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समाचार पत्रों से चयित अंश Newspapers Clippings

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

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CONTENTS

S. No.	TITLE	Page No.
DRDO News		1-14
DRDO Technology News		1-12
1.	Pune: DIAT, SETS hold joint workshop on quantum security, FPGA	1
2.	Apart from making missiles and rockets, now DRDO is also transferring technology	2
3.	Govt. must consider reintroduction of tax incentives for R&D in defence: Jayant D. Patil, L&T	3
4.	Indian Navy arrives for joint exercises	11
COVID 19: DRDO's Contribution		12-14
5.	4 ऑक्सीजन प्लांट जल्द होंगे शुरू: 6 महीने बाद प्रतिदिन मिलेगी 26 लाख लीटर ऑक्सीजन, 15 दिनों में एमसीएच हॉस्पिटल में पहला प्लांट होगा चालू	12
6.	उम्मीदों के निष्कर्ष	13
7.	झांसी मेडिकल कॉलेज और बरुआसागर सीएचसी को मिला आक्सीजन प्लांट, विधायक और मेयर ने किया लोकार्पण	14
Defence News		15-27
Defence Strategic: National/International		15-27
8.	Increase in budget for Army	15
9.	Indian Naval Ships Shivalik and Kadmatt at Brunei to enhance bilateral ties	16
10.	भारतीय नौसेना के जहाज शिवालिक और कदमत द्विपक्षीय संबंधों को आगे बढ़ाने के लिए ब्रुनेई पहुंचे	17
11.	Indian Army contingent to participate in International Army Games – 2021 in Russia	18
12.	रूस में आयोजित होने वाले अंतरराष्ट्रीय सैन्य खेल- 2021 में भारतीय सेना का दल भाग लेगा	18
13.	Offensive defence: Army to ready its first set of new battle groups by September end	19
14.	Indian Air Force deploys 'Garud' commandos near the contested border despite India, China truce	20
15.	Editorial: Indian Navy's Atmanirbhar moment	22
16.	India, Israel hold 'fruitful discussion' to deepen defence, industrial ties: Defence Minister	23
17.	Indian Navy destroyer arrives in Saudi Arabia for maiden Naval exercise	24
18.	Exercise Cutlass 2021: Prospects of alignment of Indo-U.S. interests in the Western Indian Ocean	25
Science & Technology News		27-33
19.	Explained: India in real-time and hi-res. How ISRO'S Gisat-1 will be a 'game-changer'	27
20.	Physicists have built a mathematical 'playground' to study quantum information	29
21.	Qubit in a crystal lattice of boron nitride is a suitable sensor	30
22.	Researchers design three-dimensional kirigami building blocks to make dynamic metamaterials	31
COVID-19 Research News		32-33
23.	Modified tapeworm drug may help treat Covid-19: Study	32



Tue, 10 Aug 2021

Pune: DIAT, SETS hold joint workshop on quantum security, FPGA

This one-week workshop is being attended by over 30 participants who are in the area of quantum technology, followed by the hands-on training and discussions in the developments of Quantum Key Distribution

Pune: The Defence Institute of Advanced Technology (DIAT), Pune, and Society for Electronic Transactions and Security (SETS), Chennai, are jointly conducting a workshop from August 9 to 14 on Field Programmable Gate Array (FPGA) and post-processing for Quantum Key Distribution (QKD).

Quantum Key Distribution is one of the most advanced areas for secure communication and is a challenging technology for many countries. Post-processing of data using innovative FPGA techniques is an essential requirement for deriving usable information from QKD. This one-week workshop is being attended by over 30 participants who are in the area of quantum technology, followed by the hands-on training and discussions in the developments of QKD.

In an important milestone for defence technology in December last year, QKD technology developed by the Defence Research and Development Organisation (DRDO) had undergone trials between two laboratories in Hyderabad where the quantum technology-based security was validated for a range of 12 km over a fibre optic channel.

<https://indianexpress.com/article/cities/pune/diat-sets-hold-joint-workshop-on-quantum-security-fpga-7446486/>

Apart from making missiles and rockets, now DRDO is also transferring technology

In the last three years, DRDO laboratories located across the country have taken forward the work on many such weapons from fighter aircraft to cruise missiles. Along with this, DRDO is also associated with the Accelerated Technology Assessment Commercialization (ATAC) started by FICCI at this time.

Defense Research and Development Organization (DRDO), which is an important institution for the armies, is currently working on many such research and development projects, the benefits of which will be visible in the next few years. In the Lok Sabha, information has been given by the government about the projects on which the organization is working at present. In which of his labs, which project is going on, it has also been told in detail by the government. The government has presented the figures of the last three years in the House.

From missiles to AI based systems

DRDO's branch Aeronautical Development Agency (ADA) is currently working on 4 projects. ADA is the same organization that is working on light fighter jets like Tejas for the Air Force and Navy. It has been told by the Ministry of Defense that at present DRDO is working on these projects:

- Missile Systems
- Airborne Early Warning and Control Systems
- Fighter Aircraft
- Armored Fighting Vehicles
- Bridging and mining systems
- Guided weapons
- Cannon and Rockets
- Small arms and ammunition
- Advanced Torpedoj and advanced sonar suite
- Electronic Warfare
- Long-range radars
- Artificial based on intelligence systems
- Sonar and Torpedoj
- Autonomous System
- Idblu system

How much did DRDO benefit from ToT

In the last three years, DRDO's laboratories located across the country have taken forward the work on many such weapons from fighter aircraft to cruise missiles. Along with this, DRDO is also associated with the Accelerated Technology Assessment Commercialization (ATAC) started by FICCI at this time. This program is related to the commercialization of DRDO's technologies.

In three years, DRDO has completed 91 such agreements which were related to transfer of technology with industries. For this, DRDO had received Rs 11.98 crore as a fee. DRDO Chairman Dr G Satheesh Reddy has said that at this time there is a dire need to explore new trends in technology. These trends are very important for the world class test range at the moment.

Big responsibility on DRDO

In order to promote the defense industry in the country, the government started 'Make in India' in the year 2014. Apart from this, many efforts were made by the government to encourage the country's defense industry under 'Atmanirbhar Bharat' launched in the year 2020. According to the government, by adopting reforms through indigenous design, the development and manufacturing of defense equipment in the country has been taken forward.

Apart from this, priority was given to domestic vendors in the Defense Procurement Process (DAP) 2020. The government has also increased the fund for domestic purchases as compared to earlier and plans to increase it to Rs 71,438.36 crore. In the coming few years, the big responsibility of preparing weapons for the armies is going to come on DRDO.

Indigenous equipment preferred

It has been said on behalf of the government that in the data which it has received from the Controller General of Defense Accounts (CGDA), detailed information has been given about the purchase of defense equipment. Apart from this, the equipment purchased by the three armies in the last 3 years also shows that imports are coming down. According to the information shared by the government, defense equipment was purchased in 2018-2019 for Rs 93474 crore.

Out of this, goods were purchased from domestic producers for Rs 50500 crore. Similarly, from Rs 108340 crore in 2019-2020 and Rs 63722 crore to domestic manufacturers and in 2020-2021 Rs 139341 crore was spent on defense equipment, out of which Rs 88632 crore came in the share of domestic companies.

<https://www.eletimes.com/apart-from-making-missiles-and-rockets-now-drdo-is-also-transferring-technology>

BW BUSINESSWORLD

Tue, 10 Aug 2021

Govt. must consider reintroduction of tax incentives for R&D in defence: Jayant D. Patil, L&T

By Manish Kumar Jha

Time-lags have proved a hurdle for defence equipment procurement in India, which is why the private sector L&T Defence's ahead-of-schedule delivery of 100 of the K9 Vajra to the Indian Army is path-finding. L&T Defence heralds a new chapter in defence production in India, standing out as a leader with next-gen technology that ranges from the potential light tank to next generation submarines under the P75 I. Jayant D. Patil, Whole-time Director and Sr. Executive VP (Defence & Smart Technologies) - L&T, is a key force behind these game-changing initiatives and unprecedented transformation that the Indian defence industry is witnessing. In a free-wheeling chat with BW Businessworld's Manish Kumar Jha, he addresses wide-ranging topics on technological innovation for the Indian Armed Forces.



Jayant D. Patil, Whole-time Director and Sr. Executive VP (Defence & Smart Technologies) - L&T

In the most comprehensive account of L&T's defence and smart technologies, Jayant D. Patil speaks on the entire range of projects and breakthrough technological prowess across—from the land forces to the critical naval projects. The innovation in the defence industry and the thrust on the R&D from the Government to the Private Industry will be the factor for India's economic

growth. Defence economy will drive and unfold such opportunities. Discussion ranges on: Light tank, Network of Spectrum (NFS), Battlefield Management System, Tactical Communications System, UAVs & CUAS, R&D, P75 I submarines, Warships and Nuclear submarines among others.

What's next for L&T after the successful K9 Vajra project? Even as you wait for your next order, how do you keep the partners that you worked with on this project engaged in the interim? Is there any new technology and weaponry that you have added to the K9 Vajra beyond the first successful delivery?

JD Patil: After completing deliveries of all 100 K9 Vajra gun well ahead of schedule, we have been anticipating further orders in Artillery and Armoured Systems domain. We have created a world class facility for manufacturing, assembly and testing of the Artillery and Armoured systems at our Armoured Systems Complex (ASC) in Hazira near Surat.



L&T's jayant D. Patil with Indian Army Chief Gen MM Naravane

L&T had started the journey of indigenisation, right from the inception of the K9 Vajra program, by replacing fourteen critical systems in the Korean 'K9 Thunder' with indigenously developed and produced systems for the trial gun fielded for user evaluation trials, thus giving birth to the Indian

version K9 VAJRA - a bespoke solution – custom built for harshest operating conditions and combination of requirements for Indian User. The VAJRA variant developed by L&T with India-specific features emerged fully compliant to Indian Army's needs during the arduous and extended field evaluation trials. Having indigenously built 83% of work-packages for this program, team L&T Defence accomplished our inherent potential into track-record capability and empowered us develop & realize variants with enhancements as per the custom requirements of the End Users elsewhere as well as for our own Armed Forces.

While we await further orders we worked with the User for enhanced capabilities to the Vajra and make it terrain agnostic for the User. Also, we have continued to work on concepts to design other armoured systems with support of our foreign partner. On ground, the modular workstation concept to which the ASC has been built is being kept engaged with other weapon and engineering systems projects at hand and accelerate deliveries of these systems to the User given that our borders have turned active.

To prove the modularisation and agility aspect of the ASC Hazira and our PMSC complex at Coimbatore, we responded to the Nation's call during the second wave of the pandemic and absorbed DRDO technology to produce Medical Oxygen Plants for the "PM Cares fund". Having been ordered 249 plants in the middle of May 21, we have already realised, tested and certified 175 new plants (nearly half already delivered and expect to deliver all the plants on order by end of July 21 and empower the Nation for the impending third wave. The skill agility to integrate complex technologies, speed, scale of production (thanks to the supply chain and inhouse robotised production lines) overwhelmed the other Govt agencies readying the sites for receiving the MOP plants.

However, our heart goes out to watch gradual withering away of the painstakingly developed supply chain of more than 1,100 supply chain partners of the ASC especially during the pandemic times while they ecosystem is fully competent to scale up production of not just further K9 Vajras but also other tracked armoured systems. While we are working on some export leads the pandemic not sparing any nation across the globe is proving to be a major constraint. Repeat orders for further K9 Vajra / other armoured systems are thus an urgent need and the decision makers are fully seized of the same.

What is the status of the light tank programme where DRDO is pursuing a partnership with L&T? The need for a light tank is an immediate and urgent requirement of the Offensive Mountain Corps (OMCs), but the “weight versus capability” criteria of the Army seems to be the key challenge. Do you see a breakthrough emerging for L&T in this case?

JD Patil: As mentioned above we are working on multiple concepts having been engaged to indigenously developing the FICV since more than a decade back alongside the Vajra program. We believe that we have the requisite capabilities, infrastructure, skillsets and ability to manage and scale up production for mega programs in place as also appropriate partnerships to accelerate the development / customisation and realisation of class of platform systems such as FICV, Light Tank and FRCV.

Along the capability to upgrading the existing armoured systems with indigenous architecture and know-how, we don't believe the challenges put up by the User are unsurmountable to achieve.

Do you think it is possible to integrate the light tank with the Tactical Communications System (TCS) and the Battlefield Management System (BMS) within 25 tonnes as specified? Are these parameters achievable?

With advent of electronics and miniaturisation communication systems and decision support systems can be truly made light today. Fact on ground is that the BMS program under Make was shelved by MoD for budget constraints and the TCS development is yet to be awarded to the two development agencies selected many years back. As to the integration of these into the Light tank, if the architecture of the Tank is keeping in tune with latest advances in electronics and does incorporate a digital communication BUS for all systems to communicate with it, the modularity and upgradability of the tanks can be architecturally inbuilt. This is similar to the IPMS in today's Naval platforms.

A digital communication BUS can enable fully transparent armour and convert the tank in to a remote station with crew under the safety of the armour and even enable a remote controlled (unmanned) armoured systems.

“On the Light tank RFI, we are midst analysing the requirements and evolving a solution that would best addresses the requirements of the End Users. Any such complex system conceptualisation would involve trade-offs & version mix in view of physical limitations of Tank internal volume envelop w.r.t. to the performance needs.”

How is the Network of Spectrum (NFS) project unfolding for the Indian Army which aims to unify the entire network? How will it transform the operational capabilities for building next generation smart army?

JD Patil: As part of Network for Spectrum (NFS) arrangement Defence has surrendered 40 megahertz (MHz) of spectrum to the Department of Telecommunications (DoT) 25MHz in the 3G band and 20MHz in the 2G band. The NFS project was envisaged to on one hand release the spectrum (as a national resource) for commercial exploitation and on the other hand boost and securing the communication capabilities of the Defence Forces by providing a dedicated & enhanced tri-service communication network for better operational jointness. Bharat Sanchar Nigam Limited was appointed as nodal agency for implementation of the various Projects under the NFS program.

Broadly, the NFS network comprises Optical Media Layer, GIS based Optical Fiber Network Management System, DWDM Backbone Layer, IP MPLS backbone Network to make the network secure, and scalable with secured bandwidth at each station, Microwave Radio & Satellite Layer and the Unified Network Management System (UNMS) Layer as a common management platform.

In March 2020, L&T's Smart World & Communication (SW&C) Business was awarded a contract for a first-of-its-kind, state-of-the-art Unified Network Management System (UNMS) to better manage & monitor the network operations and deliver high quality of service through Next

Generation Operation Support System (NGOSS) solution. The UNMS architecture allows management of multi-vendor, multi technology components and devices in the network in a secure manner.

The project involves the creation of a resilient Cloud based IT infrastructure, Network Operation Centres for network services, monitoring & Control involving setting up of multiple Tier III Data Centres with state of the art capabilities including Cyber Security solutions and services in the form of Security Operation Centre to provide robust, watertight cyber and communications security.

The centralized intelligence with decentralized views and management capabilities including visualization and analysis tools, fault management, network performance analysis will Improve operational effectiveness and efficiency in managing assets to provide effective & secure communication network for the Armed forces.

Despite the challenges posed by the pandemic globally, the project an accelerated implementation track with the joint and unstinted efforts of the User, L&T & BSNL and is being expedited for earliest completion.

Last year you had announced the development of indigenously developed unmanned systems, hi-tech drones and anti-drones (UAVs) integartaed solutions in collaboration with ideaForge. Have you come up with any viable solutions for the military, which is in urgent need of such air -defence solutions in the wake of the recent drone attack in Jammu?

JD Patil: L&T is focussed on development of Unmanned / Autonomous systems across domains spanning across Land, Air, surface Seas and Underwater for range of uses including surveillance, analytics, serving as autonomous targets. We also engage with multiple startups and SMEs such as ideaForge and more. These relationships have been extremely useful in our smart city / safe city domain during the Covid pandemic times. Innovation in deployment of drones proved very efficient means to control monitoring social distance in public spaces, enforcement of lockdowns, thermal mapping of crowds and heat maps of crowd density.

L&T has been a trusted partner to DRDO and the counter drone systems is not a domain of exception. While we have been a partner to DRDO for development of few major building blocks, we have also expressed our keen interest against the latest EoI from DRDO for acquiring the ToT and scale up the deployment of counter drone systems. Concurrently, we have integrated a counter drone system solution, offered it against Multiple RFIs under different stages of discussions / acquisition and are in the process of developing an indigenous solution encompassing both RF guided as well as autonomous drone detection as well as Kill solutions.

How is the P75 I submarines programme progressing for L&T? Could you give us the sense of the investment in technology and assembly infrastructure that L&T will infuse into the programme? What are the elements of technology (ToTs) that L&T is looking at from foreign partners? What about some of the other major hurdles such as the AIP system and greater firepower than the Scorpene class?

JD Patil: As we speak, post clearance by DAC on 04th June'21, the RfP for P75(I) is in the final stage of finalization and expected to be issued soon. We, at L&T, have been preparing for this Program since 2002-3 as Navy and MoD embarked upon the path of Navy's 24 perspective plan to build 24 submarines by 2030 and clearance by CCS to build them indigenously in two lines of construction. Having built a domain specific track record and firm beliefs in development of Indigenous technologies to build Underwater platforms, we have been building the organizational capabilities, Infrastructure, Skills, Talent, Processes and technologies to build submarines indigenously.

L&T's technological capabilities and infrastructure have been primed for submarine construction through its three decades long association and experience in engineering & construction of strategic underwater platforms of India. In fact, L&T's competencies and infrastructure in this field are completely differentiated in the country, especially in the facets of detailed design, development of indigenous technologies in critical fabrication and system

integration of underwater platforms. Since the build philosophy of the P75(I) submarines is going to be modular, that we practice in inhouse warship design and construction in our mega shipyard, we may require to learn and imbibe the modular fabrication of Submarines as well as design, production and integration norms besides minor infrastructural augmentation in consultation with the Foreign Collaborator (FC) of choice.

As we understand, the P75(I) program is aimed at receiving ToTs from the FC in the areas of Functional Design, Detailed Design, Construction and Maintenance. L&T's track record in all these domains as well as our inhouse ability to design and develop platform specific equipment and systems and support these through the life would differentiate us to be able to add value to the User and better fulfill the RfP mandate during the course of the Program. However, it is pertinent to mention here that L&T is fully capable of undertaking the construction of submarines and would not have to depend significantly on the Construction ToT be it in understanding the metallurgy of the materials used, processes, Jigs, Fixtures, Tooling and Industry 4.0 practices.

“The requirement of AIP has always been a part of the P75(I) program and known for long years. Thus, the shortlisted FCs are all well aware of the same and been evolving their own technologies to address the same. With advanced levels of maturity of range of AIP technology solutions that the FCs are currently at, we do not believe it to be a major hurdle. “

“Also L&T's association in partnering DRDO (NMRL) in development of indigenous AIP as principle integrator, we believe we should be able to deal with the variety of AIP solutions on offer by the FC's and chose the one that best meets the User requirements combined with winability of the program for L&T.”

Similarly, we are given to understand that the firepower requirements have been extensively discussed with the FCs at the EoI stage and as far as we know, all of them have conveyed their compliance to the requirements. Also we believe, L&T's maturity in design and development of wide range of Naval weapon systems including Antisubmarine, Anti-ship, Land attack warfare will provide us an edge.

We now await the receipt of the formal RfP and upon study of final requirements finalise our strategy, partnership with FC and respond in desired timelines.

Based on years of design level work for India's nuclear powered ballistic submarines, time has come for the indigenous effort on nuclear powered attack submarines. Does L&T intend to strive that benchmark in embracing such effort? Any talks with GOI on this?

JD Patil: L&T's association with the strategic program dates to mid-eighties through development of a series of platform-specific equipment and systems. L&T has thereafter remained engaged with the program for development of host of indigenous technologies, detailed design and construction.

The indigenisation in the strategic submarine program has been extremely high and has attained unprecedented levels, in multiples of those achieved in any complex hi-tech defence platforms produced in India, with the exception of some very recent warship building programs.

(SSBN: It is a Ship Submersible Ballistic Nuclear Submarine. SSBN's are those class of submarines which can remain deep beneath the ocean making them virtually undetectable for months, they also carry nuclear-tipped ballistic missiles.)

L&T, in association with, and enabled by the Program, has established a track record of formidable indigenous capabilities including in-house development of technologies, submarine specific Steel alloys, plates and forgings, Production processes, jigs-fixtures and tooling, skill development for indigenous construction of submarine hulls as well as engineering equipment, weapon complex, PGD and control systems and platform integration through 'Industry 4.0' digital processes.

L&T has established a dedicated submarine design & engineering center for detailed design & engineering of hull, engineering and electrical systems. The center equipped with a virtual reality studio and state-of-the-art digital and automation tools has proved to be the nerve center to achieve high levels of first time right with detailed planning and sequencing being done in the digital

domain as also leveraging the digital twin approach. L&T's work centres have been ab-initio developed indigenously and matured to undertake 3D-assisted outfitting as well as quality control, system integration and system-level tests & trials.

Thus, L&T holds some unique capabilities in the underwater domain that, thus far, remained to be brought in under ToT in India. A few examples of such capabilities are,

1. Technologies, processes, methods and tooling for complete pressure hull fabrication using a range of alloys used in eastern as well as western philosophies of submarine building,
2. Torpedo Weapon Complexes,
3. Solutions for handling of megablocks in multiple thousands of tonnes,
4. Ship Lift to handle docking / undocking of vessels upto 21500 ton in a couple of hours,
5. Development and Manufacturing of a range of platform-specific equipment, etc.

With these established competencies, capabilities and infrastructure, L&T is well-prepared to meet the requirement of realization of indigenous submarines and achieve high levels of indigenization and break free from ToTs for future submarine building programs.

How does the MoD support for the private sector defence industry in the way of grants for R&D compare with that of DPSUs and the DRDO which are supported to the scale of around Rs 25,000 crore?

JD Patil: L&T's journey into the Strategic sectors commenced more than five and a half decades ago. The inception as far as Defence sector is concerned, was activated in the corporate R&D of L&T which dates back to early 70s. It was unprecedented at the time, for a company the size of L&T, then, to have a full-fledged DST accredited corporate R&D with technical experts focused on in-house development of contemporary technologies, pilot plants and prototyping facilities to offer differentiated turnkey solutions with performance guarantees to the customers. This R&D assumed the role of an 'incubator' for several in-house start-ups including Defence, which over the years transformed into business verticals of L&T as we see today and paving way to knowledge driven businesses with little dependence of external sources of knowledge / technologies. These initiatives of growing the business through focus on R&D was made as an in-house decision by L&T without relying on support from Government agencies for R&D funding.

L&T in mid-eighties associated with Defence Research & Development Organisation (DRDO) and also participated in the Naval indigenisation programmes funded by them, one and a half decade ahead of opening up of the Defence Production for private Industry participation. This association contributed to a series of success stories in indigenous development of equipment and systems over the years and L&T built trust amongst the End Users which paved way for our involvement in newer and complex developmental programs. This approach to R&D was unconventional and not through direct funding by the MoD to L&T.

"The policy directives currently in vogue for promulgating R&D efforts in the private defence industry comprise of only two major initiatives, namely the iDEX and Technology Demonstration Fund. "

iDEX strives to promote innovation and R&D for smaller solution offerings and amongst startups with a maximum cap of Rs.1.5Cr per initiative and the entire funding being around Rs.500 Cr only. The Technology Demonstration Fund (TDF) on the other hand seeks to meet the innovations for bigger challenging initiatives and a cap of Rs.10Cr per initiative is made available.

"However, it would be pertinent to cite that TDF is also routed through DRDO and not directly to the Private Sector. While both these schemes are right in their positioning they can hardly be harnessed to do serious systems / platform development through access to MoD funding, irrespective of direct route through iDEX or through DRDO for TDF."

The Defence Acquisition Policy on the other hand provides a framework for enabling the funding for Private Sector through its Make-I Category of acquisition where upto 90% of the prototype funding would be released in a phases manner.

“However, despite multiple acquisition cases being initiated under this category, not even a single one has taken off as on date, however the MoD leadership has recently assured at least five Make-I programs to be awarded every year here--onward.”

In view of the above, despite a proven example like L&T which could enable itself to make a significant footprint in the defence sector through in-house R&D, there is an urgent need to provide a larger opportunity for Private industry to contribute to the Defence sector.

However, going forward the government must consider reintroduction of tax incentives for R&D in targeted strategic sectors to Indian economy. Such incentives were prevalent till 2015 wherein R&D funding in new product and technology development in a DSIR recognised R&D centre were allowed accelerated Tax exemption up to 200% of the investment made. This was an industry friendly policy and paved way to nationalist companies like L&T to fund their own R&D.

L&T joint ventured with European MBDA Missile Systems to offer advanced missiles and missile systems to the Indian Armed Forces through domestic production. What kind of advance system to be offered? Export opportunity?

JD Patil: L&T’s relationship with MBDA has progressed from co-operation, collaboration to partnership over the last decade. We have established a Joint venture company named ‘L&T MBDA Missile Systems Limited’ (LTMMMSL) during 2017. The initial period has been invested in capability and capacity development.

MBDA is world’s largest exporter of advanced weapon systems (Missiles and PGM). LTMMMSL has access to most advanced weapon system technologies and positioned to offer the select ones to suit the needs of Indian Armed Forces. LTMMMSL have already offered a short-range air defence Missile system to enhance point and area defence maritime capabilities of Indian Navy’s in-service warships. LTMMMSL has also responded to the requirements of Medium Range Anti-Ship Missile system for Indian Navy and is offering the globally acknowledged Exocet missile system. LTMMMSL is also positioned to offer the niche technology 5th Generation Anti-tank Guided Missile (ATGM 5) to Indian Army as well as to Special Forces.

LTMMMSL is currently engaged on exports of missile subsystems and launchers from its greenfield facility in an SEZ at Coimbatore and has exported air-to-air missile launchers that are also being fitted out on Rafael Fighters for IAF. This facility was created with start of work in later half of 2019 and commissioned during the pandemic after series of national lock downs and deployed digital processes for training and skill building under active guidance by MBDA team in UK and France for the assembly integration and testing.

How can India be a shipbuilding hub, building warships for others, positioning India as a real security provider in the Indian Ocean Region and beyond? What kind of policy support can enable this?

JD Patil: Defence Sector opened up for Private Sector participation in 2001 and licensed in 2002. However, all major Warship programs continued to be awarded to the DPSUs on nomination basis until recent years.

If one sees this period in segments nil RFPs were issued on competitive basis for first five years, the next five years over FY06 to FY11 witnessed 95% programs by value nominated and 5% under competitive basis. Over this period Private sector shipyards won all the programs offered on competitive basis. The subsequent decade until FY21 saw just about 15% programs by value under competitive basis (85% programs by value stayed nominated). Of these private sector won just about 5% and DPSUs won 10% as Govt owned yards learnt to bid minor programs very competitively (having lost all programs in previous 5 years) while the majority order book stayed nominated and enabled the same.

We have seen a significant change over past five years as multiple RFPs have been tendered out in competitive mode but these have been all for auxiliary vessels and just one weaponised class of ship (NGMV).

“While this is a big positive for the shipbuilding sector as competition drives efficiency and price discovery, an impartial level playing field for fair competition is yet to be accorded to Private

Sector Yards. This is visible from the fact that three of the four major Private Shipyards have gone bankrupt due to lack of orders and consequent idling of capacity leading to non-performance / debt trap denying them ability to service the investments made in creating assets over the past decade.”

On the other hand, the Govt owned yards have continued to grow their order books that will last them between 11 to 16 times current revenues with the exception of one that has an assured large nominated program in the pipeline.

MoD’s experience with performance of Private shipyards has been a mixed bag, with extremes of delight as well as sheer frustration. While L&T has consistently delivered 61 vessels against four contracts with the last and 62nd scheduled to be delivered this month, all ahead of schedule to Coast Guard & Navy, most other yard faltered on their deliveries as bankruptcy got invoked, with the exception of some minor shipyards. Navy and MoD, in line with GoI’s initiative to enhance Private Sector participation, have been at work over past two years on evolving norms for shortlisting competent yards, both Private and Public. These are reflected in the significant amendments in DPP16 that mandate upfront Capacity assessment including compliance to both Technical and Financial parameters of the Yards. While RFPs are issued only to the Technically Qualified Entities, clearing the Financial Assessment is mandatory before commencement of Technical Evaluation. Significant features of these amendments stipulate minimum turnover requirement and Financial credit ratings that the Yard must have to be shortlisted for issuance of any RFP. L&T’s shipyard has been technically assessed and graded Cat A, signifying L&T’s ability to bid for all classes of weapon intensive ships, submarines as well as auxiliary vessels.

Thus, it can be seen that MoD is moving on a firm path inclusion of Private enterprise and implementing corrective measures in the policy to ensure fair competition. These address nomination issues going forward except the Govt owned yards enjoying asset servicing costs benefits as their asset (capacity) creation was through MoD Grants as well as multiple ToT benefits. The Pvt. Yards, on the other hand, have to fund asset creation as well as servicing the assets created through debt financing and have only to rely on their efficiency, new age digital processes and Innovation to achieve better conversion costs, a must to continue to survive.

In addition to the above, expediting order placement on shipyards in a balanced manner ensuring capacity loading across the public and private yards can improve the overall efficiency in Shipbuilding. With on time delivery track record in the domestic market our yards can harness opportunities in the global market as well.

With formation of QUAD, India has assumed a responsibility to be the security provider in the region as also maintain global order. This by itself can grant India an opportunity to be the hub for Naval Shipbuilding with regional players sharing the resources to maintain peace and tranquillity in the region. For this India needs to use defence diplomacy to its advantage by leveraging the nimble footedness of Private Enterprise in Shipbuilding.

<http://www.businessworld.in/article/Govt-Must-Consider-Reintroduction-Of-Tax-Incentives-For-R-D-In-Defence-Jayant-D-Patil-L-T-/09-08-2021-399913/>

Indian Navy arrives for joint exercises

By James Kon

Indian Naval Ships (INS) Shivalik and INS Kadmatt arrived in Brunei Darussalam yesterday for joint exercises with the Royal Brunei Navy (RBN).

The INS Shivalik commissioned in 2010, is the first Stealth warship built by India. It is armed with Klub and the Brahmos Supersonic anti ship missiles, Shtil and the Barak Anti-Aircraft missiles, 90R anti-submarine missiles and DTA-53 Torpedoes.

The ship also carries two helicopters for expanded combat capabilities spanning from sub surface, surface and air domains.

Meanwhile INS Kadmatt, commissioned in 2016 is an anti-submarine warfare corvette ship equipped with a number of noise reduction features and an array of aerial cum underwater sensors, electronic warfare systems and KAvach Decoy System along with a wide range of weapons including a 76-millimetre main gun, Barak 1 missile systems, torpedoes and rocket launchers.

The ships will stay in the country until August 12. INS Shivalik is commanded by Captain Kapil Mehta and Commander RK Maharana is the Commanding Officer of INS Kadmatt.

The Indian High Commissioner to Brunei Darussalam Ajaneesh Kumar welcomed the vessels in a port ceremony that followed COVID-19 protocols.

The high commissioner said the two ships visiting Brunei just a few days before India commemorates 75 years of her independence on August 15 and at the time when the Sultanate is celebrating the 75th birthday of His Majesty Sultan Haji Hassanal Bolkiah Mu'izzaddin Waddaulah ibni Al-Marhum Sultan Haji Omar 'Ali Saifuddien Sa'adul Khairi Waddien, Sultan and Yang Di-Pertuan of Brunei Darussalam, aptly demonstrated the importance India attaches to its bilateral engagement with Brunei.

“The visit will contribute to further bolstering of our strong bonds of friendship,” he said.

He also expressed, “We greatly appreciate the government of His Majesty for consenting to receive the INS Ships for Port Call, lending support and timely clearance for berthing of the two ships at Muara Port.

“We also greatly appreciate the effective and thoughtful measures taken by the Government of His Majesty and their timely implementation to contain the spread of the COVID-19 in Brunei,” he said, adding that the visit “will be contactless”.

The high commissioner said, “The crew will be on their own ships. There will be no human-to-human contact at all. Its all done through signals, messages, communication so its contactless.”

He said the commanding officers will have a virtual call to senior officers of RBN and other components of the programme which include virtual interaction, harbour drills, passage and communication exercises.

The high commissioner said the defence cooperation between Brunei Darussalam and India has been strengthening from year to year.

“We have just renewed the memorandum of understanding on defence collaboration for a period of five years, which was initially signed in 2016.



ABOVE: Indian High Commissioner to Brunei Darussalam Ajaneesh Kumar and one of the visiting Indian Navy ships in the background; and Indian Navy personnel aboard one of the visiting ships (Below).
PHOTOS: JAMES KON

“We are also in new areas of cooperation. In 2019, the Royal Brunei Armed Forces (RBAF) commander was in India and visited our training ground and institutions, including the jungle warfare school in the northern part of India.

“We are looking at training some Brunei defence personnel in that institution, so the relationship is very solid.”

<https://borneobulletin.com.bn/indian-navy-arrives-for-joint-exercises-2/>

COVID 19: DRDO's Contribution

दैनिक भास्कर

Tue, 10 Aug 2021

4 ऑक्सीजन प्लांट जल्द होंगे शुरू: 6 महीने बाद प्रतिदिन मिलेगी 26 लाख लीटर ऑक्सीजन, 15 दिनों में एमसीएच हॉस्पिटल में पहला प्लांट होगा चालू

धौलपुर: कोरोना की तीसरी लहर को देखते हुए धौलपुर अस्पताल प्रबंधन ने तैयारियां पूरी कर ली हैं। आगामी 6 माह में 26 लाख लीटर प्रतिदिन ऑक्सीजन का उत्पादन शुरू हो जाएगा। पीएमओ समरवीर सिंह ने बताया कि कोरोना की दूसरी लहर के दौरान धौलपुर अस्पताल में सिर्फ एक ही ऑक्सीजन उत्पादन सेंटर था। जिससे प्रतिदिन 35 सिलेंडर ऑक्सीजन गैस का उत्पादन होता था। कोरोना की दूसरी लहर के दौरान ऑक्सीजन की कमी को देखते हुए तीन नए ऑक्सीजन प्लांट शुरू किए जाने हैं।

एक प्लांट एमसीएच हॉस्पिटल में आगामी 15 दिनों में शुरू होगा। जिससे प्रतिदिन 100 सिलेंडर गैस का उत्पादन होगा। दूसरे ऑक्सीजन प्लांट के लिए मशीनरी धौलपुर पहुंच गई है। जिनका इंस्टॉलेशन आगामी 15 दिनों में कर दिया जाएगा। नई आईसीयू यूनिट में लगाया जा रहा तीसरा ऑक्सीजन प्लांट करीब 1 महीने में शुरू होगा। चौथा ऑक्सीजन प्लांट प्रधानमंत्री की चलाई गई डीआरडीओ योजना के तहत नवीन मेडिकल कॉलेज में लगाया जा रहा है। 200 सिलेंडर प्रतिदिन उत्पादित करने वाले इस प्लांट का सिविल काम शुरू हो चुका है। आगामी 6 माह में चौथा प्लांट भी शुरू हो जाएगा।



ऑक्सीजन उत्पादन केंद्र में नई मशीन को इंस्टॉल कराते पीएमओ समरवीर सिंह।

<https://www.bhaskar.com/local/rajasthan/bharatpur/dholpur/news/after-6-months-26-lakh-liters-of-oxygen-will-be-available-daily-in-15-days-the-first-plant-will-be-operational-in-mch-hospital-128796468.html>

उम्मीदों के निष्कर्ष

कोरोना उन्मूलन की लंबी है लड़ाई

कोरोना संक्रमण की विश्वव्यापी त्रासदी के बीच यह भारत की उपलब्धि ही कही जायेगी कि देश में पचास करोड़ से अधिक लोगों को पहला कोरोनारोधी टीका लग चुका है। यह आंकड़ा दुनिया के कई बड़े देशों की कुल आबादी से अधिक है। देश में स्वदेशी टीके का तैयार होना और कई विदेशी टीकों का उत्पादन कोरोना संक्रमण के खिलाफ हमारे अभियान को ताकत देता है।

देश बेहद घातक डेल्टा वेरिएंट की त्रासदी से धीरे-धीरे उबरने लगा है। दक्षिण भारत और पूर्वोत्तर में संक्रमण की दर में धीरे-धीरे कमी आ रही है। ऐसे वक्त में जब देश में कुल संक्रमण का आंकड़ा सवा तीन करोड़ को छूने को है, सरकारी आंकड़ों के हिसाब से सवा चार लाख लोगों को हम खो चुके हैं, देश में तीन करोड़ लोगों के कोरोना संकट से उबरने के बावजूद संक्रमण की चुनौती खत्म नहीं हुई है। तीसरी लहर की आशंका को लेकर चिकित्सा विज्ञानी चेता रहे हैं। ऐसे में भारतीय आयुर्विज्ञान अनुसंधान परिषद यानी आईसीएमआर के हालिया अध्ययन के निष्कर्ष उम्मीद जगाने वाले हैं।

आईसीएमआर के अध्ययन में दावा किया गया कि कोरोना संक्रमण रोकने के लिये कोविडरोधी टीका कोवैक्सीन और कोविशील्ड की एक-एक खुराक लेने से रोग के खिलाफ बेहतर रोग प्रतिरोधक क्षमता विकसित होती है। दुनिया में अपनी किस्म का यह विशेष अध्ययन उत्तर प्रदेश में करीब सौ लोगों पर किया गया। इसमें 18 लोग ऐसे थे जिन्होंने अनजाने में ही टीके की पहली खुराक कोविशील्ड और दूसरी खुराक कोवैक्सीन ले ली थी। लेकिन इन लोगों में बेहतर ढंग से रोग प्रतिरोधक क्षमता विकसित हुई।

आईसीएमआर का अध्ययन इस तरह अलग वैक्सीन की एक-एक खुराक लेने को सुरक्षित बताता है। उल्लेखनीय बात यह कि इस प्रयोग के प्रतिकूल प्रभाव वैसे ही थे, जैसा कि एक ही वैक्सीन की दो खुराक लेने के बाद सामने आते हैं। इसके बारे में कहा जा रहा है कि यह अपने किस्म का पहला अध्ययन है, जिसमें दो अलग-अलग टीकों के खुराक के असर की प्रामाणिक जानकारी दी गई है।

दरअसल, तीसरी लहर की आशंकाओं के बीच देश में संक्रमणरोधी टीकों का आंकड़ा ऐतिहासिक रूप से पचास करोड़ पार कर जाना देश का आत्मविश्वास बढ़ाने वाला है। ऐसे वक्त में जब यूरोप-अमेरिका में तीसरी-चौथी लहर दस्तक दे रही है तो हमारे लिये बेहद सतर्क रहने की जरूरत है। अभी भारत डेल्टा वेरिएंट की भयावह त्रासदी से उबरने की कोशिश में है। लेकिन संकट अभी टला नहीं है। महामारी की दूसरी लहर में चिकित्सा संसाधनों के अभाव में हमने जिस मानवीय त्रासदी के भयावह दृश्य देखे, उससे हमें सबक लेने की जरूरत है। चिकित्सा के मोर्चे पर तैयारी की तो जरूरत है ही, एक नागरिक के रूप में भी सतर्कता की जरूरत है। एक बड़ी आबादी मानकर चल रही है कि देश से कोरोना की अंतिम विदाई हो चुकी है। पिछले दिनों पर्यटन स्थलों पर उमड़ती बेपरवाह भीड़ और कोरोना से बचाव के उपायों की अनदेखी चिंता बढ़ाने वाली है। कमोबेश यही स्थिति कस्बों-गांवों से लेकर छोटे-बड़े शहरों की भी है। ये स्थिति कहीं न कहीं तीसरी लहर की चिंताओं को बढ़ाने वाली है।

पिछली लहर की त्रासदी से सबक लेकर आगे बढ़ने की जरूरत है। ऐसे में सरकार द्वारा अमेरिकी दवा कंपनी जॉनसन एंड जॉनसन के सिंगल शॉट वैक्सीन को आपातकालीन मंजूरी उम्मीद जगाने वाली है। इसी तरह अन्य अमेरिकी वैक्सीनों व रूसी वैक्सीन स्पूतनिक-वी के उपयोग व उत्पादन की आपातकालीन

अनुमति सकारात्मक कदम कहा जा सकता है जो कोरोना संक्रमण उन्मूलन के लिये हमारी लड़ाई को मजबूती देगा। ऐसे में डीआरडीओ को कोरोनारोधी दवा और अन्य वैकल्पिक दवाओं का उत्पादन व उपलब्धता हमारी प्राथमिकता होनी चाहिए। इस लड़ाई में हमारे चिकित्सा वैज्ञानिकों की भूमिका बढ़ जाती है। सरकार और नागरिकों के स्तर पर बेहतर तालमेल के साथ ही हम कोरोना संक्रमण के खिलाफ निर्णायक लड़ाई लड़ सकते हैं। तभी हम विश्वास से भारत को कोरोना मुक्त करने के संकल्प को हकीकत बना सकते हैं। लड़ाई लंबी जरूर है लेकिन आत्मनिर्भर भारत इस लड़ाई को जीतने में सक्षम हो सकता है।

<https://www.dainiktribuneonline.com/news/editorials/expected-conclusions-57821>



Tue, 10 Aug 2021

झांसी मेडिकल कॉलेज और बरुआसागर सीएचसी को मिला आक्सीजन प्लांट, विधायक और मेयर ने किया लोकार्पण

जयपुर: झांसी मेडिकल कॉलेज और बरुआसागर सीएचसी अस्पताल अब ऑक्सीजन के मामले में आत्म निर्भर बन चुका है। झांसी सदर विधायक रवि शर्मा और मेयर रामतीर्थ सिंघल ने मेडिकल कालेज ऑक्सीजन प्लांट और बरुआसागर सीएचसी प्लांट का बबीना विधायक राजीव सिंह परीक्षा ने लोकार्पण आज किया गया है। दोनों प्लांट को पीएम केयर फंड से तैयार किया गया है। सीडीओ शैलेश कुमार ने कहा मेडिकल कालेज प्लांट जिला अस्पताल, महिला अस्पताल और पीकू वार्ड में भी ऑक्सीजन सप्लाई होगी। महारानी लक्ष्मीबाई मेडिकल कॉलेज में पीएसए जो कि 1000 एलपीएम क्षमता का ऑक्सीजन प्लांट और बरुआसागर सीएचसी में 500 एलपीएम क्षमता का जोकि सीयूजीएल कानपुर के सीएसआर द्वारा लगाया गया, दोनों ही प्लांट का पूजा अर्चना के साथ लोकार्पण किया गया विधायक सदर ने लोकार्पण के अवसर पर अपने सम्बोधन में कहा कि कोविड-19 की संभावित तृतीय लहर के दौरान जनपद में ऑक्सीजन की कमी को पूरा करने हेतु मेडिकल कॉलेज में स्थापित व बरुआसागर में ऑक्सीजन प्लांट पीएम केयर फंड द्वारा प्रदत्त किया गया है। उन्होंने बताया कि अब दोनों ऑक्सीजन प्लांट के लग जाने से जनपद में ऑक्सीजन की कमी नहीं होगी। विधायक ने मुख्य चिकित्सा अधिकारी को निर्देश देते हुए कहा कि कोविड-19 को देखते हुए तीसरी लहर से बचने के लिये ज्यादा से ज्यादा टीकाकरण अभियान चलाया जाये। सीडीओ शैलेश कुमार ने कहा कि आज का दिन बड़े हर्ष का दिन है। जनपद के यह दोनों ऑक्सीजन प्लांट अब ऑक्सीजन की कमी पूरा करेंगे। उन्होंने बताया कि बरुआसागर अस्पताल में स्थापित प्लांट की क्षमता 500 लीटर प्रति मिनट है, स्थापित किया गया है। महारानी लक्ष्मी बाई मेडिकल कॉलेज में ऑक्सीजन प्लांट गैस पीएम केयर द्वारा स्वीकृत किया गया जिसे डीआरडीओ द्वारा बनाकर स्थापित किया गया है। इस प्लांट की क्षमता 1000 लीटर प्रति मिनट है। उन्होंने बताया कि इन प्लांट द्वारा जिला चिकित्सालय एवं जिला महिला चिकित्सालय में नवनिर्मित पीकू वार्ड में भी आपूर्ति की जायेगी।

<https://samacharnama.com/states/uttar-pradesh-news/jhansi-news-jhansi-medical-college-and-baruasagar-chc-got/cid4412226.htm>

Defence Strategic: National/International



Press Information Bureau
Government of India

Ministry of Defence

Mon, 09 Aug 2021 3:14PM

Increase in budget for Army

Details of BE allocation under Non-Salary (Revenue) Budget and Capital Acquisition Budget of Indian Army during the five year period of 2017-18 to 2021-22 and previous five year period of 2012-13 to 2016-17 is as under:-

(Rs. In crore)

Year	Non-Salary (Revenue)	Capital Acquisition	Total	% age increase over the previous year
2012-13 to 2016-17	1,30,852.23	91,576.35	2,22,428.58	-
2017-18 to 2021-22	1,62,801.25	1,21,222.56	2,84,023.81	27.69

The above figures indicate that there has been substantial increase of 27.69% in the five year period of 2017-18 to 2021-22 over 2012-13 to 2016-17. Further, the operational efficiency matches the technological advancement commensurately.

This information was given by Raksha Rajya Mantri Shri Ajay Bhatt in a written reply to Ms Saroj Pandey in Rajya Sabha today.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1744048>



Press Information Bureau
Government of India

Ministry of Defence

Mon, 09 Aug 2021 12:57PM

Indian Naval Ships *Shivalik* and *Kadmatt* at Brunei to enhance bilateral ties

In pursuance of India's 'Act East' Policy, Indian Naval Ships *Shivalik* and *Kadmatt* arrived at Muara, Brunei as part of their deployment to South East Asia on 09 Aug 21. During the stay at Muara, Brunei, the crew of both the ships will participate in various bilateral professional interactions with Royal Brunei Navy.

The exercise will provide an opportunity to both the navies to enhance inter-operability, gain from best practices and develop common understanding of procedures for Maritime Security Operations. The harbour interactions and exercises at sea aim to consolidate the



strong bond shared by the two navies and would be another step towards strengthening India-Brunei defence relations. The bilateral exercise would conclude with a Passage Exercise with Royal Brunei Navy at sea on 12 Aug 21.

In the backdrop of the COVID19 pandemic, all interactions and exercises will be conducted strictly as 'Non-Contact' activities and hence would be devoid of any physical contact between the personnel of participating navies.

Indian Navy Ships *Shivalik* and *Kadmatt* are the latest indigenously designed and built, multi-role Guided Missile Stealth Frigate and Anti-Submarine Corvette respectively, and form part of the Indian Navy's Eastern Fleet based at Visakhapatnam under the Eastern Naval Command. The two ships are equipped with a versatile array of weapons and sensors, can carry multi-role helicopters, and represent the maturation of India's warship-building capabilities.

On completion of bilateral exercise with Royal Brunei Navy, the ships will head to Guam to participate in exercise *MALABAR-21* with the Japanese Maritime Self Defence Force (JMSDF), Royal Australian Navy (RAN) and the United States Navy (USN).

<https://pib.gov.in/PressReleasePage.aspx?PRID=1743981>



Mon, 09 Aug 2021 12:57PM

भारतीय नौसेना के जहाज शिवालिक और कदमत द्विपक्षीय संबंधों को आगे बढ़ाने के लिए ब्रुनेई पहुंचे

भारत की 'एक्ट ईस्ट' नीति के अनुपालन में भारतीय नौसेना के जहाज शिवालिक और कदमत दक्षिण पूर्व एशिया में अपनी तैनाती के हिस्से के रूप में आज मुआरा, ब्रुनेई पहुंचे। मुआरा, ब्रुनेई में अपने प्रवास के दौरान दोनों जहाजों के चालक दल रॉयल ब्रुनेई नौसेना के साथ विभिन्न द्विपक्षीय पेशेवर बातचीत में हिस्सा लेंगे।



इस युद्धाभ्यास से दोनों देशों की नौसेनाओं को अंतर-संचालन में बढ़ोतरी करने, श्रेष्ठ प्रक्रियाओं से लाभ उठाने और समुद्री सुरक्षा परिचालन के लिए साझा समझ विकसित करने का अवसर उपलब्ध होगा। बंदरगाहों पर होने वाली बातचीत और समुद्रीय अभ्यास का उद्देश्य दोनों नौसेनाओं द्वारा साझा किए गए घनिष्ठ संबंधों को और मजबूत बनाना है। यह अभ्यास भारत-ब्रुनेई रक्षा संबंधों को अधिक मजबूत बनाने की दिशा में एक और कदम साबित होगा। यह द्विपक्षीय अभ्यास 12 अगस्त 2021 को समुद्र में रॉयल ब्रुनेई नौसेना के साथ एक 'पैसेज' अभ्यास के साथ समाप्त होगा।

कोविड-19 महामारी की पृष्ठभूमि में सभी बातचीत और अभ्यास 'नॉन-कांटेक्ट' गतिविधियों के रूप में ही आयोजित किए जाएंगे, इसलिए इस अभ्यास में भाग ले रही दोनों नौसेनाओं के कर्मियों के बीच निश्चित दूरी बनाए रखने का अनुपालन किया जायेगा।

भारतीय नौसेना के शिवालिक और कदमत स्वदेशी रूप से नवीनतम डिजाइन और निर्मित, बहु उद्देश्यीय गाइडेड मिसाइल स्टील्थ फ्रिगेट और एंटी-सबमरीन कार्वेट जहाज हैं, जो पूर्वी नौसेना कमान के तहत विशाखापत्तनम स्थित भारतीय नौसेना के पूर्वी बेड़े का हिस्सा हैं। दोनों जहाज हथियारों और संसरो की एक बहु-उपयोगी श्रृंखला से लैस हैं। ये बहु-भूमिका निभाने वाले हेलीकॉप्टरों को ले जा सकते हैं तथा भारत की युद्धपोत-निर्माण क्षमताओं की परिपक्वता को दर्शाते हैं।

रॉयल ब्रुनेई नौसेना के साथ द्विपक्षीय अभ्यास पूरा होने पर ये दोनों जहाज जापानी मेरीटाइम सेल्फथ डिफेंस फोर्स (जेएमएसडीएफ), रॉयल ऑस्ट्रेलियाई नौसेना (आरएएन) और यूनाइटेड स्टेट्स नौसेना (यूएसएन) के साथ मालाबार-21 अभ्यास में भाग लेने के लिए गुआम जाएंगे।

<https://pib.gov.in/PressReleasePage.aspx?PRID=1744013>



Press Information Bureau
Government of India

Ministry of Defence

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Indian Army contingent to participate in International Army Games – 2021 in Russia

A 101 member contingent of the Indian Army will proceed to Russia to participate in International Army Games - 2021 from 22 August to 04 September 2021. The contingent will participate in Army Scout Masters Competition (ASMC), Elbrus Ring, Polar Star, Sniper Frontier and Safe Route games showcasing various drills in High Altitude Area terrain, operations in snow, sniper actions, combat engineering skills in obstacle ridden terrain in the various competitions. The contingent will also contribute two observers (one each) for the Open Water and Falcon Hunting games in which Pontoon Bridge laying and UAV crew skills will be showcased by the participating teams.

The Indian Army contingent has been selected out of the best from various arms after three levels of screening. Participation in these annual games is a reflection of the level of professionalism of the Indian Army amongst the world Armies. The competition also fosters military to military cooperation while building upon the best practices of participating nations. Previously India stood first amongst the eight countries that had participated in Army Scouts Master Competition 2019 in Jaisalmer.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1743916>



पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Mon, 09 Aug 2021 9:56AM

रूस में आयोजित होने वाले अंतरराष्ट्रीय सैन्य खेल- 2021 में भारतीय सेना का दल भाग लेगा

भारतीय सेना का एक 101 सदस्यीय दल दिनांक 22 अगस्त से 4 सितंबर 2021 तक अंतरराष्ट्रीय सैन्य खेल-2021 में भाग लेने के लिए रूस रवाना होगा। यह दल विभिन्न प्रतियोगिताओं में उच्च पर्वतीय क्षेत्र, बर्फ के बीच सैन्य कार्रवाई, स्नाइपर कार्रवाई, बाधायुक्त मार्ग में कॉम्बैट इंजीनियरिंग कौशल आदि का प्रदर्शन करते हुए आर्मी स्काउट मास्टर्स प्रतियोगिता (एसएमसी), एल्ब्रस रिंग, पोलर स्टार, स्निपर फ्रंटियर और सेफ रूट गेम्स में हिस्सा लेगा। सेना का दल ओपन वाटर और फाल्कन हंटिंग गेम्स के लिए दो पर्यवेक्षकों (दोनों खेलों में एक-एक) का भी योगदान देगा, जिसमें भाग लेने वाली टीमों द्वारा पॉटून ब्रिज बिछाने और यूएवी चालक दल के कौशल का प्रदर्शन किया जाएगा।

स्क्रीनिंग के तीन स्तरों के बाद भारतीय सेना के दल को सेना के विभिन्न अंगों में से सर्वश्रेष्ठ में से चुना गया है। इन वार्षिक खेलों में भाग लेना विश्व की सेनाओं के बीच भारतीय सेना के पेशेवराना स्तर का प्रतिबिंब है। यह प्रतियोगिता भाग लेने वाले देशों की सर्वश्रेष्ठ प्रथाओं का उपयोग कर सेना के सेना से सहयोग भी बढ़ावा भी देती है। इससे पहले भारत उन आठ देशों में पहले स्थान पर था, जिन्होंने जैसलमेर में आर्मी स्काउट्स मास्टर्स प्रतियोगिता 2019 में भाग लिया था।

<https://pib.gov.in/PressReleasePage.aspx?PRID=1743979>

Offensive defence: Army to ready its first set of new battle groups by September end

The Integrated Battle Groups (IBGs) are agile, brigade-sized, and self-sufficient combat formations. In case of hostilities, they can swiftly strike against the enemies

By Mayank Singh

New Delhi: The Indian Army is giving the final touch to the Integrated Battle Groups (IBGs), the ambitious combat formation aimed at making the force more lethal and suitable to fight a modern war with the support of technology.

The IBGs are agile, brigade-sized, and self-sufficient combat formations. In case of hostilities, they can swiftly strike against the enemies. Every IBG will be tailor-made and will be based on the three Ts -- Threat, Terrain, and Task.



Indian Army (Photo | PTI)

A source said on Monday, "The officials led by the military operations met on Monday to finalise the formation of the Integrated Battle Groups with officials of other wings in presence."

All the officials concerned worked together as it affects almost all the Arms and the services of the Army and with them together decisions will be swift, the source added.

In the first go, of the two IBGs planned one is coming up under the 9 Corps mandated to operate on the Western Borders with Pakistan. The other one is being raised under the 17 Corps raised as the sole strike Corps to operate along the Northern borders with China. The aim is to firm up two IBGs by September end.

The IBGs will be self-contained fighting formations with the elements of every arm and service mixed together as per the terrain and operational requirements.

As reported earlier by *The New Indian Express*, each IBG will have a troop strength of around 5,000, bigger than a Brigade (3000-3,500) but smaller than a Division (10,000-12,000). These will have a mix of every arm and service like Infantry, Artillery, Armoured, Engineers, Signals, Air Defence, and others. In the initial phase, the Army has decided to reconstitute its standing forces into 12 modernised IBGs. The forces reassigned and reconstituted would be smaller but swifter with greater combat thrust.

As per the plan, there will be four IBGs under the nine Corps, five or six under 33 Corps, and three under the 17 Corps.

More formations will be approved once the first set is raised as the ambition is to do away with the Division Headquarters which function under the Corps and remove one complete layer from the organisational setup.

<https://www.newindianexpress.com/nation/2021/aug/09/offensive-defence-army-to-ready-its-first-set-of-new-battle-groups-by-september-end-2342411.html>

Indian Air Force deploys ‘Garud’ commandos near the contested border despite India, China truce

By Jayanta Kalita

The Indian Air Force (IAF) has deployed a special forces unit close to the Line of Actual Control (LAC) in eastern Ladakh amid a standoff with the Chinese People’s Liberation Army (PLA).

The IAF ‘Garud’ commandos were spotted in Noyoma Advanced Landing Ground (ALG) near LAC, multiple Indian news outlets reported.

According to news agency ANI, IAF has been operating the Apache attack helicopters and Chinook heavy-lift choppers in the area. The Garud special forces unit conducted exercises from Mi-17 helicopters.



IAF Garud commandos at a forward location near LAC. (via Twitter)

Interestingly, India and China last week decided to disengage at Gogra, one of the friction points at LCA, during the 12th round of corps commander-level talks. Earlier this year, both sides had pulled out their troops from Pangong Tso lake in eastern Ladakh.

Despite such “positive moves”, India and China continue to maintain a massive military presence in the disputed border area. While China has revamped its airfields in Xinjiang and Tibet regions for quick deployment of air assets, India is also likely to expand its capability to operate fixed-wing aircraft from facilities near the de facto border with China.

The strategically-located Nyoma ALG of IAF has been witnessing a lot of activity of late. It is the closest airbase to the LAC in eastern Ladakh.

According to India Today, the Nyoma ALG which hosts the world’s highest Air Traffic Control system has been hosting IAF’s Chinook CH-47F and Apache helicopters to support the armed personnel stationed at the LAC.

Besides, Mi-17V5 medium-lift helicopters and C-130J Super Hercules have been engaged in transportation and logistics operations.

Additionally, the Nyoma ALG is being utilized to monitor movement on the Chinese side of the border from an altitude of 14,000 feet.

“Nyoma ALG has strategic importance due to its close proximity to Line of Actual Control. It bridges the critical gap between Leh airfield and the LAC enabling quick movement of men and material in eastern Ladakh, overcoming terrain friction,” IAF’s Group Captain Ajay Rathi told ANI.

The Garud Unit

According to the latest reports, Garud commandos of the IAF took part in an exercise at Nyoma ALG recently.

The commando unit was formed in the wake of the 2001 terror attacks at two IAF bases in Jammu and Kashmir. It functions like Indian Army commandos and the Indian Navy’s MARCOS (Marine Commandos), but “with much greater multi-tasking capabilities than the other two”, wrote Air Marshal VK Bhatia (retired).

“The group, originally christened ‘Tiger Force’, was later renamed ‘Garud Force’. About a year later, in 2003, the Government of India authorized a 1,080 strong force to be raised and trained on

the lines of para-commandos of the army and MARCOS of the navy but, with the additional mandate of performing niche air force specific operational tasks,” according to Bhatia.

They are trained in jungle warfare, anti-terror operations and other forms of warfare. Apart from protecting airfields and air assets, Garuds “operate more on the lines of the army’s para-commandos and the navy’s MARCOS to undertake missions anywhere, including behind enemy lines”.

“Armed with Negev Light Machine Guns, Tavor-21 & AK-47 assault rifles, Garud Special Forces operatives have been deployed in forward locations along the Line of Actual Control in Eastern Ladakh,” Bharatiya Janata Party lawmaker from Tsering Namgyal tweeted on August 9.

Last year, India had deployed one of its secretive military units called Special Frontier Force (SSF) in eastern Ladakh where Indian and Chinese troops have been locked in a standoff for more than a year now.

The 3,500-strong guerrilla force reportedly comprises exiled Tibetan youth who had fled to India along with the Dalai Lama.

Meanwhile, IAF’s Rafale and Sukhoi fighter jets are slated to participate in air patrolling in the region.

“The fighters have been operating regularly in this area earlier as well. The development of infrastructure for fixed-wing operations from ALG is planned in the near future,” Group Capt. Rathi told ANI.

Notably, the Chinook has been designed to elude radar technology and is capable of conducting missions in the Himalayas with a flying range of about 550 km and for three hours at a stretch. Even, the Apache helicopter is deemed to be the most suitable for mountain warfare.

China’s Special Forces

China boasts its commando forces whose prowess was demonstrated during the Ingenious Special Operations Soldier-2018 exercise. Its naval commandos were involved in evacuations in Yemen in 2015 and in returning a freighter seized by Somali pirates in the Gulf of Aden in 2017.

However, it is not clear if PLA has deployed its special forces near LAC. According to the National Interest, the PLA Army commando unit can operate in different terrains, from desert to frozen mountains, and is known for conducting airborne, surface, and underwater infiltration missions.

In addition, the PLA Air Force had set up a special unit called ‘Leishen’ (‘Thunder Gods’) as part of the Airborne corps based in Hubei in 2011.

The Leishen unit is tasked with “reaching all regions, taking advantage of all opportunities, overcoming all difficulties, and defeating all opponents”, according to defense analyst Peter Wood.

Members of Leishen have attended Venezuela’s “Hunter School” to learn jungle warfare and participated in several international special forces competitions, Wood wrote.

<https://eurasianimes.com/indian-air-force-deploys-garud-commandos-near-the-contested-border-despite-india-china-truce-watch/>

Editorial: Indian Navy's Atmanirbhar moment

The Navy must now be given freedom and budgetary support to build another warship

The successful sea trial of the first indigenous aircraft carrier marks a historic moment in the history of the Indian Navy and reflects a stellar achievement of defence engineering. With this feat, India now joins the elite club of six nations — the US, UK, Spain, Russia, France, and China — that have the capability to design and build an indigenous aircraft carrier. Built at a cost of Rs 23,000 crore, the 40,000-tonne warship is a reincarnation of the earlier version of INS Vikrant, which had played a significant role in the liberation of Bangladesh in 1971.

The Indian Navy has been focusing on significantly bolstering its overall capabilities in view of China's growing efforts to increase its military presence in the Indian Ocean Region. The Indian Ocean, considered the backyard of the Indian Navy, is critical to the country's strategic interests. The project has also demonstrated the strength of the public-private partnership as nearly 550 firms, including about 100 small and medium enterprises, were involved in it, providing various services overcoming the pandemic-induced difficulties. Vikrant will be the second aircraft carrier after the Russian-built INS Vikramaditya, which was commissioned in 2013. The next challenge is to expedite the completion of works on India's second indigenous aircraft carrier INS Vishal. The Navy must be given total freedom, flexibility and the necessary budgetary support to build another warship. Given the rapidly changing security scenario, India needs to carry out military modernisation at a much faster pace. The current weapons procurement system too needs overhauling and must be decoupled from the red tape.

The Navy has been seeking approval from the government since 2015 to build a second indigenous aircraft carrier (IAC-2). This proposed carrier, INS Vishal, is intended to be a giant 65,000-tonne vessel, much bigger than IAC-1 and the INS Vikramaditya. The Navy has been trying to convince the government of the operational necessity of having a third carrier because persistent air power is required day and night to defend the vast Indian Ocean Region. Now that India has developed the capability to build such vessels, it should not be whittled away. The expertise gained by the Navy over the past 60 years in the art of maritime aviation should not be allowed to be wasted. Even if the government gives the IAC-2 project the go-ahead now, it will be over 10 years before the warship is commissioned. An aircraft carrier is one of the most potent marine assets for a nation, which enhances the Navy's capability to carry out air domination operations. While the United States Navy has 11 aircraft carriers, China has two and a third one is in the making and another two are likely to be commissioned within a decade.

<https://telanganatoday.com/editorial-indian-navys-atmanirbhar-moment>

India, Israel hold ‘fruitful discussion’ to deepen defence, industrial ties: Defence Minister

By Harinder Mishra

Tel Aviv: India and Israel on Monday held a “fruitful discussion” to deepen their defence and industrial ties, reviewing the ongoing cooperation, Israeli Defence Minister Benny Gantz said.

Gantz took to Twitter to announce that he met India’s Ambassador to Israel Sanjeev Singla and held bilateral talks, two weeks after he held an “excellent call” with his Indian counterpart Rajnath Singh, the first since the new government was formed in Israel under Prime Minister Naftali Bennett.

“This morning I met with Indian Ambassador to Israel, His Excellency Singla for a fruitful discussion about deepening Israel-India defence and industrial ties,” the Israeli defence minister said in a tweet.

“This meeting comes on the heels of an excellent call that I had with my Indian counterpart (Rajnath Singh) just two weeks ago,” Gantz said.

A senior adviser to the Israeli defence minister told PTI that the two ministers have spoken to each other on defence collaborations also in the past but it was the first since the new government was formed in Israel in June.

Bennett was sworn in as Israel's new prime minister on June 13, ending Netanyahu's 12-year hold on power and the political uncertainty that gripped the Jewish nation for months after inconclusive elections.

“We reviewed global and regional challenges, as well as the numerous tactical threats that Israel faces on all fronts.

“We also discussed various areas of collaboration in defence R&D (research and development), mil-to-mil (military to military) cooperation, & exchanges in information and expertise,” Gantz said on Twitter.

The Indian envoy has held discussions with senior leaders in the new Israeli government recently, discussing ways of strengthening bilateral cooperation in various fields.

Air Force chief RKS Bhadauria was on a three-day visit to Israel last week to discuss the enhancement of bilateral exchanges between the two strategic partners.

(Disclaimer: This story has not been edited by Outlook staff and is auto-generated from news agency feeds. Source: PTI)

<https://www.outlookindia.com/newscroll/india-israel-hold-fruitful-discussion-to-deepen-defence-industrial-ties-defence-minister/2138120>

Indian Navy destroyer arrives in Saudi Arabia for maiden Naval exercise

By Dipanjan Roy Chaudhury

Synopsis

The visit by the ship heralds a new chapter in the bilateral defence ties with the commencement of the harbour phase of first Naval Exercise between the two countries – ‘AL-MOHED AL-HINDI 2021’, according to a statement issued by the Indian Embassy in Riyadh.

Bearing testimony to the growing defence ties between India and Saudi Arabia, INS KOCHI, the flagship destroyer of Indian Western Naval Fleet, arrived at Port Al-Jubail on Monday.

The visit by the ship heralds a new chapter in the bilateral defence ties with the commencement of the harbour phase of first Naval Exercise between the two countries – ‘AL-MOHED AL-HINDI 2021’, according to a statement issued by the Indian Embassy in Riyadh.

‘AL-MOHED AL-HINDI 2021’ which commenced on Monday comprises a number of shore and sea-based exercises between the two friendly Navies. On its arrival at the Jubail port, the ship was given a warm welcome by officials of the Royal Saudi Naval Forces, Border Guards and Indian Embassy. The ship during its stay at the port will be following all laid down COVID Protocols, according to the Statement.

INS KOCHI, an indigenously designed and built Kolkata class stealth guided missile destroyer, by Mazagaon Dock Limited, Mumbai was commissioned on 30 September 2015 and is one of the most potent warships in its class. The ship incorporates new design concepts for stealth and has many firsts to her credit, including a large component of indigenous combat suites.

The Ship can be truly classified as a ‘Network of Networks’ as it is equipped with sophisticated digital networks, besides a sophisticated array of state of art weapons and sensors to neutralise any threat from the air, sea and underwater. The unique feature of the ship is the high level of indigenisation achieved with most of the systems onboard sourced from within the country. Some of the other major indigenised systems onboard INS KOCHI include the Electronic Warfare Suite, Foldable Hangar Doors, Helo Traversing System and the Ship’s Stabilisers. The ship in the past has taken part in joint exercises with various friendly foreign Navies.

<https://economictimes.indiatimes.com/news/defence/indian-navy-destroyer-arrives-in-saudi-arabia-for-maiden-naval-exercise/articleshow/85185985.cms>



Tue, 10 Aug 2021

Exercise Cutlass 2021: Prospects of alignment of Indo-U.S. interests in the Western Indian Ocean

By Abhishek Mishra

The 2021 edition of the Cutlass Express, which is a U.S. Africa Command-(USAFRICOM) directed annual multinational maritime exercise conducted by U.S. Naval Forces Africa to promote national and regional maritime security in East Africa and the Western Indian Ocean (WIO). This year, it commenced on 26 July in the vicinity of Djibouti, Kenya, Madagascar, and the Seychelles. The drills, which would go on till 6 August 2021, are designed to assess and improve regional cooperation in support of the Djibouti Code of Conduct (DCoC), create maritime domain awareness (MDA), and facilitate information sharing between maritime operations centres.

This year's edition involves the participation of 12 East African countries, the UK, India, and various international organisations such as the International Maritime Organisation (IMO), United Nations Office on Drugs and Crime (UNODC), European Union Naval Force Somalia (EUNAVFOR), Critical Maritime Routes Indian Ocean (CRIMARIO), EUCAP Somalia, and Interpol. The Indian Navy's guided missile frigate INS Talwar is participating in the exercise, where it is undertaking the training of contingents from participating countries in various fields across the spectrum of maritime security operations.

Most of the African countries participating in this exercise do not have sufficient naval capabilities or coastal security force to effectively patrol their waters and counter illicit maritime activity. Therefore, the training of naval personnel and the valuable operational experience gained under such multilateral exercise, like the Cutlass Express, is vital for improving interoperability and developing shared operating procedures between the participating navies. The broader aim is to improve African states' ability to suppress and counter illegal activities, including piracy, arms and drugs trafficking, human smuggling, and illegal trade in wildlife.

“The training of naval personnel and the valuable operational experience gained under such multilateral exercise, like the Cutlass Express, is vital for improving interoperability and developing shared operating procedures between the participating navies.”

India's participation in the Cutlass Exercise is taking place right on the heels of the External Affairs Minister Dr. S Jaishankar's recent visit to Kenya and U.S. Secretary of State Antony Blinken's visit to New Delhi. Secretary Blinken's visit to India revealed both convergences and divergences in the Indo-U.S. partnership. While the India and U.S. relations have grown in recent years, mostly due to bilateral and multilateral cooperation on Indo-Pacific and the Quadrilateral Security Dialogue (Quad), some challenges have also come to the forefront. India is concerned about the possibility of Afghanistan turning into a safe haven for extremists, post American withdrawal from the war-torn nation. Concerns over getting access to raw materials for the production of COVID-19 vaccines, and democracy and human rights are some of the other issues. Despite these challenges, New Delhi and Washington are keen to expand their cooperation in issues ranging from infrastructure development, climate change, and maritime security.

Indian concerns and standing on the Indo-Pacific

Although the Indian Navy is increasingly being recognised as a 'preferred security partner' in the Indian Ocean Region (IOR), it is important to realise that no power, including India, can unilaterally match up with Chinese military capabilities and economic heft. This provides rationale for 'similar thinking' countries like India and the U.S., which share similar values, ideals, and democratic tradition, to work together in order to ensure a transparent and rules-based maritime order in the Indo-Pacific. Concerns over a rising China, and its growing belligerence in the Indo-

Pacific has been a key factor which has led to strengthening of Indo-U.S. defence and security ties in recent years.

On its part, the Biden administration has certainly been keen to institutionalise the Indo-Pacific and formalise the Quad, in order to balance China. However, as emphasised by PM Modi in his address at Shangri La Dialogue in 2018, India does not consider the Indo-Pacific region as a club or grouping of limited members that seeks to dominate and is directed against any specific country. As some observers have argued, India in its Indo-Pacific strategy, has so far adopted a conciliatory approach rather than a confrontationist one.

India's emphasis has mostly been on finding mutual avenues of cooperation and evolving a normative framework of tackling not only deterrence or hard security aspects, but also non-traditional security challenges like environmental security, IUU fishing, HADR, arms, drugs and human smuggling, blue economy, tourism, etc. These issues have a direct bearing on the economic well-being and sustainable development of East African and Indian Ocean island nations. Therefore, it is incumbent on India, U.S., or other external powers to factor in these considerations while developing their strategies for maritime security engagement with African countries.

The African perspective

For some time now, external powers have been scrambling to set up naval and military bases in Africa. In this process, these countries are attempting to align with friendly regimes for protecting their investments and safeguarding the commercial sea lanes from piracy. As a result, African leaders have continuously voiced their apprehensions about getting caught in between great power contestation. Without clearly defining their national interests, power capabilities, and taking direct policy positions on the Indo-Pacific, African countries risk getting marginalised from the very process and activities that will impact the continent's long-term prosperity and interests. As such, it is increasingly becoming difficult for African states to remain passive bystanders and adopt a position of neutrality.

“China remains a pivotal actor in the geo-economic realm and preferred partner of many African countries for the funding of critical infrastructure.”

Though perceptions from country to country may vary, Africans generally welcome Chinese commercial engagement in the continent. China remains a pivotal actor in the geo-economic realm and preferred partner of many African countries for the funding of critical infrastructure. Chinese enterprises have invested billions of dollars towards African infrastructure development projects, especially since the inception of Chinese Belt and Road Initiative (BRI). A case in point was the recent construction of Lamu port in Northern Kenya. China has also recently resumed talks with new Tanzanian President Samia Suluhu Hassan's administration to revive the US \$10 billion Bagamoyo port project. Although such projects might be perceived as threatening to Indian and U.S. interests, they, in fact, are required for regional growth and development in Africa.

Can India and U.S. work together in African waters?

It is no secret that U.S. has for long operated in African waters. At a time when the Indian Navy is increasing its own presence in a regular and sustained manner in the WIO region, there are ample opportunities for India and U.S. to cooperate in the maritime security domain. The signing of the Logistics Exchange Memorandum of Agreement (LEMOA) with U.S. in August 2016 has been beneficial for Indian warships operating in Gulf of Aden and Indian Ocean. The agreement has helped facilitate Indian warships to take fuel from U.S. Navy oil tankers deployed in the region. The U.S. must also take into account the priorities emerging from the Indian Ocean Rim Association (IORA) platform. The U.S. has been an active dialogue partner of IORA since 2012 and can better utilise the platform as a forum for initiating new initiatives with its Indo Pacific partners.

Going forward, it will be in the American interest to shed its restrictive understanding of the contours of the Indo-Pacific, and instead adopt an inclusive, whole-of-government approach that does not neglect the role of the Western Indian Ocean within the Indo-Pacific strategy. The WIO is a strategically important sub-region of what India considers to fall within the ambit of the Indo-

Pacific region, but does not feature in the U.S. conception of the same. Righting this divergence in strategic mapping will send a signal to allies of both the countries and present opportunities for greater collaboration between the U.S. and other active players in the IOR like India, France, and Japan.

“The U.S. has been an active dialogue partner of IORA since 2012 and can better utilise the platform as a forum for initiating new initiatives with its Indo Pacific partners.”

The real challenge will be to identify ways in which India and U.S. can incorporate African maritime priorities and concerns within their Indo-Pacific engagement. Concerns over climate change, sovereignty, delimitation of maritime boundaries, protection of SLOCs, illegal fishing, trade and infrastructure development, marine governance, and port cyber infrastructure security, are some of African littorals priorities that will require dedicated attention from Indian and U.S. stakeholders.

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

<https://www.orfonline.org/expert-speak/exercise-cutlass-2021/>

Science & Technology News



Tue, 10 Aug 2021

Explained: India in real-time and hi-res. How ISRO'S GIsat-1 will be a 'game-changer'

India is set to send its first real-time imaging satellite into space on August 12. Here's all you need to know

Indian space scientists are set to add another feather to their caps with the launch of the country's first state-of-the-art agile Earth Observation Satellite (EOS) on August 12. Perched in an orbit high above the Earth, this “eye in the sky” will allow real-time monitoring of the entire subcontinent, helping with everything from agriculture to defence.

What Is GIsat-1?

Developed by the Indian Space Research Organisation (ISRO), GIsat is an imaging satellite that will be launched via the indigenously made Geosynchronous Satellite Launch Vehicle-F10 (GSLV-F10) from the Satish Dhawan Space Centre at Sriharikota in Andhra Pradesh. The tentative take-off is at 5.43 am on August 12, 2021, weather permitting.

The satellite weighs more than 2 tonnes and ISRO will for the first time be using an Ogive-shaped fairing — basically, a classic

TAKE-OFF
12 August,
5:43 AM

LAUNCH SITE
Sriharikota

LAUNCHER
GSLV-F10

WEIGHT
2,268-kg

HOW GISAT-1 WILL BE A GAME-CHANGER

India is set to launch its most advanced geo-imaging satellite (GIsat-1)

HOW WILL IT HELP

High-res cameras to provide near real time observation of the Indian subcontinent, under cloud free

The satellite will be placed in a geosynchronous transfer orbit. It will move to its geostationary orbit at a height of about **36,000 km** using its onboard

bullet-shaped pointed curved surface casing — with the view to accommodating a larger payload.

The satellite will be placed by GSLV-F10 in a geosynchronous transfer orbit following which it will climb to its geostationary orbit at a height of about 36,000 km above the Earth's surface using its onboard propulsion system.

What Are The Advantages Of A Geostationary Satellite?

Geostationary implies that the satellite will be located above the Equator and always appear to be fixed at one point in the sky. But such satellites aren't motionless. All that happens is that the high orbit they are placed in "makes the satellite travel at the same rate as the Earth's spin". With its movement thus synchronised with the rotation of the Earth, Gisat-1 will be circling the Earth once every 24 hours.

How such satellites help on-ground receiving stations is that they can be pointed to a fixed location in the sky and don't have to constantly readjust — which would be the case with low-Earth satellites, which need to be tracked across the sky.

ISRO says that India now "has one of the largest constellations of remote sensing satellites" for Earth observation with data from these satellites used for "several applications covering agriculture, water resources, urban planning, rural development, mineral prospecting, environment, forestry, ocean resources and disaster management".

How Will Gisat-1 Help?

Reports say that the advanced imaging satellite has been described as a "game changer" for India with its high resolution cameras allowing constant, real-time monitoring of the Indian landmass and the oceans. Among the key areas where it can prove its utility is defence, enabling "special attention to the country's borders for security reasons".

Further, when it comes to natural disasters, monitoring by the satellite can ensure that precautions are taken well in advance to reduce their impact. Apart from disaster warning, ISRO said the satellite will also provide "spectral signatures for agriculture, forestry, mineralogy, cloud properties, snow and glaciers and oceanography" and will be carrying multispectral and hyperspectral cameras in different bands "with improved spatial and temporal resolution".

However, the satellite needs cloud-free conditions to capture images. Union minister Jitendra Singh has told Rajya Sabha that the satellite can accomplish imaging of the whole country 4-5 times daily.

Why Was Its Launch Delayed?

From technical glitches to the Covid-19 pandemic, the Gisat-1 launch has had to suffer multiple delays and will be only the second launch by ISRO so far in 2021 following the February launch of 18 small satellites.

It was originally slated for launched on March 5, 2020, but that was cancelled due to technical reasons. Right after followed the pandemic and the lockdowns it brought along with it, which meant the the Gisat-1 launch suffered a lengthy delay. Rescheduled for March 28 this year, "a minor issue" first led the launch to be put off till April and, then, as the second wave broke, to May.

<https://www.news18.com/news/explainers/explained-india-in-real-time-and-hi-res-how-isros-gisat-1-will-be-a-game-changer-4062119.html>

Physicists have built a mathematical 'playground' to study quantum information

In a new study from Skoltech and the University of Kentucky, researchers have found a new connection between quantum information and quantum field theory. This work attests to the growing role of quantum information theory across various areas of physics. The paper was published in the journal *Physical Review Letters*.

Quantum information plays an increasingly important role as an organizing principle connecting various branches of physics. In particular, the theory of quantum error correction, which describes how to protect and recover information in quantum computers and other complex interacting systems, has become one of the building blocks of the modern understanding of quantum gravity.



Credit: Pixabay/CC0 Public Domain

"Normally, information stored in physical systems is localized. Say, a computer file occupies a particular small area of the hard drive. By "error" we mean any unforeseen or undesired interaction which scrambles information over an extended area. In our example, pieces of the computer file would be scattered over different areas of the hard drive. Error correcting codes are mathematical protocols that allow collecting these pieces together to recover the original information. They are in heavy use in data storage and communication systems. Quantum error correcting codes play a similar role in cases when the quantum nature of the physical system is important," Anatoly Dymarsky, Associate Professor at the Skoltech Center for Energy Science and Technology (CEST), explains.

In a rather unexpected twist, scientists realized not too long ago that quantum gravity—the theory describing quantum dynamics of space and time—operates similar mathematical protocols to exchange information between different parts of space. "The locality of information within quantum gravity remains one of the few open fundamental problems in theoretical physics. That is why the appearance of well-studied mathematical structures such as quantum error correcting codes is intriguing," Dymarsky notes. Yet the role of codes was only understood schematically, and the explicit mechanism behind the locality of information remains elusive.

In their new paper, he and his colleague, Alfred Shapere from the University of Kentucky Department of Physics and Astronomy, establish a novel connection between quantum error correcting codes and two-dimensional conformal field theories. The latter describe interactions of quantum particles and have become standard theoretical tools to describe many different phenomena, from fundamental elementary particles to quasi-particles emerging in quantum materials, such as graphene. Some of these conformal field theories also describe quantum gravity via holographic correspondence.

"Now we have a new playground to study the role of quantum error correcting codes in the context of quantum field theory. We hope this is a first step in understanding how locality of information actually works, and what hides behind all this beautiful mathematics," Dymarsky concludes.

More information: Anatoly Dymarsky et al, Solutions of Modular Bootstrap Constraints from Quantum Codes, *Physical Review Letters* (2021). DOI: [10.1103/PhysRevLett.126.161602](https://doi.org/10.1103/PhysRevLett.126.161602)

Journal information: [Physical Review Letters](https://phys.org/news/2021-08-physicists-built-mathematical-playground-quantum.html)

<https://phys.org/news/2021-08-physicists-built-mathematical-playground-quantum.html>

Qubit in a crystal lattice of boron nitride is a suitable sensor

By Robert Emmerich

An artificially created spin defect (qubit) in a crystal lattice of boron nitride is suitable as a sensor enabling the measurement of different changes in its local environment. The qubit is a boron vacancy located in a two-dimensional layer of hexagonal boron nitride and has an angular momentum (spin).

The defect is very sensitive to its atomic environment, for example to the distances to other atoms or atomic layers.

"This allows local measurements of magnetic fields, temperature and even pressure," says Professor Vladimir Dyakonov, head of the Chair of Experimental Physics VI at Julius-Maximilians-Universität (JMU) Würzburg in Bavaria, Germany. Measurements are performed completely optically using a laser—therefore, the sensor does not require any electrical contact.

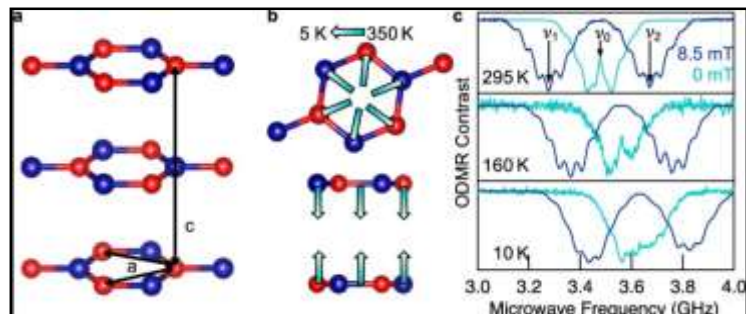


Fig. 1: Schematic of the hexagonal boron nitride (hBN). a Alternating boron (red) and nitrogen (blue) atoms and the lattice constants a and c. b Lattice contraction and expansion due to temperature variation, according to crystallographic data²⁴. c cw ODMR spectra measured with (dark blue) and without (cyan) external magnetic field at different temperatures $T = 295, 160,$ and 10 K. Lowering of the temperature causes the resonances v_0, v_1, v_2 to shift to larger microwave frequencies indicating an increase of the zero-field splitting D_0, D_1, D_2 . Credit: DOI: 10.1038/s41467-021-24725-1

"Modulating microwaves of different frequencies on and off, the spin defect can be manipulated to derive different external influences such as temperature, pressure and magnetic field," explains Andreas Gottscholl. The physics doctoral student at JMU is first author of the publication in the journal *Nature Communications*, which presents the new sensor.

Characteristics of the novel sensor

Atomic sensors based on spin defects already exist: they are made of diamond or silicon carbide and are suitable for local measurements of temperature and magnetic field. "Our boron nitride sensor provides an additional response to external pressure changes and exceeds the sensitivity of previous systems, especially at low temperatures," explains Gottscholl.

"Another new feature of our spin defect is its location in a two-dimensional crystal lattice. Compared to the established three-dimensional systems based on diamond or silicon carbide, it provides completely new application possibilities," adds the Würzburg physicist.

Example: Boron nitride is currently considered as the standard material for encapsulating of novel 2D devices such as nanometre-sized transistors. "With our work, we have demonstrated that we can artificially embed atomic sensors in the widely used material boron nitride. This should allow to directly measure influences such as temperature, pressure and magnetic field on the investigated devices."

Next research steps

So far, the researchers have demonstrated the functionality of the sensor on a large ensemble of several million spin defects. Next, they want to show sensing with single spin defects. If this succeeds, an application on the nanometre scale would be feasible.

"Particularly interesting is the idea of using boron nitride of only one atomic layer, thus the sensor is positioned directly on the surface of the investigated system," says Professor Dyakonov. This would allow direct interaction with the immediate environment.

Field of application of the sensor

Applications in materials research, device development or biology could be interesting in order to gain new insights in these fields. In addition to other possible scientific implementations, it is also conceivable in the long term to use the spin defect as a commercial sensor— this could revolutionize medical imaging techniques, as the sensor could map local temperatures as an image contrasts, for example.

More information: Andreas Gottscholl et al, Spin defects in hBN as promising temperature, pressure and magnetic field quantum sensors, *Nature Communications* (2021). [DOI: 10.1038/s41467-021-24725-1](https://doi.org/10.1038/s41467-021-24725-1)

Journal information: [Nature Communications](https://phys.org/news/2021-08-qubit-crystal-lattice-boron-nitride.html)
<https://phys.org/news/2021-08-qubit-crystal-lattice-boron-nitride.html>



Tue, 10 Aug 2021

Researchers design three-dimensional kirigami building blocks to make dynamic metamaterials

By Matt Shipman

A new approach to producing metamaterials draws on kirigami techniques to make three-dimensional, reconfigurable building blocks that can be used to create complex, dynamic structures. Because the design approach is modular, these structures are easy to both assemble and disassemble.

"Applying kirigami to three-dimensional materials offers a new level of reconfigurability for these structures," says Jie Yin, corresponding author of a paper on the work and an associate professor of mechanical and aerospace engineering at North Carolina State University.

Researchers are optimistic that these 3D metamaterials could be used in applications such as lightweight construction materials for buildings, components for modular robotics and wave guiding in acoustic metamaterials.



Credit: North Carolina State University

Kirigami is a variation of origami that involves cutting paper, in addition to folding it. While kirigami is done using two-dimensional materials, such as paper, Yin and his collaborators have applied the principles of kirigami to three-dimensional materials that are cut into connected cubes.

Specifically, the researchers modeled their new approach using a series of eight connected cardboard cubes that are open on two sides. Think of each unit of eight connected cubes as a building block. Depending on how the cubes are connected to each other, these building blocks can be folded into more than 300,000 different designs.

"Think of these kirigami units as versatile building blocks that can be assembled to create larger structures with different mechanical properties," Yin says. "What's more, the larger structures can also be disassembled, allowing users to reassemble the kirigami units into new structures."

To demonstrate the utility of the concept, the researchers created more than a dozen reconfigurable building blocks. Each block consisted of eight connected paper cubes and could be reconfigured into eight different shapes. Video highlights the ways that each unit could be reconfigured into different structures, how those structures could be assembled into larger structures, and how the assembled large structures could be disassembled back into the reconfigurable blocks. (The video can be viewed at the top of the page.)

Depending on the orientation of the solid cube walls and open sides in each block, and the placement of each block in the larger structure, the structure will behave differently. This allows users to tune each building block's mechanical properties. For example, a single building block could be folded into a structure that can be easily compressed, or refolded into a different shape that is capable of bearing a significant load.

"The fact that you can disassemble and reconfigure these 3D metamaterials allow users to alter the mechanical properties of a structure as needed to perform different tasks," Yin says. "Fold it one way to make it easy to compress, fold it another way to allow for lateral movement, fold it a third way to make it rigid or enhance its physical strength—and so on.

"This work was focused on demonstrating the fundamental concept," Yin says. "Our next step is to demonstrate applications for the concept."

The paper, "3D Transformable Modular Kirigami-Based Programmable Metamaterials," is published in the journal *Advanced Functional Materials*.

More information: Yanbin Li et al, 3D Transformable Modular Kirigami Based Programmable Metamaterials, *Advanced Functional Materials* (2021). DOI: [10.1002/adfm.202105641](https://doi.org/10.1002/adfm.202105641)

Journal information: [Advanced Functional Materials](https://phys.org/news/2021-08-three-dimensional-kirigami-blocks-dynamic-metamaterials.html)
<https://phys.org/news/2021-08-three-dimensional-kirigami-blocks-dynamic-metamaterials.html>

COVID-19 Research News



Tue, 10 Aug 2021

Modified tapeworm drug may help treat Covid-19: Study

According to a study conducted by a team at the Scripps Research Institute in the US, a modified drug prescribed to treat tapeworms may be effective against Covid-19.

Los Angeles: A modified drug prescribed to treat tapeworms may be effective against Covid-19, according to a study conducted in lab.

The team at the Scripps Research Institute in the US said it was known for 10 to 15 years that the class of drugs called salicylanilides work against certain viruses, but they tend to be gut-restricted and can have toxicity issues.

According to the study published in the journal *ACS Infectious Disease*, the modified salicylanilide compound overcomes both issues, in mouse and cell-based tests.

The compounds act as both an antiviral and an anti-inflammatory drugs, with properties that auger well for its use in pill form, the researchers said.

Salicylanilides were first discovered in Germany in the 1950s and used to address worm infections in cattle, they said.

Versions including the drug niclosamide are used in animals and humans today to treat tapeworms.

The modified salicylanilide compound was developed by Professor Kim Janda, a professor at Scripps Research, years ago for another project.

When the SARS-CoV-2 virus became a global pandemic in early 2020, knowing that they may have antiviral properties, he started screening his old collection first in cells.

Later, he worked with Scripps Research immunologist John Teijaro, to conduct tests in rodents.

One compound dubbed "No. 11," stood out. This compound differs from the commercial tapeworm medicines in key ways, including its ability to pass beyond the gut and be absorbed into the bloodstream -- and without the worrisome toxicity.

"Niclosamide is basically digestive-track restricted, and that makes sense, because that's where parasites reside," Janda said.

"For that reason, simple drug repurposing for a Covid treatment would be counterintuitive, as you want something that is readily bioavailable, yet does not possess the systemic toxicity that niclosamide has," he explained.

About 80 per cent of salicylanilide 11 passed into the bloodstream, compared to about 10 per cent of the antiparasitic drug niclosamide, which has recently entered clinical trials as a Covid-19 treatment, Janda said.

The experiments showed that of the many modified salicylanilides Janda had built in his laboratory, No. 11 affected pandemic coronavirus infections in two ways.

First, it interfered with how the virus deposited its genetic material into infected cells, a process called endocytosis.

Endocytosis requires the virus to form a lipid-based packet around viral genes.

The packet enters the infected cell and dissolves, so the infected cell's protein-building machinery can read it and churn out new viral copies.

No. 11 appears to prevent the packet's dissolution, according to the researchers.

"The compound's antiviral mechanism is the key," Janda says.

"It blocks the viral material from getting out of the endosome, and it just gets degraded. This process does not allow new viral particles to be made as readily," he said.

Importantly, because it acts inside cells rather than on viral spikes, which the virus uses to enter the human cells, questions about whether it would work in new variants like Delta and Lambda are not a concern, Janda added.

"This mechanism is not dependent on the virus spike protein, so these new variants coming up aren't going to relegate us to finding new molecules as is the case with vaccines or antibodies," he said.

No. 11 also helped quiet potentially toxic inflammation in the research animals, Janda said, which could be important for treating acute respiratory distress associated with life-threatening Covid infections.

It reduced levels of interleukin 6, a signalling protein which is a key contributor of inflammation typically found in advanced stages of Covid-19, the researchers added.

<https://www.indiatoday.in/coronavirus-outbreak/story/modified-tapeworm-drug-may-help-treat-covid-19-study-1838895-2021-08-10>

