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Exclusive: $375 million BrahMos deal: Entire defence establishment of Philippines likely to be present

The BrahMos missiles are likely to be a deterrent to Chinese aggression as the PLA navy has been in what the Phillippines say is its waters.

By Srinjoy Chowdhury

New Delhi: For the $375 million BrahMos deal likely to be signed tomorrow in Quezon City, the entire defence establishment of the Philippines is likely to be present, despite the Covid problem.

(Representational Image)

India will be transferring two launchers and a full complement of missiles for the Philippine Navy tomorrow. These will be shore-based anti-ship missiles. The function will be at the Department of National Defence, Camp General Emilio Aguinaldo, Quezon City at 2 pm.

Among those present are

- Delfin Lorenzana, the secretary of national defence. He is the equivalent of the defence minister of India.
- Cardozo Luna, undersecretary of national defence
- Another undersecretary in charge of acquisition and research management, an assistant secretary in charge of logistics and the chief of the Defence Procurement Service and other officials will be present.

For the Philippine armed forces, the top brass will be present. They will include

- General Andres Centino, chief of staff of the country's armed forces. He is the equivalent of the chief of defence staff.
- Vice Admiral Adeluis Bordado, the flag officer in command. He is the overall commander of the Philippine Navy.
- Major General Ariel Reyes Caculitan, commandant of the Marine Corps and other officers.

From the Indian side, the Ambassador, Shambhu Kumaran, will be present. Members of the Brahmos team to be virtually present are Atul Dinkar Rane, the managing director of Brahmos Aerospace, Dr Sanjeev Joshi, the deputy CEO and other top officials including Colonel JP Uniyal, GD Moorjani, Praveen Pathak, Colonel R. Negi and Colonel A. Mishra.

The BrahMos missiles are likely to be a deterrent to Chinese aggression as the PLA navy has been in what the Phillippines say is its waters. International arbitration has favoured the Filipinos, but the Chinese have refused to accept the judgement.

https://www.timesnownews.com/india/article/375-million-brahmos-deal-entire-defence-establishment-of-philippines-likely-to-be-present/853626

THE | DIPLOMAT
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Fri, 28 Jan 2022

Can the Philippines' BrahMos Missiles really deter China?

Technological limitations on Manila's end will limit the missile's range – and its deterrent factor

By Ben Ho

After much chatter going back to 2019, it is finally a done deal: Earlier this month, the Philippines announced that it had inked an agreement worth $375 million to procure the Indo-Russian BrahMos anti-ship missile and its supporting assets. The mainstream argument is that the supersonic weapon will improve Manila's anemic defense capabilities, especially as the Armed Forces of the Philippines (AFP) increasingly faces up to the Chinese military juggernaut. Making an observation along this line, one commentator noted that the BrahMos would provide a "stiff deterrent" to Beijing's assertiveness in the South China Sea. Similarly, another observer argues that having the BrahMos "will significantly supplement the defense capabilities of the Philippines by enabling it to strike seaborne or surface targets at a considerable distance from its shores."

That said, deterrence is, as the eminent U.S. diplomat Henry Kissinger once put it, a product of capability and resolve, as well as the opponent's belief in one's capability and the resolve to use it. Military weapons are an integral element of the first factor. But as long as just one of these three elements is zero, the output will be zero, as one learns from elementary math. Indeed, from an operational point of view, the Philippines' BrahMos purchase would likely register a low figure in the capability portion of the deterrence equation as long as Manila lacks the requisite sensors to maximize the weapon system's range. As a consequence, the Philippines' much-ballyhooed deterrence of China using the BrahMos is likely to be limited.

The range of this missile, according to its manufacturers, is a tidy 290 kilometers, and this has made Philippine navy admiral-turned-academic Rommel Jude Ong join the chorus of mainstream discourse on the issue and contend that the weapon will provide "a defensive buffer across a certain extent of the EEZ (or exclusive economic zone that extends to about 370 km off the coastline)." According to Naval Tactics 101, however, one can shoot only as far and as well as your sensors are able to cue you to, especially with regard to moving targets like warships that need to be pinpointed and constantly tracked. A missile system's sales-brochure range of hundreds of klicks is for nought when your sensors can only detect and track targets at distances much less than of that.

This is exactly the issue that Manila will face, as the BrahMos launcher's own radar can only provide coverage merely dozens of kilometers out because of the Earth's curvature. The AFP lacks over-the-horizon radar that could mitigate the problem, but this lacuna is understandable given that such a capability is accessible usually to larger military powers.

The limitations imposed by the Earth's curvature could also be mitigated by airborne sensors that provide the militarily important element of "high ground." However, the Philippine military is severely lacking in the aerial intelligence, surveillance, and reconnaissance (AISR) domain. Crucially, the air force does not have any dedicated airborne warning and control system aircraft like the E-3 Sentry. The Phillippines' AISR platforms, according to the latest edition of the authoritative Military Balance, include barely a dozen Cessna utility aircraft and OV-10 Bronco light attack and observation planes, which are hardly suited for the demanding tasks of maritime ISR.

While Manila possesses a number of Heron and Blue Horizon surveillance drones, they are simply too small in number – five according to the Military Balance 2021 – to make a difference (and they belong to the air force rather than BrahMos' future operators, the army, the marines, or the latter's parent organization, the navy). Moreover, these platforms are slow flying – like most of their kind are – and this makes them essentially hapless in the face of the enemy, especially one with substantial anti-air capabilities such as China.

And even if Manila were to have credible AISR platforms on paper, integrating them with other systems like the BrahMos is another issue together, bearing in mind that the AFP is also lacking in the command and control, communications, and computers department that would be so crucial in enabling network-centric warfare. Indeed, the fact that the Philippine navy entered the missile age only as recently as 2018 is but one symptom of the AFP's overall backwardness.

All in all, contrary to popular opinion, the BrahMos in Manila's hands cannot hold potential adversarial warships at risk from long range, even if this particular missile has a near-300-kilometer range on paper according to its developers. At best, the Philippine BrahMos' engagement envelope is in the vicinity of dozens of kilometers bearing in mind the aforementioned limitations. Retired Philippine general Edilberto Adan is therefore right on point when he stresses the "need for eyes and ears" for a missile system like the BrahMos, adding that the latter "has to be integrated with a surveillance and intelligence capability for the simple reason that what you cannot see or what you cannot detect, you cannot engage."

As the BrahMos deal earlier this month came to light, perhaps somewhere in China, an informed key member of the People's Liberation Army Navy was smiling as he nonchalantly crossed the Philippine BrahMos off his list of threats.

However, Mischief Reef, with its Chinese installations, is less than 220 kilometers away from the Philippine shoreline, and it could be accurately targeted as it is a land target whose location is fixed, obviating the need for sensors that are able to detect and track mobile targets beyond the horizon. That, perhaps, is the saving grace of the much-vaulted weapon systems coming into Manila's hands. The BrahMos would finally enable the AFP to credibly threaten a small but significant element of the Chinese politico-military colossus, without putting Philippine forces in harm's way.

https://thediplomat.com/2022/01/can-the-philippines-brahmos-missiles-really-deter-china/

Press Information Bureau
Government of India

Ministry of Defence

Thu, 27 Jan 2022 6:29PM

Defence Secretary holds interaction with Defence Industry

Defence Secretary Dr Ajay Kumar held an interactive session on promoting Defence Exports with the stakeholders of the Defence Industry on 27 January 2022. More than 500 Defence industries from across public and private sectors, including Industry Associations and Defence Attaches from Indian Missions abroad participated in the session. The main focus of the session was to understand the challenges faced by Defence Industries and to encapsulate their suggestions

for further policy reforms and actions required to enhance the Defence exports. During the interaction, Defence Industries highlighted their concerns and shared their suggestions for policy interventions in order to enhance Defence exports.

Shri Sanjay Jaju, Additional Secretary, Department of Defence Production reinforced the commitment of the Government to facilitate Defence exports and ensured that all their recommendations will be addressed timely in an appropriate manner.

The Defence Secretary appreciated the suggestions given by the industries and directed the Department of Defence Production to examine suggestions and come out with suitable policy reforms and actionable points which may help in improving Defence Exports.

The event was organized by the Department of Defence Promotion in collaboration with Society of Indian Defence Manufacturers (SIDM).

https://pib.gov.in/PressReleasePage.aspx?PRID=1793004

THE TIMES OF INDIA

Fri, 28 Jan 2022

Army Chief Gen Naravane asks personnel to study statecraft from ancient Indian texts

By Ch Sushil Rao

Hyderabad: The Indian Army will draw lessons from statecraft as seen in ancient Indian texts to make itself stronger. Chief of Army Staff General M M Naravane said the focus should be on this as the 'the ancient texts have universal applicability.'

Gen Naravane was speaking at a national webinar organised by the College of Defence Management in Secunderabad, a premier tri-services training institution of the Armed Forces on Thursday. The theme of the national webinar is 'Indian Ancient Knowledge System: Relevance to national security and defence management.'

"Study the vast repository of Indian ancient knowledge with greater rigour and draw lessons of contemporary relevance from them," the army chief said.

The webinar will discuss the concepts of culture, civilization and nation as enumerated in ancient Indian texts and also bring out 'various aspects as constituents of national power'.

Strategic culture, principles of statecraft, use of force and Indian approaches to foreign policy making will be discussed during the two-day event. Veterans, and serving armed forces officers including those of friendly foreign countries will be part of the discussions.

The national seminar is an annual event conducted at the College of Defence Management and focusses on contemporary issues of strategy and management. "Our ancient texts have universal applicability and drawing the right lessons would help us not only in strengthening our cultural values, but also in building a credible national security architecture."

https://timesofindia.indiatimes.com/india/army-chief-gen-naravane-asks-personnel-to-study-statecraft-from-ancient-indian-texts/articleshow/89162458.cms

Press Information Bureau
Government of India

Ministry of Defence

Thu, 27 Jan 2022 2:16PM

‘Leveraging Artificial Intelligence (AI) for Indian Navy’ Workshop at INS Valsura

Indian Navy’s premier technical training institute INS Valsura organised a workshop on the contemporary topic 'Leveraging Artificial Intelligence (Al) for Indian Navy' from 19 to 21 Jan 2022. Conducted under the aegis of Southern Naval Command, speakers from renowned IT Companies like Google, IBM, Infosys and TCS shared the industry perspective during the three-day event. Distinguished academicians from IIT Delhi, New York University, Amrita University and DA- IICT also spoke about the latest trends and applications of Al. The keynote address was delivered by Vice Admiral MA Hampiholi, Flag Officer Commanding in Chief, Southern Naval Command who stressed on the strategic importance of this niche technology and its application in the Indian Navy. The webinar conducted saw online participation by over 500 participants from across the country.

Indian Navy is focused on incorporation of Artificial Intelligence (AI) and Machine Learning (ML) in critical mission areas. Located at Jamnagar, INS Valsura has already been designated as the Centre of Excellence (CoE) in the field of Big Data and a state of art lab on AI and Big Data Analysis (BDA) was set up in Jan 2020. The Navy is currently in the process of creating a Centre of Excellence (CoE) in the field of AI at INS Valsura, which has been instrumental in progress of pilot projects pertaining to adoption of AI and BDA in the domain of maintenance, HR and perception assessment, in collaboration with academia and industry. In addition, the Navy is deeply involved in unifying and reorganising its enterprise data, as data is the fuel for all AI engines.

Organisationally, the Navy has formed an AI core group which meets twice a year for assessing all AI/ ML initiatives. AI initiatives being steered by the Navy are envisaged to have both tactical and strategic level impact. Periodic reviews of AI projects are being held so as to ensure adherence to the promulgated timelines. The Navy also conducts training in AI/ ML across all levels of specialty for its officers and sailors. This training is held both within Navy’s own training schools as also renowned IITs. Several personnel have undergone big and small AI linked courses over the last three years.

These initiatives of the Indian Navy are in sync with the country’s vision of making “India the global leader in AI, ensuring responsible and transformational AI for All”.

https://pib.gov.in/PressReleasePage.aspx?PRID=1792935

पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Thu, 27 Jan 2022 2:16PM

'भारतीय नौसेना के लिए कृत्रिम बुद्धिमत्ता (एआई) के लाभ प्राप्त करना' आईएनएस वलसुरा में एक कार्यशाला का आयोजन किया गया

भारतीय नौसेना के प्रमुख तकनीकी प्रशिक्षण संस्थान आईएनएस वलसुरा ने 19 से 21 जनवरी, 2022 तक समकालीन विषय 'भारतीय नौसेना के लिए आर्टिफिशियल इंटेलिजेंस (कृत्रिम बुद्धिमत्ता- एआई) के लाभ प्राप्त करना' पर एक कार्यशाला का आयोजन किया। इस कार्यशाला का आयोजन दक्षिणी नौसेना कमान के तहत किया गया था। इस तीन दिवसीय आयोजन के दौरान गूगल, आईबीएम, इन्फोसिस और टीसीएस जैसी प्रसिद्ध आईटी कंपनियों के वक्ताओं ने उद्योग जगत के विचारों को साझा किया। वहीं, आईआईटी दिल्ली, न्यूयॉर्क विश्वविद्यालय, अमृता विश्वविद्यालय और डीए-आईआईसीटी (धीरूभाई अंबानी इंस्टीट्यूट ऑफ इन्फॉर्मेशन एंड कम्युनिकेशन टेक्नोलॉजी) के प्रख्यात शिक्षाविदों ने भी एआई के नवीनतम रुझानों और उपयोगों के बारे में बताया।

इस कार्यशाला में दक्षिणी नौसेना कमान के फ्लैग ऑफिसर कमांडिंग इन चीफ वाइस एडमिरल एमए हम्पीहोली ने अपने प्रमुख संबोधन में एआई तकनीक के सामरिक महत्व और भारतीय नौसेना में इसके उपयोग पर जोर दिया। **इस वेबीनार में पूरे देश के 500 से अधिक प्रतिभागियों ने ऑनलाइन माध्यम से हिस्सा लिया।**

भारतीय नौसेना महत्वपूर्ण मिशन क्षेत्रों में आर्टिफिशियल इंटेलिजेंस (एआई) और मशीन लर्निंग (एमएल) को शामिल करने पर ध्यान केंद्रित कर रही है। जामनगर स्थित आईएनएस वलसुरा को पहले ही बिग डेटा के क्षेत्र में उत्कृष्टता केंद्र (सीओई) के रूप में नामित किया जा चुका है। इसके अलावा यहां जनवरी, 2020 में एआई और बिग डेटा एनालिसिस (बीडीए) पर एक अत्याधुनिक प्रयोगशाला स्थापित की गई है। वर्तमान में नौसेना आईएनएस वलसुरा में एआई के क्षेत्र में एक उत्कृष्टता केंद्र (सीओई) का निर्माण करने की प्रक्रिया में है, जो अकादमिक और उद्योग की सहभागिता में रखरखाव, मानव संसाधन व धारणा मूल्यांकन के क्षेत्र में एआई और बीडीए को अपनाने से संबंधित प्रायोगिक परियोजनाओं की प्रगति में सहायक रहा है। इसके अलावा नौसेना अपने उद्यम डेटा को एकीकृत व पुनर्गठित करने में गंभीरतापूर्वक लगा हुआ है, क्योंकि डेटा सभी एआई इंजनों के लिए ईंधन है।

संगठनात्मक तौर पर नौसेना ने एआई कोर ग्रुप का गठन किया है, जो सभी एआई/एमएल पहलों का आकलन करने के लिए हर साल दो बार बैठक करता है। नौसेना की संचालित एआई पहलों की परिकल्पना सामरिक और रणनीतिक, दोनों स्तरों पर प्रभाव डालने के लिए की गई है। एआई परियोजनाओं की आवधिक समीक्षा की जा रही है, जिससे तय की गई समय-सीमा का पालन सुनिश्चित किया जा सके। वहीं, नौसेना अपने अधिकारियों और नाविकों के लिए विशेषता के सभी स्तरों पर एआई/एमएल में प्रशिक्षण भी आयोजित करती है। यह प्रशिक्षण नौसेना के अपने प्रशिक्षण केंद्रों के साथ-साथ प्रसिद्ध आईआईटी में भी आयोजित किया जाता है। पिछले तीन वर्षों में कई कर्मियों ने बड़े और छोटे एआई संबद्ध पाठ्यक्रमों को किया है।

भारतीय नौसेना की ये पहल "सभी के लिए जिम्मेदार और परिवर्तनकारी एआई सुनिश्चित करते हुए भारत को एआई में वैश्विक नेता बनाने के देश की सोच" के अनुरूप है।

https://pib.gov.in/PressReleasePage.aspx?PRID=1792973

NDTV

Fri, 28 Jan 2022

3 Indigenously-built floating out-post vessels inducted in border force

The three indigenously build FBOP vessels will act as the strategic base stations for BSF at India's border with Pakistan and Bangladesh.

New Delhi: As the country on Wednesday was engaged in celebrating 73rd Republic Day, India's Border Security Force (BSF) inducted a fleet of three new Floating Border Out-Post (FBOP) vessels aimed at protecting the country's maritime borders.

"On Republic Day Parade 2022, Cochin Shipyard Limited (CSL) delivered the 2nd lot of 03 Floating Border Out-Post (FBOP) vessels out of 09 FBOPs for BSF to enable protect our maritime borders, adding a boost to border guarding," the BSF said.

Cochin Shipyard Limited (CSL) delivered the three FBOP vessels to the BSF.

A senior BSF officer told news agency ANI that FBOP vessels play a crucial role while protecting maritime borders as they help in demarking borders on waters.

The officer said that these vessels will act as a floating base for the flotilla of fast patrol boats and will supply petrol, drinking water, provisions to the smaller boats and will be deployed on India's eastern and western borders.

The three indigenously-built FBOP vessels will act as the strategic base stations at India's border with Pakistan and Bangladesh.

These vessels are important for the nation with regards to its safety and will also help in boosting the business through the country's coastal and inland waterways.

Cochin Shipyard Limited (CSL) delivered the three FBOP vessels to the BSF, which will provide land and riverine security along 3,323 km of India-Pakistan and 4,096 km of India-Bangladesh international borders. A batch of three similar vessels was delivered to the BSF earlier last year and the next batch of three vessels will be delivered soon.

With the induction of the second batch of FBOP vessels, the total number of such vessels in the BSF fleet has now reached 12.

The three FBOP's, with a length of 46 meters, are part of a series of nine vessels being built for the Water Wing of the Border Security Force. These vessels are designed in-house by CSL and classed by the Indian Register of Shipping. Each FBOP is designed with storage arrangements for four fast patrol boats, which can be launched and hoisted using its davit system.

https://www.ndtv.com/india-news/3-indigenously-built-floating-border-out-post-vessels-inducted-in-border-security-force-bsf-2732155

Fri, 28 Jan 2022

Assault weapons for the Indian Army and BrahMos Export: India must build on gains

India would have to make the best use of the India-Russia joint venture by producing, improving, and inducting the new weapons into the Indian Armed Forces.

By Kartik Bommakanti

As part of its light arms modernisation effort, India has acquired a suite of assault weapons for the Indian Army's (IA) infantry units. Amongst the biggest gains, if any, is that India's assault rifles manufacturing base received a boost, following the Russian President Vladimir Putin's visit to India last December. Both India and Russia signed an agreement for a Joint Venture (JV) as part of a newly established India-Russia Rifles Pvt. Ltd, which is comparable to the BrahMos Aerospace Ltd— another India-Russia cruise missile JV—to manufacture 600,000 AK-203 assault rifles for a price of 5,000 crores. The initial 70,000 rifles will be manufactured and exported from Russia. The remainder of the rifles are expected to be manufactured at a plant in Amethi, Uttar Pradesh, India. There is also the possibility of Transfer of Technology (ToT) with Russia consenting to a waiver for royalty. The AK-203 is a fifth-generation assault weapon of the renowned Kalashnikov series. All this represents something of a gain for India's small arms manufacturing sector.

Both India and Russia signed an agreement for a Joint Venture (JV) as part of a newly established India-Russia Rifles Pvt. Ltd, which is comparable to the BrahMos Aerospace Ltd— another India-Russia cruise missile JV—to manufacture 600,000 AK-203 assault rifles for a price of 5,000 crores.

But these weapons import, like many of India's problems with defence Research and Development (R&D) and manufacturing, will continue to persist, underlining the importance of getting India's own armed services to first deploy and use the weapons systems and platforms that India makes, thereby, rendering them more export-worthy. This is the fundamental test. Unfortunately, both the IA and the paramilitary forces do not use the Indian Small Arms System (INSAS) rifle anymore, because the assault rifle does not perform effectively and will be replaced by the AK-203. New Delhi will have to build on the technology it is expected to get from the AK-203 JV. Just as India has done with the BrahMos Supersonic Cruise Missile—a JV between India and Russia—the AK-203 must be exported from India. The BrahMos cruise missile has now received an export order from the Philippines, but this was possible because the missile is in part developed and fielded extensively across the Indian Armed Forces. Indeed, the latest test by the Defence Research and Development Organisation (DRDO) of a longer-range naval variant of the BrahMos demonstrates and confirms the extent to which the missile has evolved and improved, making it more exportable. The case in point is the Philippines' decision to purchase three batteries of the ground-launched BrahMos cruise missile, which crystallised largely due to its performance, where it managed to pass a stringent evaluation process, beating rival missile systems from Ukraine and Israel. There is the possibility of follow-on orders of the missiles by Manila.

There are commentators who aver that India needs a defence export promotion entity that links the Ministry of External Affairs (MEA) with the Ministry of Defence (MoD) or based within the MoD, which New Delhi lacks presently. After all, several efforts by BrahMos Aerospace to sell the supersonic cruise missile to Malaysia, Brazil, Indonesia, South Africa, and Chile had failed due to the absence, at least in part, of an export promotion agency comparable to the United States (US)

State Department's Bureau of Political and Military Affairs. Although it must be noted, this agency is the primary connection between the State Department and the US Department of Defense. The recommendation to create a defence product promotion entity is a helpful and reasonable proposal.

The latest test by the Defence Research and Development Organisation (DRDO) of a longer-range naval variant of the BrahMos demonstrates and confirms the extent to which the missile has evolved and improved, making it more exportable.

Regardless of whether an export promotion agency is established within the Ministry of Defence (MoD) or one that connects the MoD and the MEA, efforts in that direction will sunder if its success does not hinge equally on the Indian Armed Forces fielding the very capabilities India seeks to export. As is the case with the BrahMos, which has 70 percent native content, the AK-203 export success will depend on producing and critically improving on this variant of the Kalashnikov, and inducting the gun into the Indian Armed Services, especially the army. After all, the Russians are transferring technology to India, it is imperative that Indians make it exportable. However, there is a range of indigenously-built military hardware or hardware with significant indigenous content, where India is found wanting when it comes to both use by the Indian armed services and making the hardware exportable. For instance, take the case of the IA's resistance to acquiring Mk1 and Mk-1A variants of the Arjun Main Battle Tank (MBT) reflecting the level of scepticism or downright opposition a section of the army has, especially for indigenous weapons platforms such as battle tanks. Although the IA has inducted 124 tanks, it has opposed inducting more of them, mainly because of their weight and not due to their performance in desert terrain. The Mk-1A, the latest variant of the Arjun—118 of which the Army has ordered—is 6 tonnes heavier than the earlier variant. Any potential external buyer of these tanks will see for signs of internal resistance and the quantitative and operational strength of the tanks in the IA's order of battle.

Take the case of the IA's resistance to acquiring Mk1 and Mk-1A variants of the Arjun Main Battle Tank (MBT) reflecting the level of scepticism or downright opposition a section of the army has, especially for indigenous weapons platforms such as battle tanks.

To be sure, the Hindustan Aeronautics Limited (HAL) is on course to selling the indigenously-built Advanced Light Helicopters (ALH) to Mauritius, but this is only a drop in the ocean as far revenue from defence exports is concerned. HAL still has its task cut out in delivering Tejas Mark 1A fighters for the Indian Air Force (IAF), but the Modi government delayed clearing their procurement for over 45,000 crores until January 2021, even if HAL was poised to start supplying them as early as 2015. Thus, while the IA will gain from its import of the AK-203 assault weapons, India's R&D agencies need to make it better as they would be required to do for other domestically developed and manufactured military equipment. The Government of India (GoI) must remain focused and enthusiastic about strengthening India's native defence industry. Indeed, there has to be some unity of effort and purpose between the GoI, armed forces, R&D agencies, and manufacturers.

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

https://www.orfonline.org/expert-speak/assault-weapons-for-the-indian-army-and-brahmos-export/

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Fri, 28 Jan 2022

Unmanned Aircraft System and Indian Industries

By A. Karunakaran

The Government of India is promoting "Make in India" for self-reliance in the defence sector, which is evident in the several initiatives it has taken that favour potential Indian vendors in terms of indigenisation and technology development. The intention is to encourage Indian firms to design, develop and manufacture defence equipment at the system, subsystem and component levels, with indigenisation and self-reliance as primary focal areas.

In the early 1960s, DRDO and several Defence Public Sector Undertakings (DPSUs) like Hindustan Aeronautics Limited (HAL), Mazagon Dock Shipbuilders Limited (MDL), Garden Reach Shipbuilders & Engineers Limited (GRSE), Goa Shipyard Limited (GSL), Hindustan Shipyard Limited (HSL), Bharat Dynamics Limited (BDL), BEML Ltd, Mishra Dhatu Nigam (MIDHANI) and Bharat Electronics Limited (BEL) including Ordnance Factory Board (OFB) initiated defence production and over a period of time provided tremendous support to our Armed Forces. However, there has always been a gap between the demand and supply of equipment to the defence forces and therefore, till date the tri-services resort to importing critical equipment to meet their operational requirements. Noticeably, policies like 'Make in India' and 'Aatmanirbhar Bharat' are aimed at minimising imports by creating a robust ecosystem for nurturing private industries and optimisation of DPSUs and Ordnance Board. At the same time, foreign companies are encouraged to set up design, development and manufacture of military equipment in India so as to boost Indian economy and for creating job opportunities in India.

Defence Procurement Manual, Defence Acquisition Procedure 2020 and Defence Production and Export Promotion Policy 2020 encourage innovation and indigenisation in private industries, and are aimed at creating a dynamic, robust and competitive industry base so as to reduce dependence on imports and for promoting exports. The financial assistance to academia for research and development and the recent declaration of celebrating 16 January[1] as the 'Start-Ups Day' henceforth, shows the government's seriousness towards rewarding innovation and indigenisation in start-ups. Further, Strategic Partnership Model has been proposed for Indian industries to collaborate with foreign OEMs (Original Equipment Manufacturers) and to seek Transfer of Technology to build the capability to develop and manufacture equipment in India. Additionally, there are other initiatives like setting up Defence Corridors across states, conduct of defence exhibitions, seminars by autonomous bodies like Confederation of Indian Industry, Federation of Indian Chambers of Commerce and Industry, etc., and tri-services interactive forums with industries. Programmes like Innovation Defence Excellence (iDEX), Technology Development Fund (TDF), Defence India Start-Up Challenges (DISC) and In-services Innovation Contests with financial back-ups also look promising.

Despite the fact that the defence sector offers an ocean of opportunities for industries and favourable policies are being framed by the Government of India, ongoing global technological advancements in the areas like Artificial Intelligence, Machine Learning, Big Data analysis and mining, solar energy, advanced battery developments, Nano Technology, robotics, formulation of next-generation aviation traffic management systems, etc., could pose aviation challenges in the future.

Considering the government's push for indigenisation in a period of technological disruptions in the defence arena, a need has been felt for conducting research in one of the key specialty defence areas, namely Unmanned Aircraft Systems (UAS). The aim of the research is to understand the impact of government initiatives on Indian industries concerning UAS under these dynamic conditions. Further, the research also aims to understand India's Strategic Military balance in UAS sector compared to its potential neighbours China and Pakistan thereby seeing future roadmap of UAS in India.

Unmanned Aerial Machines are commonly denoted as Unmanned Aircraft/Aerial System (UAS), Unmanned Aerial Vehicle (UAV), Unmanned Combat Aerial Vehicle (UCAV), Remotely Piloted Aircraft (RPA), Remotely Piloted Vehicles (RPV), Loitering Munitions (LM) and Drones. The term UAS has been widely used since the system comprises UAV, Ground systems, Mission Control Stations and other supporting equipment. Irrespective of whether it is for civil or military use, the term UAV or Drones (a component of UAS and being airborne platform) is used by many authors as generic to represent UAS.

Analysts point out that India is at least a decade behind Pakistan and even further behind China in the UAV sector.[2] The "iron brothers" Pakistan and China have been closely collaborating in the development of and acquisition of various military platforms and weapons, including combat drones.[3] China had relied on UAVs and built a robust aviation programme right from the 1950s. Government support, reliable infrastructure, quality education, research and development have collectively helped China in this domain. Collaboration and joint ventures with other countries and clandestine operations also aided China in its objectives. Pakistan on the other side owes the development of its programme to the PSUs and support extended by China. The private sector also has a significant role to play. PSUs and more private industries focus on medium and small UAVs due to economic affordability, export value and low cost.

Considering the steady growth in the UAV sector across our neighbours, the government's roadmap for robust aviation corridor and industries' perspective on defence initiatives, a survey was carried out for Qualitative Analysis keeping into consideration the policies, industry capabilities and threat perception by our neighbours. The survey brought out insights that there is a possibility of immense growth for both civil and military UAVs/drones in future. The industries are inclined towards developing medium, small and mini UAVs including Swarm Drones.[4] Economic feasibility, demand across commercial sectors, mass production, qualified manpower in-house with technology help from overseas suppliers, and increased global competitiveness could all be factors for venturing into the small UAVs sector.

Large UAVs, on the other hand, are not given priority for a variety of reasons, including high investment costs, customised specific purpose needs, research and development, the likelihood of a minimum order number, advanced technology, and the lack of a guarantee for fixed orders. Even industry believes that the policies are beneficial to a considerable extent, but that they need to be revised in a few areas. DRDO and DPSUs' dependency for testing and lab facilities was also inferred. The industry has apprehension about involving academia and this is an important area to ponder upon.[5]

While India is establishing a strong aviation ecosystem by bringing together all stakeholders, including the government, promotional bodies, DPSUs, tri-services, academia and industry partners, experts believe that in the next 10 to 15 years, private Indian industries will be the crusaders for the government in defence production, particularly in the UAV vertical. Correlation between industries and the economy will also be crucial in the future. The concerns and suggestions shared by the industries must be taken into account and researched in order to provide value to the expanding ecosystem. The insights derived from the research would bring out the industries' perspective and may add value to government policies.

Views expressed are of the author and do not necessarily reflect the views of the IDSA or of the Government of India.

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Hindustan Times

Fri, 28 Jan 2022

China supplies mounted howitzers to Pak to maintain arms parity with India

Over the past decades, Pakistan has been able to punch far beyond its weight category with China doing the heavy lifting against India, be it in arms supply or in multilateral arms control regimes.

By Shishir Gupta

New Delhi: In a move that ensures that Pakistan continues to remain locked up in confrontation with India, Islamabad has received first batch of Chinese manufactured vehicle mounted howitzers to counter the Indian K-9 Vajra howitzers. Beijing is also supplying NORINCO AR-1 300 mm multi barrel rocket launchers to Rawalpindi so that the Pakistan Army has a reply to Indian rocket launchers. The total contract worth is around USD 512 million.

The supply of conventional weapon systems, fighter aircraft, destroyers and even the inclination to give DF-17 hypersonic missile to counter India's latest acquisition, the S-400 air defence system, are all part of Beijing long strategy to keep Rawalpindi GHQ in a state of permanent confrontation with India. This strategy has paid dividends to Beijing regime in the past as forces India to remain alert on its western border with a power that boxes much above its weight category due to heavy lift from China, be it in international fora or in military or nuclear parity. The role played by Beijing in developing Pakistan into a nuclear state along with the covert supply of delivery systems since 1990s is all well documented.

According to reports, Pakistan in 2019 signed a contract with Chinese arms major NORINCO to supply 236 SH-15 155 mm vehicle mounted howitzers apart from AR-1 heavy rocket launchers. In addition to artillery, the contract also includes supply and technology transfer for various ammunition including extended range artillery shells and guided artillery shells with the range of 53 kilometers. Clearly, this supply is to boost the firepower of Pakistan army all along the western border, specially to heat up the Line of Control in Jammu and Kashmir in case the existing ceasefire breaks down or to send a message on Kashmir.

The reported supply of DF-17 mobile, solid fueled medium range ballistic missile by China to Pakistan is to pump up Rawalpindi's ballistic missile system as the hypersonic missile is difficult to track by most existing radars and equally difficult to engage by existing surface to air missile systems including S-400 system. Mounted on a hypersonic glide vehicle, the DF-17 is said to have a combination of maneuverability and high speed that poses significant challenges to conventional missile defence. China has tested the DF-17 missile at least nine times since 2014 and is said to have 1950 km range with a speed of at least five times that of sound or Mach 5.

While India also tested its scramjet powered Hypersonic Technology Demonstrator Cruise Vehicle (HSTDV) on September 7, 2020 for launch of hypersonic missiles, the Chinese supply will clearly force Defence Research and Development Organization to speed up the indigenous project.

Keeping Pakistan under its wing for strategic purposes and reach to Arabian Sea, China has not only supplied arms to Rawalpindi but has played a spoiler to India's entry into Nuclear Suppliers Group and has gone to the extent of trying innocent Indians working in Afghanistan listed as global terrorists before the 1267 committee. It routinely sides with Pakistan in the UN over Kashmir and vetoes any attempt to list known pan-Islamic jihadi groups or their leaders as terrorists by the UNSC.

https://www.hindustantimes.com/world-news/china-supplies-mounted-howitzers-to-pak-to-maintain-arms-parity-with-india-101643261396285-amp.html

The EurAsian Times

Fri, 28 Jan 2022

China could equip Pakistan with Hypersonic DF-17 Missiles to neutralize India's 'Game-Changing' S-400 Defense System, Experts

China has been arming the Pakistani military with its top-of-the-line weapons in a bid to contain India. Beijing has aided Islamabad with fighter aircraft, submarines, naval warships, air defense systems and other military equipment.

By Sakshi Tiwari

Last week, a leading military analyst claimed that China could now equip Pakistan with hypersonic weapons which could evade India's latest acquisition – the S-400 air defense system.

Hypersonic weapons, which travel at Mach 5 speeds, or five times the speed of sound, are difficult to track and engage for air defense systems like the Russian-made S-400 that both China and India possess.

File Image: S-400 Missile

Richard D. Fisher, a senior fellow at the International Assessment and Strategy Center, testified before the US Congress about China's military advances and has written extensively about the People's Liberation Army.

"To the extent that China has supported North Korea's new hypersonic glide vehicle (HGV) missile warhead, it has or will similarly assist a Pakistani HGV, or just sell the DF-17," he told Defense News.

Given the air defense system's superior sensors and the array of missiles, the Indian Media has referred to the S-400 as a "game-changer." The S-400 employs four different types of surface-to-air missiles having a range from 40 to 400 kilometers.

The missiles are capable of shooting down a variety of targets, including fighter planes, cruise missiles, bombs, and some types of ballistic missiles which means it renders Pakistan's nuclear offense incapable.

Because of the S-400's adaptability, Pakistan has viewed India's acquisition as a danger, as the system can shoot down planes even in Pakistani airspace. The S-400's possible offensive capability, which would limit an adversary's use of its own airspace, is a significant feature. Due to Pakistan's topography and the country's long border with India, the defense system would cover a large part of the country.

It's pertinent to note that the Indian S-400 Triumf system is being stationed in Punjab state bordering Pakistan and the deployment is set to be complete by February.

Some Pakistani analysts have warned that India's overconfidence in its newly purchased S-400 air defense system could give the country a false sense of invulnerability, increasing the risk of a military mistake involving archrival Pakistan.

These assertions come two years after the Balakot airstrike that led to Pakistani fighter jets entering the Indian air space and the resultant aerial skirmish between the two sides.

Even though the two militaries signed a ceasefire last year, tension along the LoC, the de facto border in the Kashmir region, is palpable as the Indian Army accuses its Pakistani counterpart of sponsoring cross-border terrorism.

Hypersonic Missiles

A hypersonic weapon carries a glide vehicle that is installed atop a ballistic missile. It is launched into the upper atmosphere and glides the weapon to its target. The Chinese DF-17 has a range of around 2,500 kilometers and travels at speeds of between five and ten times the speed of sound, according to US intelligence estimates. The DF-17 is believed to have been commissioned by the Chinese military.

Pakistani analysts have already advocated for the development of hypersonic weapons to counter the S-400's deployment.

Like Fisher said in his assessment, one of the options available for Beijing is to either sell the DF-17 to Pakistan directly or transfer technology and assist it in developing a similar system. Further, Fisher believes that China aided North Korea's hypersonic program that manifested in two unprecedented tests recently.

"It is very likely that to the degree that China has aided North Korea's new hypersonic glide vehicle (HGV) missile warhead, it has or will similarly assist a Pakistani HGV, or simply sell the DF-17," he said, referring to a medium-range missile system equipped with an HGV. "Or Beijing now has the option of allowing North Korea to sell its HGV to Pakistan."

China has tested its hypersonic missiles on more than one occasion. Last year, a Chinese hypersonic missile went around the world. Even though it missed its target by a few kilometers, this was the first time ever that a hypersonic missile covered the entire length of the globe.

Additionally, in a shocking revelation, it was informed that the glide vehicle fired a submunition in the South China Sea in the test.

China's hypersonic capabilities have only grown with the country's expert and scientific community making frequent announcements related to the significant strides that the program was taking. In that sense, it could be assumed that China does remain in the position to arm its closest ally with hypersonic missiles to override the capabilities of S-400.

Pakistan's Hypersonic Weapons: A Far Cry

Pakistan acquiring hypersonic missiles only remains only an idea as of now, with no expectation of any such deal taking place between China and Pakistan in the near future. There are several reasons attached to it. The EurAsian Times spoke to a few experts who put the conjectures in perspective.

Military watcher Amit Mukherjee voiced skepticism about the theory. He said, "Pakistan is an ideal stooge of China to keep India off balance. India should help Taiwan the same way China helps Pakistan.

But that is not the issue here. Suitable air defense equipment against hypersonic weapons is still in its infancy. With the deployment of the S-400s, it will be more difficult for the PAF aircraft and cruise missiles to penetrate into Indian airspace.

Ballistic missiles could lead to miscalculations of an incoming nuclear strike escalating conventional war to the next level. Swarm drones may not have the range to penetrate deep into enemy airspace and dense anti-aircraft guns / anti-drone systems could effectively deal with them.

Hypersonic weapons could give Pakistan a surefire method of penetrating deep into Indian airspace to achieve the desired objectives without escalating into a nuclear war."

Philippines-based defense analyst Miguel Miranda offered a nuanced view. He said, “I have no doubts military-to-military consultations are always going on between China and Pakistan. All branches of the Pakistan military have benefited from Chinese assistance. The assumption that there are ongoing efforts related to hypersonic missiles isn’t far-fetched.

“We still don’t have any concrete evidence that a hypersonic missile — a large diameter precision munition capable of accelerating beyond Mach 5 during its flight — is being assembled in Pakistan right now although it’s likely the ‘homework’ or the research for developing one is underway.

Thanks to the sudden appearance of hypersonic nuclear-capable missiles in China and North Korea we have reason to assume these are inexpensive to assemble if the technology and production facilities are in place.

“It’s true that China can sell many types of long-range precision ordnance. It looks like its state-owned companies have free reign to export ballistic missiles and cruise missiles and everything in between.

Yet since the 1990s Pakistan’s military-industrial sector has focused on full indigenization when it comes to strategic weapon systems. Hence, the first hypersonic missile to emerge in Pakistan is likely be 100% made in Pakistan.”

Nitin J Ticku, a Defense Analyst and the Managing Editor at the EurAsian Times says — There are a few reasons why I don’t think Pakistan is going to get hypersonic missiles any time soon. First, there’s still time before China’s own hypersonic missile could be fully operational. They conducted a test last year that missed the target by a few kilometers. So, they would want to achieve more enhanced levels of precision before export could even be contemplated.

Secondly, hypersonic weapons are a highly classified technology that China may not be willing to share, like its J-20 stealth fighter aircraft. China bets big on Pakistan but there is still a trust deficit. There is always a risk of espionage and China wouldn’t be willing to risk it at this point when the US and UK do not have a hypersonic missile and China is treading very carefully.

While Pakistan acquiring hypersonic missiles from China sounds far-fetched, the country does have many long, mid, and short-range missiles in its arsenal. The Islamic nation possesses the Chinese version of the S-400 air defense system, called the HQ-9B, which, however, has a much lesser range of 240 kilometers.

Given that India faces a two-front war threat from Pakistan and China, Beijing’s defense collaboration with its “iron brother” will continue, or perhaps increase manifold notwithstanding the speculation about hypersonic weapons.

https://eurasiantimes.com/china-to-equip-pakistan-with-hypersonic-df-17-missiles-india/

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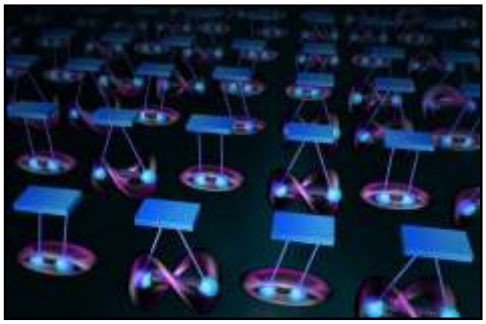
Fri, 28 Jan 2022

Vibrating atoms make robust qubits, physicists find

By Jennifer Chu

MIT physicists have discovered a new quantum bit, or "qubit," in the form of vibrating pairs of atoms known as fermions. They found that when pairs of fermions are chilled and trapped in an optical lattice, the particles can exist simultaneously in two states—a weird quantum phenomenon known as superposition. In this case, the atoms held a superposition of two vibrational states, in which the pair wobbled against each other while also swinging in sync, at the same time.



Credits:Credit: Sampson Wilcox/RLE

The team was able to maintain this state of superposition among hundreds of vibrating pairs of fermions. In so doing, they achieved a new "quantum register," or system of qubits, that appears to be robust over relatively long periods of time. The discovery, published today in the journal *Nature*, demonstrates that such wobbly qubits could be a promising foundation for future quantum computers. A qubit represents a basic unit of quantum computing. Where a classical bit in today's computers carries out a series of logical operations starting from one of either two states, 0 or 1, a qubit can exist in a superposition of both states. While in this delicate in-between state, a qubit should be able to simultaneously communicate with many other qubits and process multiple streams of information at a time, to quickly solve problems that would take classical computers years to process. There are many types of qubits, some of which are engineered and others that exist naturally. Most qubits are notoriously fickle, either unable to maintain their superposition or unwilling to communicate with other qubits.

By comparison, the MIT team's new qubit appears to be extremely robust, able to maintain a superposition between two vibrational states, even in the midst of environmental noise, for up to 10 seconds. The team believes the new vibrating qubits could be made to briefly interact, and potentially carry out tens of thousands of operations in the blink of an eye.

"We estimate it should take only a millisecond for these qubits to interact, so we can hope for 10,000 operations during that coherence time, which could be competitive with other platforms," says Martin Zwierlein, the Thomas A. Frank Professor of Physics at MIT. "So, there is concrete hope toward making these qubits compute."

Zwierlein is a co-author on the paper, along with lead author Thomas Hartke, Botond Oreg, and Ningyuan Jia, who are all members of MIT's Research Laboratory of Electronics.

Happy accidents

The team's discovery initially happened by chance. Zwierlein's group studies the behavior of atoms at ultracold, super-low densities. When atoms are chilled to temperatures a millionth that of interstellar space, and isolated at densities a millionth that of air, quantum phenomena and novel states of matter can emerge.

Under these extreme conditions, Zwierlein and his colleagues were studying the behavior of fermions. A fermion is technically defined as any particle that has an odd half-integer spin, like neutrons, protons, and electrons. In practical terms, this means that fermions are prickly by nature. No two identical fermions can occupy the same quantum state—a property known as the Pauli exclusion principle. For instance, if one fermion spins up, the other must spin down.

Electrons are classic examples of fermions, and their mutual Pauli exclusion is responsible for the structure of atoms and the diversity of the periodic table of elements, along with the stability of all the matter in the universe. Fermions are also any type of atom with an odd number of elementary particles, as these atoms would also naturally repel each other.

Zwierlein's team happened to be studying fermionic atoms of potassium-40. They cooled a cloud of fermions down to 100 nanokelvins and used a system of lasers to generate an optical lattice in which to trap the atoms. They tuned the conditions so that each well in the lattice trapped a pair of fermions. Initially, they observed that under certain conditions, each pair of fermions appeared to move in sync, like a single molecule.

To probe this vibrational state further, they gave each fermion pair a kick, then took fluorescence images of the atoms in the lattice, and saw that every so often, most squares in the lattice went dark, reflecting pairs bound in a molecule. But as they continued imaging the system, the atoms seemed to reappear, in periodic fashion, indicating that the pairs were oscillating between two quantum vibrational states.

"It's often in experimental physics that you have some bright signal, and the next moment it goes to hell, to never come back," Zwierlein says. "Here, it went dark, but then bright again, and repeating. That oscillation shows there is a coherent superposition evolving over time. That was a happy moment."

"A low hum"

After further imaging and calculations, the physicists confirmed that the fermion pairs were holding a superposition of two vibrational states, simultaneously moving together, like two pendula swinging in sync, and also relative to, or against each other.

"They oscillate between these two states at about 144 hertz," Hartke notes. "That's a frequency you could hear, like a low hum."

The team was able to tune this frequency, and control the vibrational states of the fermion pairs, by three orders of magnitude, by applying and varying a magnetic field, through an effect known as Feshbach resonance.

"It's like starting with two noninteracting pendula, and by applying a magnetic field, we create a spring between them, and can vary the strength of that spring, slowly pushing the pendula apart," Zwierlein says.

In this way, they were able to simultaneously manipulate about 400 fermion pairs. They observed that as a group, the qubits maintained a state of superposition for up to 10 seconds, before individual pairs collapsed into one or the other vibrational state.

"We show we have full control over the states of these qubits," Zwierlein says.

To make a functional quantum computer using vibrating qubits, the team will have to find ways to also control individual fermion pairs—a problem the physicists are already close to solving. The bigger challenge will be finding a way for individual qubits to communicate with each other. For this, Zwierlein has some ideas.

"This is a system where we know we can make two qubits interact," he says. "There are ways to lower the barrier between pairs, so that they come together, interact, then split again, for about one millisecond. So, there is a clear path toward a two-qubit gate, which is what you would need to make a quantum computer."

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More information: Thomas Hartke, Quantum register of fermion pairs, *Nature* (2022). DOI: 10.1038/s41586-021-04205-8. www.nature.com/articles/s41586-021-04205-8

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