducing dependency on imports in long run. Important policy initiatives and reforms are as under:

- i. DPP-2016 has been revised as Defence Acquisition Procedure (DAP) 2020, which is driven by the tenets of Defence Reforms announced as part of ‘Aatmanirbhar Bharat Abhiyan’.
- ii. In order to promote indigenous design and development of defence equipment ‘Buy {Indian-IDDM (Indigenously Designed, Developed and Manufactured)}’ category has been accorded top most priority for procurement of capital equipment.
- iii. Ministry of Defence has notified ‘First Positive Indigenisation list’ of 101 items on 21st August 2020 and ‘2nd Positive Indigenisation list’ of 108 items on 31st May 2021 for which there would be an embargo on the import beyond the timelines indicated against them. This is a big step to promote indigenization in defence sector. This offers a great opportunity to the Indian defence industry to manufacture these items using their own design and development capabilities to meet the requirements of the Indian Armed Forces. These lists include some high

technology weapon systems like artillery guns, assault rifles, corvettes, sonar systems, transport aircrafts, light combat helicopters (LCHs), radars, wheeled armoured platform, rockets, bombs, armoured command post vehicle, armoured dozor and many other items to fulfill the needs of our Defence Services.

- iv. Further, the Government has notified a Positive Indigenization list of sub-systems/ assemblies/ sub-assemblies/ components of DPSUs on 27th December 2021. The list contains 2,500 items, which are already indigenised and 351 items for which there would be an embargo on import beyond the timelines indicated against them.
- v. The 'Make' Procedure of capital procurement which is aimed at encouraging design, development and manufacture of defence products by Indian private industry, primarily for import substitution, has been simplified. There is a provision for funding upto 70% of development cost by the Government to Indian industry under Make-I category. In addition, there are specific reservations for MSMEs under the 'Make' procedure.
- vi. Procedure for 'Make-II' category (Industry funded), introduced in DPP 2016 to encourage indigenous development and manufacture of defence equipment has number of industry friendly provisions such as relaxation of eligibility criterion, minimal documentation, provision for considering proposals suggested by industry/individual etc. So far, 62 projects relating to Army, Navy & Air Force have been accorded 'Approval in Principle'.
- vii. The Government of India has enhanced FDI in Defence Sector up to 74% through the Automatic Route for companies seeking new defence industrial license and up to 100% by Government Route wherever it is likely to result in access to modern technology.
- viii. An innovation ecosystem for Defence titled Innovations for Defence Excellence (iDEX) has been launched in April 2018. iDEX is aimed at creation of an ecosystem to foster innovation and technology development in Defence and Aerospace by engaging Industries including MSMEs, Start-ups, Individual Innovators, R&D institutes and Academia and provide them grants/funding and other support to carry out R&D which has potential for future adoption for Indian defence and aerospace needs.
- ix. Government has set up the Technology Development Fund (TDF) to encourage participation of public/ private industries especially MSMEs, through provision of grants, so as to create an eco-system for enhancing cutting-edge technology capability for defence applications.
- x. An indigenisation portal namely SRIJAN has been launched in August 2020 for DPSUs/Services with an industry interface to provide development support to MSMEs/Startups/Industry for import substitution. So far, 18023 Defence items, which were earlier imported, have been displayed on the portal. The Indian industry have shown their interest in 3826 items. Out of them, 3190 have already been indigenised.
- xi. 'Offset portal' has been launched in May 2019 to ensure Greater transparency, efficiency and accountability in the process. Reforms in Offset policy have been included in DAP 2020, with thrust on attracting investment and Transfer of Technology for Defence manufacturing, by assigning higher multipliers to them.
- xii. Government has notified the 'Strategic Partnership (SP)' Model in May 2017, which envisages establishment of long-term strategic partnerships with Indian entities through a transparent and competitive process, wherein they may tie up with global Original Equipment Manufacturers (OEMs) to seek technology transfers to set up domestic manufacturing infrastructure and supply chains.
- xiii. Government has notified a 'Policy for indigenisation of components and spares used in Defence Platforms' in March 2019 with the objective to create an industry ecosystem which is able to indigenize the imported components (including alloys & special materials) and sub-assemblies for defence equipment and platform manufactured in India.
- xiv. Government has established two Defence Industrial Corridors, one each in Uttar Pradesh and Tamil Nadu to attract investments of Rs 10,000 Cr in each corridor by year 2024-25. So far, investment of approx. Rs 3,750 crore in both the corridors by public and private sector

companies have been made. Moreover, the respective State Governments have also published their Aerospace & Defence Policies to attract industries including foreign companies in these two corridors.

- xv. An Inter-Governmental Agreement (IGA) on “Mutual Cooperation in Joint Manufacturing of Spares, Components, Aggregates and other material related to Russian/Soviet Origin Arms and Defence Equipment” was signed in Sep 2019. The objective of the IGA is to enhance the After Sales Support and operational availability of Russian origin equipment currently in service in Indian Armed Forces by organising production of spares and components in the territory of India by Indian Industry by way of creation of Joint Ventures/Partnership with Russian Original Equipment Manufacturers (OEMs) under the framework of the ‘Make in India’ initiative.
- xvi. Defence Products list requiring Industrial Licences has been rationalised and manufacture of most of parts or components does not require Industrial License. The initial validity period of the Industrial Licence granted under the IDR Act has been increased from 03 years to 15 years with a provision to further extend it by 03 years on case-to-case basis.
- xvii. Defence Investor Cell (DIC) has been created in Feb-2018 by the Ministry to provide all necessary information including addressing queries related to investment opportunities, procedures and regulatory requirements for investment in the sector. Till date, 1325 queries had been received and addressed by Defence Investor Cell.

This information was given by Raksha Rajya Mantri Shri Ajay Bhatt in a written reply to Shri Khagen Murmu and Shri Gm Siddeshwar in Lok Sabha on February 04, 2022.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1795540>



Press Information Bureau
Government of India

Ministry of Defence

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Manufacturing of defence equipment

In continuous pursuit of self reliance in defence manufacturing and to minimise import by DPSUs, the Government has notified a Positive Indigenisation list of sub-systems/assemblies/sub-assemblies/ components on 27th December 2021. The list contains 2,500 items which are already indigenised, and another 351 items for which there would be an embargo on imports beyond the timelines indicated against them. Addition of items in Positive Indigenisation List is a continuous activity which depends on the level of capabilities created in Indian Defence Industry.

In order to make India a global defence manufacturing hub, the Government has taken several policy initiatives in past few years under 'Make in India' programme and brought reforms to encourage indigenous design, development and manufacture of defence equipment in the country, thereby reducing dependency on imports in coming years. 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 2,851 items of 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 FDI policy allowing 74% FDI under automatic route; Simplification of Make Procedure; Launch of Innovations for Defence Excellence (iDEX) scheme involving startups and MSMEs; Implementation of “Public Procurement (Preference to Make in India), Order 2017; Launch of an indigenization 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 initiatives taken by the Government have resulted in enhancing the budget for Capital procurement through indigenous sources to 64% in the year 2020-21.

Government has issued 556 numbers of licenses till December 2021 to Indian companies for manufacturing of defence items. Further, 266 vendors have shown interest for indigenisation of items uploaded on the SRIJAN portal.

This information was given by Raksha Rajya Mantri Shri Ajay Bhatt in a written reply to Shri Sanjay Sadashivrao Mandlik and others in Lok Sabha on February 04, 2022.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1795533>



Press Information Bureau
Government of India

Ministry of Defence

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Enhancement of capacity of defence forces

Indian Army:

(i) The capacity & capability development plans of Indian Army remain dynamic/ flexible and are based upon the appreciated immediate & emerging national security challenges and in support of our operational response strategies. Accordingly, Indian Army is ensuring preparation & implementation of prioritised acquisition plans to maximize capacity & capability development, in consonance with the evolving threat perception.

(ii) **Defence Planning Committee (DPC):** The DPC under the chairmanship of National Security Advisor has been constituted in 2018 for facilitating Integrated Planning at the apex level and its focused execution to promote Strategic Planning, Capability Development, Defence Diplomacy and Indigenisation in Defence Sector.

(iii) **Appointment of CDS:** The appointment of the Chief of Defence Staff (CDS) and the creation of Department of Military Affairs (DMA), has resulted in far greater synergy with Ministry of Defence as also given the twin objectives of 'Integration/ Jointness' and 'Resource Optimisation' within the Services a much needed fillip.

(iv) **Long Term Modernisation Planning:** Factoring the emerging/ futuristic security challenges, and in consonance with the 'CCS Mandate to CDS' for implementing the Integrated Capability Development Plan (ICDP), an Integrated Capability Development System (ICADS) has been initiated vide DAP 2020. The ICADS process will maximise resource optimisation and infuse much needed jointness/integration in tri-services planning/ procurement process.

(v) **Army Design Bureau (ADB):** The ADB, since its raising in 2017, has made major forays in supporting R&D/ harnessing technology with an extensive outreach to industry, academia and ushering a collaborative engagement with the technology providers, manufacturers and users.

(vi) **Reorganisation of IHQ of MoD (Army):** The recent reorganisation of the Army HQ, creating a Deputy Chief for looking after both the Capability Development & Sustenance needs of the Indian Army, further empowers Indian Army to pursue a focused approach towards achieving the mandate of 'Atmanirbhar Bharat'.

(vii) **Raising of Niche Capability Structures:** To address critical capability voids in the domains of space, Cyber and Special Forces Capabilities, Niche Capability Structures in terms of Defence Space Agency, Defence Cyber Agency & Armed Forces Special Operations Division have been raised in 2018-19.

(viii) **Emergency Procurement Powers:** Emergency procurement Powers have been delegated to the Service Headquarters by the Government to address the emergent operational needs for effectively responding to the operational situation in Eastern Ladakh/Nothern Borders.

(ix) Defence Acquisition Procedure (DAP) 2020: The new DAP 2020 has been promulgated in October 2020 as an enabling document that lays emphasis on indigenous production and self-reliance under the 'Atmanirbhar Bharat' initiative and further streamlines capital procurements for the Army.

(x) Committee for Technical Modernisation of Armed Forces: To address long term technological capability needs of the Armed Forces, the Government has constituted a high level Committee, in October 2021, for recommending a Roadmap to achieve self-reliance and Technical Modernisation of the Armed Forces. The Roadmap prepared by the committee is likely to facilitate the Armed Forces in retaining continued focus on acquiring niche / emerging / disruptive capabilities & technologies for addressing the evolving threats & challenges that may manifest in the foreseeable future.

Indian Navy:

The modernisation of Indian Navy is an ongoing process and aims to strengthen India's maritime security. The capability development/ modernisation of the Indian Navy is being undertaken in accordance with the Long Term Integrated Perspective Plan (LTIPP). The ongoing modernisation aims to create capabilities for accomplishing a range of missions across the entire spectrum of threats and challenges addressing rapidly shifting global and regional balances of power.

Over 100 contracts have been concluded since 1st April, 2018 towards modernisation of the Indian Navy.

Indian Air Force:

To meet emerging challenges the Indian Air Force (IAF) is progressing well on a capability driven modernization plan in consonance with the roadmap laid down in the LTIPP. This is being achieved by the induction of the new platforms and weapon systems along with the continuous upgradation of the existing equipment.

In the fighter fleet, Rafale induction is under progress. LCA Mk1A has been contracted. Deliveries will commence from Jan 2024.

The major induction in the transport fleet will be the C-295 aircraft. Chinook and Apache helicopters have also been inducted.

There is significant progress in the Air Defence capabilities with the induction of new Radars and SAGW systems. The induction of S-400, MRSAM, VSHORADS, and CIWS will enable a layered Air Defence capability. Work has also commenced on the development of AEW&C Mk II by CABS, DRDO.

The MiG-29, Jaguar, Mirage-2000 and Mi-17 helicopters are being upgraded in a phased manner. Lastly and more importantly, the IAF is swiftly progressing towards complete Network Centric Operations and aims to improve ISR capability, Command and Control structures to meet the future challenges.

Consequent to shifting regional and global balance of power, IAF is continuously working towards enhancing its capacity to meet the emerging challenges in all the war fighting domains. A substantial offensive and defensive capability and ability to swiftly deploy/swing the forces to desired area of operation demonstrates its capability to deter any adversary.

IAF is sharpening its offensive edge through indigenization of aircraft, weapons and sensors (Light Combat Aircraft, Light Combat Helicopter, Brahmos, Long Range Surface to Air Missile), procurement of next generation assets such as Rafale and integration of weapons on existing and new platforms. IAF is also enhancing interactions in the form of exercises and joint training with friendly foreign countries to enhance cooperation and share best practices.

IAF is aware of changing character of warfare and emerging technological trends like drone technologies including anti drone and swarm drones, Manned-Unmanned Teaming (MUM-T) concepts utilizing UCAV and niche technologies. The role of Artificial Intelligence (AI) in planning and mission execution, quantum technology and advanced weapons including hypersonic weapon are key areas of further exploration and inclusion into IAF operational planning.

This information was given by Raksha Rajya Mantri Shri Ajay Bhatt in a written reply to Shri DK Suresh in the Lok Sabha on February 04, 2022.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1795536>



Press Information Bureau
Government of India

Ministry of Defence

Fri, 04 Feb 2022 6:06PM

Defence Industrial Corridors

The Government has established two Defence Industrial Corridors (DICs) in the country, one in Uttar Pradesh namely Uttar Pradesh Defence Industrial Corridor (UPDIC) and other in Tamil Nadu namely Tamil Nadu Defence Industrial Corridor (TNDIC) with an aim to attract investment of about Rs 10,000 crore in each corridor. Six nodes, namely Aligarh, Agra, Chitrakoot, Jhansi, Kanpur and Lucknow have been identified for UP Defence Industrial Corridor. Five nodes, namely Chennai, Coimbatore, Hosur, Salem and Tiruchirappalli have been identified for TN Defence Industrial Corridor. The nodes have been selected based on high potential for creation of end-to-end ecosystem for Aerospace and Defence sector development covering design, engineering and manufacturing.

As per information received from State Governments, in UP Defence Industrial Corridor, Uttar Pradesh Expressways Industrial Development Authority (UPEIDA), the nodal agency, has signed 62 (sixty-two) Memorandum of Understandings (MoUs) with private / public industries, worth potential investments of approx. Rs 8,638 crore. Out of 62 MoUs, 25 (twenty-five) proposals with potential investments of approx. Rs 2,527 crore have been finalized and land has been allotted to the industries. In TN Defence Industrial Corridors, Tamil Nadu Industrial Development Corporation (TIDCO), the nodal agency, has made arrangements through MoUs etc. for potential investment of Rs 11,153 crore by 40 Industries. Setting up of Defence Industrial Corridors aim to catalyse indigenous production of defence and aerospace related items, thereby reducing our reliance on imports and promoting export of these items to other countries which may create ample employment opportunities and growth of private domestic manufacturers; Micro, Small and Medium Enterprises (MSMEs); and start-ups. UP Government promulgated 'Uttar Pradesh Defence & Aerospace Unit and Employment Promotion Policy' in 2018 and TN Government promulgated 'Tamil Nadu Aerospace and Defence Industrial Policy' in the year 2019, offering incentives to the companies in form of Stamp duty incentives, Land cost incentives, Electricity tax exemption etc. Further, basic infrastructure support such as internal roads, drainage system, water and electricity supply etc. are also provided by the State Governments.

Micro, Small & Medium Enterprises are the integral part for the successful implementation of both the corridors attracting investments in Aerospace and Defence sector. Presently out of total 81 MOUs signed by both the State Governments in two Defence Industrial Corridors, 30 are with MSMEs. In both the corridors, investments have been attracted from Anchor industries, MSMEs, including Foreign Original Equipment Manufacturers (FOEMs) and Start-ups. Even under Offset policy, higher multiplier of 2.0x level has been assigned for investment in Defence Corridors. As per the provisions of FDI policy in Defence sector, foreign investments in the sector is subject to security clearance by Ministry of Home Affairs. Further foreign investments in the defence sector are also subject to scrutiny on grounds of National Security and Government reserves the right to review any foreign investment in the Defence sector that affects or may affect National Security.

At present, there is no proposal for setting up of Defence Industrial Corridors in Bihar.

This information was given by Raksha Rajya Mantri Shri Ajay Bhatt in a written reply to Shri Malook Nagar and Shri Rajiv Pratap Rudy in Lok Sabha on February 04, 2022.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1795541>

Army building credible, balanced posture to deter escalation: Vice Chief

Lt Gen Pande, who took over as the Vice Chief on February 1, also emphasised that India needs to build credible deterrence to succeed in wars.

By Krish Kaushik

New Delhi: A day after Army Chief General M M Naravane said disputed borders with nuclear neighbours and proxy wars are stretching the country's security apparatus and resources, his deputy, Vice Chief of Army Lt Gen Manoj Pande, said such legacy issues are becoming more complex, as the character of wars is changing.

Lt Gen Pande, who took over as the Vice Chief on February 1, also emphasised that India needs to build credible deterrence to succeed in wars.

Speaking at the Pragyan Conclave, organised by the Centre for Land Warfare Studies (CLAWS), Lt Gen Pande said, "Legacy challenges of our unsettled and disputed borders have become more complex in the face of changing character of future wars.... new tools of aggression, riding on disruptive technologies, and hostile actions that exploit the ambiguous Grey Zone of traditional war and peace, have transformed the battle-space."

To succeed in war, Pande said, "we will have to be proactive in building a credible deterrence," to defeat "the adversary's efforts to achieve its strategic goals and deterring military escalation".

"We are cognisant of these requirements," he added.

He said that for building capabilities and capacities to fight in a multi-dimensional war, the Army is "actively involved in modernising and evolving, keeping the future of conflicts in mind". At present, it is "building a credible and balanced force posture to deter escalation towards an armed conflict", Pande said.

It is high time, he said, for the Indian security establishment to "decipher the changing dynamics and respond accordingly".

Talking about the new domains of warfare, Pande said the "rapidly expanding domains of cyberspace and informatics necessitate a new approach to warfare", and multi-domain operations require "synergistic application of resources".

"We need to shed the classic war and peace disposition and enhance inter-agency cohesion," he said. "In fact, the critical need for all organs of the state, to work in unison towards the national objective, has been the core takeaway of the past year."

Pande also mentioned that "techno-social realm" such as social media also needs to be addressed in order to evaluate the rise of current and emerging trends and arrive at measures to counter information and influence operations, such as deep fakes and bots, with a focus on perception change and policy safeguards.

Grey Zone warfare, he said, is an "important component of future warfare". He said violent conflicts across the globe in the past few years are "already giving us an insight into the contours of future wars." Grey Zone warfare, he said, "is low-cost, involves lesser risks and results in very little retribution". Such campaigns are "typically built around non-military tools, as part of the tactics of remaining below key thresholds of response", he said.

"They employ diplomatic, informational, cyber, historical half-truths, proxy forces, terrorists, economic leverages and other tools and techniques, to avoid the impression of a military aggression."

He called understanding and accepting "the growing importance of new technologies, their application in warfare and impact on doctrines" as the "cornerstone to achieving transformation in the armed forces".

“Changes in organisation and operational concepts will facilitate this transformation,” he said.

Pande said, “The incorporation of Artificial Intelligence into military and national security realms will fundamentally change the way wars are fought and won... whichever nation triumphs in the AI race, will hold a critical and perhaps, insurmountable military and economic advantage.”

Empowering the strategic and operational military leadership, he said, is the “key to preparing a nation to deal with uncertain security challenges” allowing the armed forces to be “adapt to changes, quickly enough, to win future conflicts.”

<https://indianexpress.com/article/india/army-building-credible-balanced-posture-to-deter-escalation-says-new-vice-chief-7757073/>

THE TIMES OF INDIA

Sat, 05 Feb 2022

After Ladakh, Indian Army now plans to deploy K-9 howitzers in central, eastern sectors of LAC with China

New Delhi: Having successfully deployed and tested the K-9 Vajra Howitzers in the Ladakh sector, the Indian Army is now planning to deploy K-9 Vajra howitzers in the high altitude mountains in the central and eastern sector of the line of actual control with China. The Indian Army had deployed the made in India guns in Ladakh in the March-April timeframe last year along with the Eastern Ladakh sector and have been found to be very effective in those areas where they can move at high speeds and reach the frontline areas quickly.

"The trials of the guns have been very successful and now the plan is to order 200 more of these howitzers and deploy them in the high altitude mountainous region in the central sector including Uttarakhand and eastern sector including Sikkim and Arunachal Pradesh in areas where armoured vehicles can be moved swiftly," government sources told ANI.



After Ladakh, Indian Army now plans to deploy K-9 howitzers in central, eastern sectors of LAC with China (ANI)

The performance of the howitzer has been very good and fulfils the requirements of the Indian Army in high altitude areas, they said.

Recently, Army chief Gen Manoj Mukund Naravane had told ANI that the guns acquired for deployment in deserts and plains were put in the modifications with some modifications in view of the. Conflict with China.

The regiments in Ladakh have built special tents and facilities to operate the howitzers in extreme winters conditions.

General Naravane has been monitoring the induction and operations of the howitzers produced in the Larsen and Toubro facility in Hazira near Surat in Gujarat.

The self-propelled guns have a range of 38 kilometres but they have been successfully hitting targets at 50 kilometres in the mountains up to 16,000 feet altitude in Eastern Ladakh.

<https://timesofindia.indiatimes.com/india/after-ladakh-indian-army-now-plans-to-deploy-k-9-howitzers-in-central-eastern-sectors-of-lac-with-china/articleshow/89350134.cms>

Indian Navy hunts for submarine rescue simulators to train its sailors for deep-submergence rescue missions

The Indian Navy faces several maritime challenges in the Indian Ocean region. With both Pakistan and China enhancing their presence near its waters, it becomes imperative for India to boost its own resources.

By Sakshi Tiwari

For the past few years, it has remained focused on the development of submarines and the acquisition of submarine rescue systems that could aid it in case of a contingency. In a fresh development, India's Ministry of Defense (MoD) has issued a Request for Information (RFI) for submarine rescue simulators.

According to this RFI issued in January 2022, the MoD is acquiring two sets of simulators that would train Navy personnel to operate submarine rescue vessel (SRV) and remotely operated vehicle (ROV) systems.

The SRV one should be able to simulate the actual vehicle's rolling and pitching motions, as well as have the same "look, feel, functions, man-machine interface, and response time" as the Indian Navy's Deep-Submergence Rescue Vehicle (DSRV).

A DSRV is a type of deep-submergence vehicle used for submarine rescue operations and covert missions. India is one of the select countries that possess this capability. It has two DSRVs that it procured from James Fishers & Sons, a UK-based company.

The Indian Navy inducted its first DSRV in 2018 and the second one in 2019. Further, in 2020, a DSRV Complex was inaugurated at Vishakhapatnam to ensure the operational readiness of the vehicles with all equipment intact and ready to use.

With a growing fleet of submarines in the Indian Navy and its plans for expanding its fleet to deal with the challenges in the near seas, India's Ministry of Defense has earnestly pursued the DSRV project.

In the Goa Maritime Conclave attended by Indian Navy commanders and delegations from Indian Ocean countries last year, the service displayed its submarine rescue capability. Only a few countries in the IOR possess this capability, as previously reported by The Hindu.

In the Union Budget presented by the Finance Minister earlier this month, the Indian Navy had received an increased share amid "challenges in the Indian Ocean Region".

India's Deep Submergence Rescue Effort

The Indian Navy is equipped with two full third-generation fly-away submarine rescue systems. It received Deep Search and Rescue Vehicles (DSRV), Launch and Recovery Systems (LARS) equipment, Transfer under Pressure (TUP) systems, and all logistics and support equipment by the manufacturer. A 25-year all-inclusive maintenance support service was also included in the contract, according to JFD.

The equipment can reach a maximum depth of 650 meters and rescue 14 people in a single operation. Because submarine mishaps can happen anywhere, the DSRVs are built to be agile and easily transportable to remote locations, according to Capt. Koushik Hota, Officer in Charge, Submarine Rescue Unit (West).



Image- James Fisher and Sons

The entire system has been separated into 24 components, each with the footprint of a typical container and capable of being moved by road, sea, or air.

Heavy transport planes such as the IL-76 and C-17 could transport the DSRV, which is linked to the mother ship INS Sabarmati. “We’re looking at 72-96 hours from the moment of distress to the time of initial rescue,” Cdr V.K. Singh, pilot of the DSRV on the west coast explained.

The Navy also looks forward to participating in international submarine rescue exercises to sharpen their skills and deepen ties with neighbors and partners.

In April last year, India had dispatched two DSRVs to locate the missing Indonesian submarine KRI Nanggala, but they were pulled back mid-way after the Indonesian Navy reported that it had identified the missing sub’s debris.

During trials in 2018, the DSRV submerged to a depth of 666 meters, breaking the record for the deepest submergence by a manned vessel in the Indian seas.

The DSRV crew has also performed Remotely Operated Vehicle (ROV) operations at greater than 750 meters and Side Scan Sonar operations at greater than 650 meters.

Why Does Navy Need Simulators?

A simulator is a program or equipment that creates a virtual replica of a real-life environment, such as a flight simulator, for the purpose of training or experimentation. The Indian Navy would want to acquire DSRV simulators to impart real-time training to its personnel.

While the simulators have massive benefits, they do not aim to replace the training conducted on actual platforms. They merely familiarize the personnel with the platform that they will be required to operate. It is a time and cost-effective training instrument that is employed by militaries around the world.

In September last year, the Defense Ministry issued a policy for increased use of simulators by armed forces to provide safe and cost-effective realistic training while preserving expensive equipment.

The policy aims to reduce live equipment utilization, ensure capability plans account for phased induction of simulators, factor in simulator requirements when planning procurements, and establish a coordination mechanism among various agencies for a combined purchase of simulators, according to a statement from the ministry.

Last November, even the Indian Air Force had signed a deal with Hindustan Aeronautics Limited (HAL) to purchase two simulators for its nuclear-capable Jaguar aircraft, as previously reported by the EurAsian Times. So, the simulators will be used by all services to aid the military training effort.

As the focus of warfare and power assertion shifts to the sea, the Indian Navy seems to be strengthening its contingency efforts as well as enhancing its prospects of becoming the net security provider in the IOR in a true sense.

<https://eurasianimes.com/indian-navy-hunts-for-submarine-rescue-simulators/>

TIMESNOWNEWS.COM

Sun, 06 Feb 2022

Exclusive: EAM S Jaishankar to visit Manila for meeting with foreign secretary Teodoro Locsin

External Affairs Minister S Jaishankar is expected to brief Locsin about the Quad meeting, work towards a closer relationship and that could include more Brahmos missile transfers in the future

By Srinjoy Chowdhury

New Delhi: Days after India signed an epochal \$375 million defence deal with The Philippines, the external affairs minister, S Jaishankar, will be visiting Manila for a meeting with his

counterpart, foreign secretary Teodoro Locsin. This is the first visit by an Indian external affairs minister to The Philippines in nearly a decade.

The defence deal, the first major export of military material by India, involved the export of the Indo-Russian Brahmos missiles and launchers to the Philippines Navy. The country Manila is most worried about is China. It's dispute -- The Philippines went to court about China's creeping territorial claims-- went in favour of Manila, but China has refused to accept the judgement of the International court.



EAM S Jaishankar

Jaishankar, who arrives in The Philippines after the Quad foreign ministers meeting in Melbourne, Australia on February 13, is expected to brief Locsin about the Quad meeting, work towards a closer relationship and that could include more Brahmos missile transfers in the future. While The Philippine Navy has bought the Brahmos, there is the possibility of the Army buying the Indo-Russian supersonic missile with a range of 290 km after the elections later this year. Improved Indo-ASEAN ties could also be under discussion. Jaishankar could also call on the top leadership.

While the Quad has talked about economic rejuvenation, vaccine diplomacy and global warming, it is also about China. All four Quad countries are involved in Malabar, the annual naval exercise that China is wary of. Closer ties with The Philippines, an ASEAN country and a close ally of the United States comes as the Ladakh faceoff with China is still being resolved.

<https://www.timesnownews.com/india/article/exclusive-eam-s-jaishankar-to-visit-manila-for-meeting-with-foreign-secretary-teodoro-locsin/856156>

BusinessMirror

Sat, 05 Feb 2022

Bring out the 'big guns'

Military sustains momentum to build a credible PHL defense posture with signing of missile acquisition deal

By Rene Acosta

The Duterte administration's big-ticket weapons procurement program appears to be winding down, punctuated by the recent signing of the BrahMos shore-based anti-ship cruise missile deal signed by Defense Secretary Delfin Lorenzana a week ago.

The signing of the first-ever anti-ship and supersonic missile manufactured in India for the military marked the second phase of the last contract under the six-year term of President Duterte as earlier hinted by the defense chief.

Right after Lorenzana inked the deal for the acquisition of two brand-new and South Korean-made frigates in December, he disclosed that he would have to still sign the contracts for the procurement of Black Hawk helicopters and six offshore patrol vessels before the current administration draws down its purchases under the Armed Forces of the Philippines (AFP) Modernization Program.

The defense chief said he cannot sign procurement deals during the election period as they could be construed as "midnight contracts."

While Lorenzana cited the Black Hawks—the acquisition agreement for which he signed early this month—and the offshore patrol vessels as probably the last two procurements under Duterte, what he signed more than a week ago was the contract for the Indian-made missile, leaving the six patrol vessels still up for the taking. The patrol vessels are supposed to be acquired from Australia's shipbuilder Austal.

Urgent despite pandemic

While the procurement of the supersonic missile had earlier been deferred due to financial constraints as the Covid-19 crisis forced funds to be rechanneled to pandemic response, the military spelled out the urgency of acquiring it, both for deterrence and as a defense against the combination of swarming Chinese military and paramilitary ships in the West Philippine Sea (WPS).

“The BrahMos supersonic cruise missile will certainly beef up the firepower of the Philippine Navy, particularly the Philippine Marine Corps Coastal Defense Regiment,” Lorenzana explained in signing the P18.9-billion contract. “Its system will provide counter-attack capabilities within the Philippine exclusive economic zone (EEZ).”

The defense chief said the “world’s fastest supersonic cruise missile will provide deterrence against any attempt to undermine our sovereignty and sovereign rights, especially in the West Philippine Sea.”

The contract comprised three missile batteries, land-based mobile launchers, training for its handlers and maintenance forces, and logistical support.

The procurement of the missiles, with Marine forces as the end-users, was a sort of vindication for the Marine troopers themselves who have been pushing and advocating for the arming of Marines guarding the Kalayaan Island Group and WPS—even with simply shoulder-fired missiles as early as during the time of their former commandant, retired Marine General Juancho Sabban.

When Sabban was designated commander of the Western Command based in Palawan, he routinely dealt with Chinese fishing vessels that began to encroach and populate the WPS. If he had his way, Sabban would have preferred the seizure of the boats and sinking them even on site.

Sabban also ordered the removal of any marker that China had installed in the WPS, a task that was usually relegated to the Navy’s Naval Special Operations Group (NAVSOG).

While Sabban’s aggressive or even heavy-handed tactics discouraged Chinese boats from venturing into the country’s EEZ, he was however admonished by defense officials at Camp Aguinaldo.

‘Big boost’

THE Navy said the cruise missiles will go a long way in its task of securing the country’s maritime domain.

“The acquisition of the shore-based anti-ship missile will boost the capability of the Philippine Navy, particularly the Philippine Marine Corps Coastal Defense Regiment as the end-user,” said Navy spokesman Commander Benjo Negranza.

“It will increase the capability of the AFP, particularly the Philippine Navy, to defend the country’s extensive maritime borders,” he added.

According to Lorenzana, the procurement of a shore-based anti-ship missile for the Navy was conceptualized as early as 2017, and was approved by Duterte in 2020 for its inclusion in the second phase of the revised military modernization program.

The project identified the Navy and the Marines as the first beneficiaries, as they are at the forefront of defending the country’s archipelago.

“Equipping our Navy with this vital asset is imperative as the Philippines continues to protect the integrity of its territory and defend its national interests,” Lorenzana said.

If the next administration pursues the missile build-up program, the BrahMos missiles may also find their way into other major armed services of the military, as Lorenzana said earlier that a land-based type is also being considered for the Army.

In fact, when the BrahMos product was first considered, the Army was then considered as the maiden beneficiary before the other units.

<https://businessmirror.com.ph/2022/02/05/bring-out-the-big-guns/>

Indian Air Force's biggest war drill to be held at Pokhran

Jaisalmer: The Indian Air Force's biggest war exercise Vayushakti-2022 will be held at Pokhran field firing range on March 5. Around 140 planes including 100 fighter planes will take part in the drill. Earlier, the exercise was scheduled to be held on February 10.

President Ramnath Kovind, PM Narendra Modi, Defence Minister Rajnath Singh, chief of three armies and other dignitaries are expected to witness IAF's grand demonstration of capability.

For the purpose, a meeting of Air Force Station, Jaisalmer station commander group captain Amardeep Singh Pannu and district collector was organised at the Air Force Station on Friday.

Pannu sought cooperation of the administration. Officials reviewed the supply of drinking water, power supply, housing arrangements, road repair works at Air Force range and Air Force Station, Jaisalmer, repairing of the main road in Chandan range, its cleanliness and beautification, cleaning of the city, security and traffic arrangements, medical arrangements, internet, etc.

District collector Pratibha Singh assured to extend all cooperation for Vayushakti-2022 and assured that the expected information will be sent on time so that high level arrangements can be made. Officers from the Air Force and administration attended the meeting.

According to Army official sources, IAF has started the preparations in Chandhan range for the fire power demonstration. Many fighter planes are passing over Jaisalmer and practising hitting the targets.

According to the sources, many kinds of missiles will be used in this war exercise. Rafale planes will also be used and the MICA missile fitted to it will be a special attraction.

Moreover, Sukhoi-30, MkI, MiG29, LCA Tejas, Mirage 2000, MiG-21 Bison, hawk and jaguar will be part of the exercise. Apache, Chinook and Dhruv helicopters will take part in night operations and will hit targets.

This war exercise is held once in three years. Many types of operations will take place in this exercise including defensive counter air, offensive counter air, counter air strike, suppress enemy air defence and target of opportunity.

Female pilots are also taking part in this exercise. They will fly MiG-21 Bison fighter planes. Till now, 10 women fighter pilots have confirmed participation and three more are expected to join the exercise.

<https://timesofindia.indiatimes.com/city/jaipur/iafs-biggest-war-drill-to-be-held-at-pokhran/articleshow/89356682.cms>



President Ramnath Kovind, PM Narendra Modi, defence minister Rajnath Singh, chief of three armies and other dignitaries are expected to witness IAF's grand demonstration of capability.



Sat, 05 Feb 2022

‘Brahmos makes its mark, signals arrival of Indian military technology on global stage’: Pankaj Saran, Ex Dy NSA

By Amitabh P. Revi

In his first interview since demitting office as Deputy NSA, Ambassador Saran discusses the \$ 374.96 million BrahMos supersonic missile deal with the Philippines, its strategic significance, India overcoming strategic hesitancy, the relationship between domestic defence technology and national power, the implications of third-country defence exports, the target of \$ 5 billion in defence exports by 2025, working with other countries to export defence know-how, China’s behaviour that is catalysing such deals, China reaction to Brahmos, China’s defence, nuclear and missile technology transfers to Pakistan, Russia-China partnership, India’s Integrated Guided Missile Development Programme(IGMDP) and the Missile Technology Control Regime(MTCR).



BrahMos to Philippines

It is a big development. It is a development that has significance both in terms of our defence capabilities domestically, as well as in terms of our relationships with other countries and the role that our defence capabilities can play in furthering our strategic and other goals. It symbolizes the overcoming of what one can perhaps call strategic hesitancy, which has characterized a lot of our decision making in the past and also overcoming to a great extent technological backwardness in the defence manufacturing sector. The two seem to have come together in this particular contract.

BrahMos: Best in the world

No question (BrahMos) that it is probably the best and the fastest cruise missile in the world. When you have a good product and when you have achieved technological superiority then naturally there will be recognized and there will then be demand. This is a great feather in our cap. These things don’t happen easily. The joint venture was created in 1999. It’s taken 23 years for the first export to be contracted. If we go beyond this particular missile, which has many variants.

In the last few weeks, we have seen two successful tests. One was the naval variant and the other ones launched from Chandipur with higher technological specifications. This missile itself has so many variants both in terms of range as well as in terms of the domain from which it can be used. But in addition to this, it is a fact that the Indian missile programme has definitely matured.

Ever since the launch of the famous Integrated Guided Missile Development Programme of 1982. So when you have persevered and done a lot of hard work and a lot of it quietly with a mix of both success and failure, and you finally arrive at a stage where you have a product that has been introduced in all the three armed forces of India. And it has demonstrated its progress at all international shows and met the highest standards, it’s a great tribute to scientists and technologists and policy planners. I know for a fact that the Brahmos Corporation has been ready to sell for a long time. And it’s very interesting because if you talk to those people and the management, they are very proud and very confident of the product. And they have no doubt in their mind that what they have to offer is the best in the world, which is why this missile was inducted without much fuss in all the three services and today it’s in deployment, whether it’s from aircraft, sea, and land.

This is probably an explanation for why it has gathered so much recognition across geographies and generated so much interest.

\$5 Bn exports by 2025: Big Menu of Missiles, LCA

India is going to get into defence exports in a very big way. This is a decision that has been taken. The Prime Minister has set a target of \$5 billion by 2025. But obviously, our defence export activity is going to be perfectly in conformity with international laws and treaties. So, whether it is the MTCR or any other treaty, we will ensure that whatever we do falls within the remit. The scope is there with demand and what we can supply technology. We will have to comply with MTCR obligations. There is no leeway in that.

We are not in the business like some other countries, who actually do a lot of cutting corners and doing things by subterfuge and by cheating. Whatever we want to do is going to be very much transparent. It's not just the BrahMos that is available. I mean, there is a whole menu of missiles that we have developed and for example, the Akash, the Nag, the LCA. There is a big variety, a big menu of capabilities that actually have been deployed and are available.

Overcoming Strategic Hesitancy

It's a political decision. It's a statement about our own image that we have. If you look at it empirically, there is a strong correlation between domestic manufacturing capability in the defence sector and national power. If you look at national power as a necessary condition, that you must have a decent, diverse and a widespread industrial base when it comes to defence manufacturing. It may not be a sufficient condition to enhance national power, but it seems to be a necessary condition.

Facts tell us, when you look at the largest defence manufacturers in the world or the largest defence exporters, there are only a handful of them. All of them are industrialized powers. Defence exports can't happen in a vacuum. You have to have the domestic capabilities before you begin to export. The two go hand in hand.

The decision taken in India is that we must make up for lost time by ramping up our manufacturing industrial base, by ramping up our technological progress and pace which also translates into what we want to do in the defence sector.

Historically, the defence sector has played a pivotal role in the industrial transformation of almost all major countries and economies. When you put the two together, which is your desire to ramp up manufacturing, your desire to ramp up national power, and grow rapidly, the role that the defence sector can play, then you realise that you also have to then get into the business of making sure that what you produce is internationally competitive, and is as per international standards, because you do not want to equip your armed forces with substandard equipment.

The moment you start doing this you also keep an eye on the export bucket and the world around you. And there is this feeling that India must, given its resources, its attributes also get into defence exports. We started with say software exports a few decades ago. You can't keep exporting primary goods, raw material and agricultural commodities or even semi-finished products and expect to then help yourself domestically. In today's day and age, your national competitiveness and global competitiveness are very closely interlinked.

When I said strategic hesitancy, what I meant also apart from the economic part of it was also the strategic part, where if you have something which is good, which is proven, which is of exceptionally high quality, and you have buyers for it, then why should you not enter this market and in that sense, you leverage your competencies to achieve other larger strategic goals. Like any other country in the world, like any other major player in the world, there is no real reason for us to hold ourselves back as long as you have the capability. And it's a bit of a cyclical or rather, I would say a circular argument. But one leads to the other.

China's Behaviour & Overcoming Strategic Hesitancy

China is a very good case study of how a country has rapidly developed into a major defence exporter. China has entered this in a very, very big way. They are exporting to the entire world, not least to our neighbours. The history of cooperation with Pakistan, Myanmar, Bangladesh, Sri

Lanka are all facts of life. They should therefore have no difficulty at all if some country close to them or in the neighborhood, or anywhere else for that matter wishes to take completely independent decisions to acquire an Indian military platform.

We should have no hesitation in responding to such requests, and they should have no difficulties because they've done this. They have done more. They have shown us how they can reverse engineer technologies. We are not in that game. Everything we have done is done indigenously.

Concerns over Technology Falling into Wrong Hands

It would be a worry, I mean, this is a worry for every exporter every sophisticated high technology military item, it applies even to cases where we import from established defense supplier so this is a worry and you know when you when you switch from being an importer of defense equipment, to being an exporter of defense equipment or defense technology, you have to take these things into account. There are many technology regimes, many controls that have been placed nationally and multilaterally. They are geared to ensure that technology does not fall into the wrong hands. That it does not fall into the hands of adversaries.

3rd Country Exports & the Russia-China Partnership

The joint venture was established in 1999, 23 years ago. It was a very visionary step taken. At that time, the defence sector in India, the manufacturing sector, was largely closed. At best you would have had licensed production of some equipment like tanks or some of the aircraft etc. But this involved sharing of technology. There were a lot of doubters about the success of this joint venture. But time has shown that the decision taken to go into this collaboration with the Russian NPOM was in hindsight a good decision, because you have this world class platform, the cruise missile.

The Indian experience of dealing with the NPOM, the Russians has been quite good in terms of technology sharing, in terms of upgradation and we actually have reached a stage where the Russians have shown a lot of interest in acquiring and utilising this product into their own systems. This has paved the ground for becoming more ambitious. We have set up a joint venture to manufacture the Kalashnikov. You can imagine a situation where in a few years time, we could have similar experiences of exporting to third countries, this joint India-Russia, technology.

This is something which has always been of great interest to us, because we have many friendly partners and new countries with whom we have relations of trust. We have said, look, why don't we work together, whether it is the United States, France, Germany, Israel, Russia, of course, that why don't we use the Indian manufacturing base, the size of the Indian market, and the human resources etc to leverage our mutual complementarities to export to third countries.

This is happening and it has begun to happen. Now when you do this, you have an obligation because you have a joint venture and you have to consult each other. Because there are political, technology and military sensitivities. So you have a process of consultation to decide on each export. This is fairly standard procedure in this business. It's nothing specific to the BrahMos.

When you do export, say to the Philippines, it's with the full consent of the Russians. Insofar as the Russia-China relationship is concerned. I don't see a direct kind of relationship. We have our own independent relationship with Russia. We have our own independent relationship with the Philippines. I don't see what role China has in this particular contract. The Philippines wanted to buy this. Why they asked to buy the BrahMos, what propelled them to take the decision. That's their call. The fact of the matter is that they wanted to buy the BrahMos and neither us nor the Russians had any objection to that.

3rd Country Exports & \$5 Bn Target

Already with the United States, etc, there are projects that are underway or proposed where you would be exporting to third countries. It may not be finished products. It could be some sub-assemblies and other things. If you look ahead, given the kind of developments that are taking place in our own defence sector and the series of reforms that have been introduced, for example,

even simple things like allowing FDI up to 74% and 100% in the case of the government route, the reforms in the Ordnance Factory boards, the entry of the private sector, a host of other reforms.

There are many unfolding initiatives which are underway, for example, the development of aircraft engines, drone technology, naval vessels. We are in the process of launching an aircraft carrier. There are different product lines, different platforms, where we are looking ahead very, very seriously. Even aircraft, for example, the Light Combat Aircraft.

These have enormous potential and the nature of the business is such that you have to have integration with foreign partners, foreign collaborators. To expect 100% indigenous products is neither practical nor perhaps is it technologically deserved, because apart from economies of scale, you also need to harness the competitive technologies of partners and if they are willing to join with you. It would be profitable for both parties.

Even if you look at say the target of exports-\$5 billion by 2025. Assuming that the Brahmos deal is \$375 million. If you divide 5 billion by 375 million, all you need is another 13, if my math is correct, similar deals and you'd have achieved your target of 5 billion with one system alone. It's great that the leadership is setting high standards. Ambition levels are much higher today. But that also is a product of your own self-confidence.

It is definitely palpable and the armed forces are on board. The other reality of life is that if you want a strong military and a strong army, you have to be self-reliant in terms of the kind of equipment, technologies, doctrines they use. And this label that we have of the world's second-largest importer is not exactly a great compliment for our capabilities.

<https://bharatshakti.in/brahmos-makes-its-mark-signals-arrival-of-indian-military-technology-on-global-stage-pankaj-saran-ex-dy-nsa/>

The Telegraph online

Sat, 05 Feb 2022

Revival of abandoned World War-II airstrip in Odisha on track

The facility to be used for both defence and commercial purposes: Minister

Efforts to revive the abandoned World War-II Amarda airstrip at Rasgobindpur in Mayurbhanj district have picked up pace with Mayurbhanj MP and Union minister for tribal affairs and Jal Shakti Bishweswar Tudu meeting senior Air Force officials recently to discuss the issue.

Speaking to The Telegraph, Tudu said: "I had a meeting with Air Vice-Marshal Ranade in New Delhi on developing the airstrip as a full-fledged airport on Friday. I have already discussed this issue with defence minister Rajnath Singh. Following Rajnathji's assurance, I had met the officials of the Defence Research and Development Organisation (DRDO) and other senior officials of different wings of the Air Force. A DRDO team has already visited the site. Another team from the Indian Air Force is coming in March to assess the site. Work will start soon."



The World War-II Amarda airstrip at Rasgobindpur in Odisha's Mayurbhanj district. The Telegraph

Tudu said the airport would be used both for defence and commercial purposes.

"The airport is closer to the DRDO's Chandipur base at Balasore, which is hardly 30km from there. Besides, it is close to other missile launching sites. The scientists can fly to this place directly.

"The airport is also nearer to Calcutta and will be commercially viable. It can be developed as a backup to the Kalaikunda Air Force Station in Bengal. It can be used for defence purposes keeping

in mind the rise in tension with some of our neighbouring countries. It will boost the economy of a backward district such as Mayurbhanj.”

Group Captain Bikash Kanungo told The Telegraph that Kalaikunda was one of the strategically important Air Force stations, located around 140km from Amarda airstrip in Mayurbhanj. “There is no airbase south of Kalaikunda. If the Amarda air base is developed, it will be helpful in recovering any fighter plane in case of an emergency. Strategically, it will be best suited as a diversionary airbase and will help to strengthen India’s air power.”

Historian Anil Dhir, who has done a lot of historical research on the Amarda airfield, said the airport would serve the interests of the nation to a great extent. “It has one of the longest runways with around 900 acres of land. The airport has also the infrastructure for setting up aircraft maintenance, repair and overhaul (MRO) facilities. Being close to the Bay of Bengal, trails and testing of aircraft will also be safer and easier.”

According to the historian, the Amarda airstrip had a short but illustrious history, which has never been made public. “It was made during the Second World War (1939-45) as a forward airfield against the Japanese conquest of Burma. The large strip was used as a landing ground for planes and a training space for special bombing missions.

Its runway, which is over 3.5km, is the longest runway in Asia. The total runways, taxiways and aprons together constitute more than 60km. It was abandoned after the war.”

He said very few people knew that the Odisha skies had seen the crash of two giant aircraft, which had collided against each other and resulted in the deaths of 14 airmen.

“On July 26, 1945, two British Royal Air Force B-24 Liberator four-engine bombers had collided at a low altitude near the secret Amarda airfield. Fourteen airmen — the crew of the two aircraft — died in the crash. The airmen belonged to Britain, Netherlands, Canada, the US, Australia and New Zealand. One of them was an Indian. We now demand that a memorial be set up there. Whatever I have collected over the years, I would donate to the memorial,” Dhir said.

Citing India as one of the fastest-growing aviation markets in the world, he said the site could be developed as a hub for aircraft maintenance, repair and overhaul.

Quoting the Economic Survey report for 2019-20, Dhir said: “The annual import of MRO services by Indian carriers is around Rs 10,000 crore. With airlines’ fleet growing annually by 100, the size of domestic airline MRO is set to grow annually to Rs 21,600 crore in the next five years and to Rs 36,000 crore once the fleet size reaches 2,000 aircraft. If we develop the Amarda as MRO, India can also benefit a lot.”

<https://www.telegraphindia.com/india/revival-of-abandoned-world-war-ii-airstrip-in-odisha-on-track/cid/1850710>



Sat, 05 Feb 2022

Space race: Outlining space strategies

The drawing up of space strategies by the US, Britain, and China are indicative of the growing space ambition of global powers

By Manoj Joshi

Space is the new frontier of the global geopolitical competition. In the past week, we have had two significant national publications outlining this. On Wednesday, Britain came out with its first-ever Defence Space Strategy (DSS), and a few days before that, China released a White Paper on Space. Just a month before, in December 2021, the United States (US) had released a “Space Priorities Framework.”

The British Defence Space Strategy is subtitled “Operationalising the Space Domain” and is also viewed as a component of the country’s larger National Space Strategy that had been

published in September 2021. The DSS is aimed at setting out British plans to “address growing threats” in space and support greater “global surveillance and intelligence for military operations”.

As for the Chinese, they have put forward their White Paper without specific reference to defence. The paper speaks of the need to “integrate space science, technology, and application...for high quality development”. But it makes no bones about the fact that this is the beginning of “a new journey toward [becoming] a space power.”

Britain came out with its first-ever Defence Space Strategy (DSS), and a few days before that, China released a White Paper on Space.

A year earlier in 2020, the US had also released its first Defence Space Strategy which emerged from its 2018 National Strategy for Space.

For the British, this is an important step in seeking military benefits from the ongoing civilian programmes, something that was also triggered by Brexit. As much was suggested by the [Integrated Review](#), a kind of a national security strategy document that was published in March 2021. This was followed a week later by the Defence Command Paper “Defence in a competitive age.”

The British DSS speaks of a GBP 1.4 billion investment in addition to an ongoing GBP 5 billion to upgrade the United Kingdom’s Skynet communications satellite. A part of the new investment would be used for satellites for greater global surveillance and intelligence for the military, and GBP 61 million to develop cutting edge laser communications technology to deliver data from space to Earth.

The British DSS has set its context in the emerging threats from space, including electronic warfare, cyber attacks, directed energy weapons, co-orbital satellites, and direct ascent missiles to attack satellites. China naturally figures as a major challenge with its direct-ascent anti-satellite programme, technologies relating to co-orbital anti-satellite systems.

China’s White Paper is not about defence, but ostensibly civilian applications of space. But the Chinese space programme itself is an offshoot of its defence programme, and the China National Space Administration (CNSA) is part of the State Administration for Science, Technology and Industry for National Defense (SASTIND). Under it are two key state-owned enterprises, the China Aerospace Science and Industry Corporation (CASIC) and the China Aerospace Science and Technology Corporation (CASC) all of these are descended from the No. 5 Research Academy of the Ministry of National Defence.

The Chinese space programme itself is an offshoot of its defence programme, and the China National Space Administration (CNSA) is part of the State Administration for Science, Technology and Industry for National Defense (SASTIND).

According to the White Paper, from 2016 to 2021, China completed some 207 launch missions mainly by using the Long March-5 rocket. Now, in the next five years, China plans “to send into space new generation manned carrier rockets and high thrust solid fuel carrier rockets, and speed up the R&D of heavy-lift launch vehicles.”

A major achievement of last year was the launch of the ‘Tianhe’, the core module of its new space station and the two missions comprising of three astronauts each in June and October 2021. This year, two other modules of the space station are likely to be sent up to create a T-shaped station by the end of the year.

In addition, the White Paper has spoken of the Chinese activities in high-resolution Earth and ocean observation and meteorological satellites, as well as fixed communication and broadcasting satellite networks. It is now offering its 30-satellite BeiDou navigation satellite system for services around the world.

A new mission that the White Paper has revealed is that of a space telescope, Xuntian, which will launch to the same orbit as the space station and dock with it periodically.

A major focus will be the Moon missions, which aims to eventually set up a lunar base. In addition, according to the White Paper, China will “complete key technological research on Mars sampling and return, exploration of the Jupiter system and so forth” as well as take up the

exploration of the solar system through a mission that would send up twin probes into the edge of the heliosphere.

The White Paper has spoken of the Chinese activities in high-resolution Earth and ocean observation and meteorological satellites, as well as fixed communication and broadcasting satellite networks.

The White Paper is a public document and China has sought to project its goals similar to the ones outlined by the US Space Priorities' paper as well on the peaceful uses of outer space and of "cooperation and sharing" and international exchanges, and "expanding global public services for space technology and products". It has also spoken of global governance of outer space and international cooperation by "safeguarding the central role" of the UN treaty on the uses of outer space.

Taking a leaf out of the American playbook, China has encouraged its private sector to also participate in its space ventures. As of 2018, some 141 aerospace enterprises dealing with satellite manufacturing, launch vehicles, satellite operations, and so on have been registered in China.

Many space systems are dual-use, such as observation, navigation, and communications satellites. Details of military satellites such as those dedicated for electronic intelligence and targeting are rarely disclosed by any country. But what worries the world are certain new technologies that China has listed, such as "in orbit service and maintenance of spacecraft and space debris cleaning". Like all space powers, China has been affected by space debris, and recently complained that its space station had to make evasive manoeuvres to avoid one of Elon Musk's Starlink satellites.

But space debris mitigation technologies are 'dual use', having both civilian and military applications. Satellites with the ability to rendezvous and attach to a satellite for refueling and repair can also be used to disable adversary satellites. Not surprisingly, there was a lot of attention paid when last October, China launched a Shijian 21 satellite which was aimed at testing "space debris mitigation technologies". The Secure World Foundation has a number of fact-sheets listing the anti-satellite tests, rendezvous and proximity operations of countries like China, India, Russia, and the United States. The Chinese activities in these areas are listed here.

As of now, the US remains a world leader in space technologies, a fact underscored by the deployment of the new James Webb telescope, a hundred times more powerful than its predecessor Hubble. But over the years, it has lost key ground on developing new launch vehicles, space stations, and deep space focus. Now, it is bouncing back with help from its private sector companies like Space X and Blue Origin and dozens of smaller operators. The White House Space Priorities document is clear that "a robust space program enables us to expand our alliances and partnerships and underpins our military strength."

The document outlines a plan which will see renewed exploration of the Moon, Mars, and beyond. It says it will reinforce the space-related critical infrastructure of the country and defend itself against "the growing scope and scale of space and counterspace threats". As part of this, it will leverage its new commercial space capabilities and services to meet national security requirements.

In December 2019, the US had established a Space Force and the next year, it had come out with its Defence Space Strategy which noted that "space is now a distinct warfighting domain" whose goal would be "to compete, deter and win in a complex security environment characterised by great power competition."

The US remains a world leader in space technologies, a fact underscored by the deployment of the new James Webb telescope, a hundred times more powerful than its predecessor Hubble.

The American DSS is quite straightforward in viewing China and Russia as "the most immediate and serious threats" though it does talk of North Korea and Iran as well. It says that the Chinese and Russians are aware of the American dependence on space "and have developed

doctrine, organisations and capabilities” to deal with them. For its part, the US is determined to develop its space power “to ensure space superiority and secure the Nation’s vital interests.”

India’s concerns relating to space are not very different from that of Britain, since both of them are venturing somewhat late into the arena of military uses of space. New Delhi has considerable depth in space activities but it could draw a lesson or two from the British thinking in this area. In 2019, the government set up a Defence Space Agency and a Defence Space Research Organisation, but has baulked in setting up a fully-fledged Space Command. As of now, India has a number of GSAT series satellites which provide secure communications for its military. Besides imagery satellites, India has a number of synthetic imagery satellites exclusively for defence use. Many of the assets—surveillance and communications satellites—that the military uses are operated by ISRO. But there could be circumstances, especially during war, when these should be under direct military command. In 2019, India took a big step in conducting an integrated space warfare exercise which focused on integrating space assets for military uses

Reports suggest that India is working in a range of areas relating to counter-space defence. In 2019, it conducted a direct ascent anti-satellite test, but it is also working on counter-space capabilities like directed energy weapons, co-orbital satellite systems as well as other means to protect its own satellites from electronic and physical attacks.

But India needs to worry that Chinese military space capacities, which is being developed for taking on the US, could have the ability to overwhelm our assets in conflict situations. New Delhi, therefore, needs to sharply step up its activities here and also reach out to friends like the US to boost its capabilities.

The views expressed above belong to the author(s).

<https://www.orfonline.org/expert-speak/space-race-outlining-space-strategies/>

THE JERUSALEM POST

Mon, 07 Feb 2022

Israel, Gulf States in discussions for air defense systems

The famed Iron Dome system is not the only system that could be on the table.

By Anna Ahronheim

As rocket and drone attacks against the United Arab Emirates have increased, talks are underway between Israel and several Persian Gulf states to understand what air defense systems are most relevant for the threats that they face.

Though Israel’s famed Iron Dome system has made headlines around the world for its interceptions during the numerous rounds of conflict with the Hamas-run Gaza Strip and has been touted as the system most likely to be sold to countries interested in such platforms, Jerusalem has a variety of air defense systems.

Discussions with the Gulf countries centered around shared threats such as rocket and drone attacks. The discussions allowed Israeli officials to understand that the Jewish State has other systems that may be a better solution to such threats.

Israel, the United Arab Emirates, Bahrain, and a number of other Arab countries signed normalization agreements in 2020 as part of the Abraham Accords, bringing years of covert contacts into the open.

The UAE has faced a number of missile attacks launched by Iran’s Houthi rebels in Yemen in recent weeks, including during the trip of Israel’s President Isaac Herzog to Abu Dhabi, and one in January that killed three foreign workers.

Other attacks were intercepted by American Patriot systems.

While the UAE has highly formidable medium-to-high altitude air defense systems, following the attacks both France and the United States announced that they would assist the country in defending itself against missiles and rockets.

Israel has also offered the UAE support against such threats and Defense Minister Benny Gantz recently returned from a historic trip to Manama where he signed the first Memorandum of Understanding with Bahrain.

The agreement will set a solid security cooperation framework that formalizes defense relations between the two countries, including increased cooperation in various fields such as intelligence sharing, military-to-military training, cooperation between defense industries.

The public meetings come as tensions with the Islamic Republic are at an all-time high, and missile attacks by their proxies in Yemen and Iraq against the United Arab Emirates have increased.

During his visit, Gantz said that the defense agreement “will contribute to the security of both countries and the stability of the region.”

The systems that may have been discussed include Rafael Advanced Defense System’s SPYDER mobile defense system and Israel Aerospace Industries Barak 8 Medium-Range Surface-to-Air Missile system.

The SPYDER, which was on display at IDEX 2021 late last year, has already been purchased by several other countries. The mobile system incorporates Rafael’s advanced Python-5 and I-Derby missiles to provide short, medium, and long-range protection against a range of threats including attack aircraft, cruise missiles, unmanned aerial vehicles, stand-off weapons and more.

The system, which uses electro-optical observation payload and wireless data link communication, can engage multiple threats simultaneously up to 80 kms. away in all weather conditions.

SPYDER has been sold to several international customers, including the Czech Republic.

The Barak-8 MR-SAM system is able to shoot down enemy aircraft at a range of 50-70 kms. The system is designed to defend naval vessels against a myriad of short-to-long range airborne threats like incoming missiles, planes, and drones at both low or high altitudes.

It is jointly developed by India’s Defence Research and Development Organisation (DRDO) in close collaboration with Israel Aircraft Industry’s Elta, RAFAEL. Additional companies in both countries are used by Israel’s navy as well as by India’s naval, air and ground forces.

The system integrates several advanced state-of-the-art systems including digital radar, a command and control system, tracking radar launchers, interceptors with advanced homing radio frequency (RF) seekers, data link, and system-wide connectivity. It is also able to engage multiple targets simultaneously in severe saturation scenarios and can be operated in all types of weather.

There are also reports that Morocco is interested in the system.

In addition, there are also several Israeli anti-drone systems that may be on the table, including Rafael’s Drone Dome which is described by the company as an “end-to-end system designed to provide effective airspace defense against hostile drones used by terrorists to perform aerial attacks, collect intelligence, and other intimidating activities.”

The all-weather system has a 360-degree circular coverage and is designed with an electro-optical/infrared sensor and radar, to detect, track and neutralize all types of UAVs that have been classified as threats to a distance of up to 10 km.

It can neutralize the drone by jamming radio frequencies to prevent the drone from being able to move, by aiming a high-pressure water gun at it or by a laser beam to destroy the hostile aerial vehicles.

<https://www.jpost.com/israel-news/article-695647>



Fri, 04 Feb 2022 6:56PM

Oman delegation visits Southern Naval Command

His Excellency Dr Mohammed Bin Nasser Bin Ali Al-Zaabi, Secretary General, Ministry of Defence, Sultanate of Oman along with a seven member delegation is on a two day visit to Kochi from 02 - 04 February 22. The delegation interacted with Vice Admiral MA Hampiholi, AVSM, NM, Flag Officer Commanding - in - Chief, Southern Naval Command, at Headquarters Southern Naval Command on 03 Feb 22 and held discussions on various defence cooperation issues with the Indian team

The delegation also visited Cochin Shipyard Ltd, the Indigenous Aircraft Carrier- Vikrant, professional trainingschools viz Navigational & Direction School and Diving School. In addition, the delegation also interacted with the Staff Officers of Southern Naval Command on various professional subjects. The delegation would be departing Kochi for Oman on 04 Feb 22. Prior to arriving Kochi, the delegation had visited New Delhi from 31 Jan - 02 Feb 22 and attended the 11th meeting of India-Oman Joint Military Cooperation Committee (JMCC), aimed at enhancing the defence cooperation between the two countries.



<https://pib.gov.in/PressReleasePage.aspx?PRID=1795568>

1945

Mon, 07 Feb 2022

India's nuclear weapons could kill millions of people

By Caleb Larson

India might be the nuclear weapons state many military analysts forget about. Nonetheless, New Delhi could start a nuclear war within just mere minutes: India's indigenously developed technology—and a lot of Russian hardware and help—all keep Pakistan and China at bay.

No-First-Use

“An NFU policy essentially constitutes a promise, backed by a survivable nuclear arsenal, to only use nuclear weapons in response to a nuclear attack,” explained a Carnegie publication. “The logic is simple and effective: you don't nuke me, and I won't nuke you. India and China both have declared no-first-use policies, whereas Pakistan and the United States, among others, do not rule out the first use of nuclear weapons in a conflict.”

Despite India's formidable nuclear arsenal, India had since 2003 maintained it will not use said weapons of mass destruction first, but strictly in a retaliatory manner for deterrence.

However, 2019, India called their no first use policy into question when Indian Defense Minister Rajnath Singh said that "Till today, our nuclear policy is 'no first use'. What happens in future depends on the circumstances." This curious statement is perhaps an example of deliberate strategic ambiguity.

Triad

India maintains a nuclear triad—that is a three-pronged nuclear weapon delivery system that utilizes a diverse array of means for delivering nuclear payload on target. New Delhi has air-launched nuclear missiles, land-based nuclear missiles, and most recently submarine-launched missiles.

Air

Air delivery was India's original nuclear delivery prong. Although speculative, it is believed that Indian SEPECAT Jaguars and Dassault Mirage 2000s are the primary (perhaps only) vehicles capable of delivering nuclear bombs from the air. It is also possible that Indian nuclear bombs are non-precision munitions that rely on impact to detonate.

Land

From land, India has a formidable missile launch capability intended to deter both China and Pakistan—though China especially rarely acknowledges India's nuclear missile capability.

In order to maintain a credible threat against China, India has pursued a strategy of improving their nuclear inter-continental ballistic missiles. This has been often done in tandem with Russia, despite the latter's partnership with China in other defense-related areas.

The Agni missile family forms the backbone of the land-based nuclear triad. Although the Agni-IV and Agni-V are still in development, once deployed they would comfortably be able to strike Beijing, though the Agni-II and Agni-III are very likely already capable of doing so.

The jointly Russian-Indian developed BrahMos hypersonic missile may also potentially be able to carry nuclear payload in the future, although this remains unconcrete and speculative.

Sea

According to a quoted CIA report, "Russia has significantly supported in developing India's nuclear programmes with technology and equipment, and become a main source of arms for the country," especially regarding the sea-based part of the triad.

What India's sea-based nuclear prong looks like is somewhat speculative as well, although the range of submarine-based missiles will likely be limited to below-1,000 kilometers, or approximately 620 miles.

Armed and Dangerous

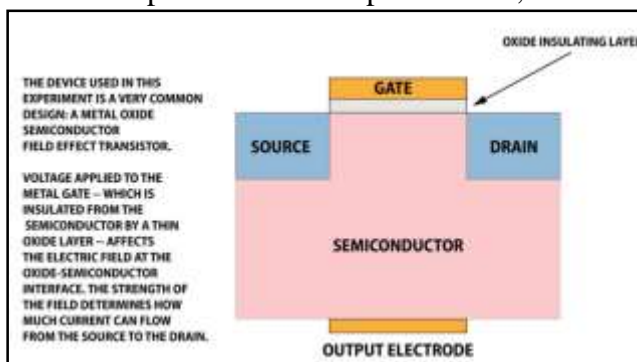
Overall, India's nuclear triad is a mix of capabilities—free-falling bombs, long-range and quite sophisticated missiles, and sub-launched missiles of unclear capabilities and likely limited range. Still, India is one of the preeminent nuclear powers in the region, behind China. Look to Russia for more developmental help in the future.

(Caleb Larson is a Defense Writer based in Europe. He holds a Master of Public Policy and covers U.S. and Russian security, European defense issues, and German politics and culture.)

<https://www.19fortyfive.com/2022/02/indias-nuclear-weapons-could-kill-millions-of-people/>

Resurrecting and improving a technique for detecting transistor defects

Researchers at the National Institute of Standards and Technology (NIST) have revived and improved a once-reliable technique to identify and count defects in transistors, the building blocks of modern electronic devices such as smartphones and computers. Over the past decade, transistor components have become so small in high-performance computer chips that the popular method, known as charge pumping, could no longer count defects accurately. NIST's new and improved method is sensitive enough for the most modern, minuscule technology, and can provide an accurate assessment of defects that could otherwise impair the performance of transistors and limit the reliability of the chips in which they reside.



Credit: National Institute of Standards and Technology

The new, modified charge pumping technique can detect single defects as small as the diameter of a hydrogen atom (one-tenth of a billionth of a meter) and can indicate where they're located in the transistor. Researchers could also use the new capability to detect and manipulate a property in each electron known as quantum spin. The ability to manipulate individual spins has applications in both basic research and quantum engineering and computing.

Transistors act as electrical switches. In the on position, which represents the "1" of binary digital information, a designated amount of current flows from one side of a semiconductor to the other. In the off position, representing the "0" of binary logic, current ceases to flow.

Defects in a transistor can interfere with the reliable flow of current and significantly degrade the performance of transistors. These defects could be broken chemical bonds in the transistor material. Or they could be atomic impurities that trap electrons in the material. Scientists have devised several ways to categorize defects and minimize their impact, tailored to the structure of the transistor under study.

In the traditional design known as the metal oxide semiconductor field effect transistor (MOSFET), a metal electrode called the gate sits atop a thin insulating layer of silicon dioxide. Below the insulating layer lies the interface region that separates the insulating layer and the main body of the semiconductor. In a typical transistor, current travels through a narrow channel, only one billionth of a meter thick, that extends from the source, which lies on one side of the gate, to a "drain" on the other side. The gate controls the amount of current in the channel.

Charge pumping is a two-step process in which the examiner alternately pulses the gate with a positive test voltage, then a negative one. (The transistor does not act as an on/off switch during this testing mode.) In traditional charge pumping, the alternating voltage pulses are applied at a single, set frequency.

In the first step of the test, the positive voltage attracts or pumps electrons, which are negatively charged, to the boundary or interface between the gate's insulating layer and the body of the transistor. Some of the pumped electrons become trapped in defects at the interface, but there are

many electrons left over. In the second step, a negative voltage is applied, to rid the interface of the excess electrons, leaving only the trapped ones behind. The negative voltage also attracts positive charge carriers, known as "holes," to the region, where they combine with electrons trapped in the defects. This activity generates a current proportional to the number of defects. The greater the output current, the larger the number of defects.

In the recent past, the current was indeed a reliable measure of defects. However, the insulating oxide layer in modern transistors is now so thin—just 10 to 20 hydrogen atoms wide—that an effect from the realm of quantum mechanics comes into play, confounding measurements using the traditional charge-pumping method.

According to quantum theory, electrons and other subatomic particles can never be truly trapped; there's always some probability they will escape or "tunnel" out of an enclosure or boundary layer. The thinner the material, the higher the probability that electrons will escape, creating a tunneling current. As transistor dimensions shrank, the tunneling current leaking through the insulating oxide layer made it nearly impossible to detect defects with ordinary charge pumping. Scientists all but abandoned the technique.

NIST researchers James Ashton, Mark Anders and Jason Ryan have now found a way to salvage the technique so that it not only works for ultrathin transistor components but is also more sensitive, enabling scientists to record signals from a single defect. The solution arose when the scientists came to a key realization: The current that results from quantum tunneling remains virtually the same, regardless of the frequency at which charge pumping pulses the positive and negative voltages.

Armed with that knowledge, the team revised the charge pumping technique by alternately applying the method's positive and negative voltages at two different frequencies rather than the single frequency used in the traditional method. Applying the voltages at two different frequencies gave the researchers two different output currents. By subtracting one output current from the other, the constant signal from the quantum tunneling current dropped out. With the confounding tunneling current eliminated, the researchers were able to detect defects in transistors with ultrasmall features. The researchers reported their development of the frequency-modulated charge pumping technique online in the Feb. 2 *Applied Physics Letters*.

"We've given charge pumping a new lease on life," said Ashton.

"The modulated-frequency technique is now useful for looking at single interface defects, which gives engineers control of single electron charges in a very sensitive measurement scheme," he added.

Since only one electron is involved, the output current is equal to multiples of the electron's charge, a fundamental physics constant calculated by NIST and other institutions.

Because the method can detect single electrons, it may serve as a sensitive probe of an electron's quantum spin. Modulated-frequency charge pumping may provide a valuable guide to scientists who are now exploring how electron spin might store and transfer information in a computer of the future. It may also prove useful in quantum metrology, as a potential new way of determining a quantum standard of electrical current.

More information: J. P. Ashton et al, Detection of individual spin species via frequency-modulated charge pumping, *Applied Physics Letters* (2022). [DOI: 10.1063/5.0081172](https://doi.org/10.1063/5.0081172)

Journal information: [Applied Physics Letters](https://phys.org/news/2022-02-resurrecting-technique-transistor-defects.html)
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