May
2020

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

Volume: 45 Issue: 110 14 May 2020

रक्षा विज्ञान पुस्तकालय
Defence Science Library
रक्षा वैज्ञानिक सूचना एवं प्रलेखन केंद्र
Defence Scientific Information & Documentation Centre
मेटकॉफ हाउस, दिल्ली - 110 054
Metcalfe House, Delhi - 110 054

CONTENT

DRDO News

DRDO Technology

hindustantimes

Thu, 14 May 2020

India needs to upgrade its weapon technology for future wars

No country exports weapons that are at the top end of technology. So even with the import of weapons, the country is unable to place the best weapon or a weapon of equal technical advancement as may be available with the potential enemy

By Lt. Gen Harwant Singh (Retd)

Chandigarh: All through the history of warfare, the attempt by every country has been to place a weapon in the hands of its soldier which is better than what the potential enemy has or at least of the same quality. No military commander would contemplate arming his soldier with a weapon inferior to that with the enemy soldier.

Countries that have overlooked or relegated such imperatives for fighting a war have ended up paying a heavy price on the battlefield. Thus, when Babur appeared on the battlefield of Panipat with artillery guns, Indian troops were placed in a hopeless situation and they merely wasted their gallantry and lives attacking the guns with no matching weapon in their support. The outcome needs no recalling.

Determining Factor

Since then, weapons technology has relentlessly moved ahead and is more and more the determining factor in the outcome of battles. While the man behind the gun still matters, the scales are tipping in favour of the weapon. However at present, in this man and weapon combination, the quality of the man still holds and will be so till artificial intelligence and robotics take over.

China has successfully upgraded its weapons technology to almost match that available to, say the United States of America. In some fields, it has possibly moved ahead of America, as in the case of developing electro-magnetic guns for its naval fleet.

On the other hand, India has failed to develop its weapons technology. Though India has over four dozen establishments, manned by thousands of scientists, there is very little to their credit. Even with repeated transfer of technology in a range of weapons, they have failed to take that knowledge and technology forward.

The country continues to import 70% of its requirement of weapons and equipment. What needs to be noted in this import of weapons is that no country exports weapons which are at the top end of technology. So even with the import of weapons, the country is unable to place the best weapon or a weapon of equal technical advancement as may be available with the potential enemy.

Free DRDO of Bureacratic Control

So, why has India, with these over four dozen establishments of Defence Research and Development Organization (DRDO), failed to develop contemporary weapon technologies? It has even failed in reverse engineering. Repeated demands for a science audit of these establishments have never been met for obvious reasons. The bureaucratic control of these is the reason and an audit will reflect on the performance and consequent call for accountability.

It is only one of the three DRDO establishments dedicated to naval technology that has provided some positive results and that one establishment out of these three has always been under the control of Indian Navy, with a naval officer heading it.

The user in this case the defence services, project their requirement for a weapon or weapon system to the DRDO, through what is called General Staff Qualitative Requirement (GSQR). This GSQR spells out performance parameters and related features required of the weapon. This is normally, based on the knowledge of what has been developed and available to other armies. It may not be the very top of the line weapon asked for, because often advanced countries do not give out details of their very best weapon systems. In any case the developing agency (DRDO in this case) would take a few years to develop a weapon that meets the requirement as spelled out in the GSQR for that weapon.

By the time DRDO develops this weapon, as is often the case, further advancement would have taken place in such a weapon or weapon system. Possibly, this better weapon may already be available with the enemy, which in any case is well advanced in weapon technology.

Overhaul the DRDO

If one is to lower the essential feature of the weapon or weapons system in the GSQR to 70%, as advocated by India's Chief of Defence Staff (to do away with import of weapons), then what the DRDO (or those private enterprises that may come in this field in future) will place in the hand of the military will be far inferior than what the enemy would have.

So, what is required is not lowering the GSQR to 70% but to overhaul the DRDO, which in spite of the availability of top of the line laboratories, connected equipment and abundant funds has failed in the last seven decades, to deliver even a suitable rifle, which the army is now trying to import.

Till such time the DRDO or private industry, as and when it is brought into weapons development field, is able to develop weapons and equipment that meet the desired performance parameters, it would be advisable for the CDS to refrain from tampering with GSQRs and instead let, as of now, import of such weapons and equipment continue.

Else, we may end up in the same situation as we faced during the First Battle of Panipat.

(The writer a former deputy Chief of army staff. Views expressed are personal)

https://www.hindustantimes.com/columns/india-needs-to-upgrade-its-weapon-technology-for-future-wars/story-qU2Ta5d1tb4bBWBKXE0inL.html

Outlook
THE FULLY LOADED MAGAZINE

Thu, 14 May 2020

Novel approach to make Solid Rocket Propellant gets patent for UoH faculty

Hyderabad: The Advanced Centre of Research in High Energy Materials (ACRHEM) -- a DRDO Centre of Excellence in University of Hyderabad -- has been granted a patent for a process that finds major application in aerospace engineering and other areas.

The process patented under the title "Hydroxyl Terminated Polybutadiene (HTPB) based Polyurethanes" is the invention of Prof Tushar Jana and his associates, Dr. Bikash Kumar Sikdar and Moumita Dhara. Prof Jana belongs to the School of Chemistry, UoH, as well as adjunct faculty in ACRHEM.

Hydroxyl-terminated polybutadiene (HTPB) is a viscous liquid that has several uses. Its most important application is in solid rocket propellant (SRP) where it binds the oxidizing agent and other ingredients into a solid but elastic mass.

The present invention describes a process for the tethering of energetic molecules or nitrogen-rich molecules at the terminal end of HTPB, which has resulted in an energetic HTPB binder, and also imparted superior properties than the native HTPB.

HTPB is an inert prepolymer that contributes nearly 10-15% mass of the propellant compositions; replacing the inert mass by energetic molecules and retaining inherent properties is a very crucial step to obtain an energetic binder.

Speaking to IANS, Prof. Jana said, "We have shown a new process, what we call a synthetic method in which we showed that we do not actually change any of the properties of the HTBP. As a result we will not disturb any of the properties of the propellant which we make. We are able to produce a more energetic fluid which actually gives more energy to the system."

Indian Space Research Organization (ISRO), DRDO and various space and defence agencies across the globe employ HTPB-based binder to manufacture composite propellant systems. The inventors believe that the binder material described in this invention has very strong potential to replace the traditionally used HTPB binder in the manufacturing of solid rocket propellant.

The invention also reveals a synthetic methodology for the preparation of polyurethane (PU) with significantly high tensile properties from HTPB and various isocyanates. This will be of great help in manufacturing flexible polyurethane (PU) rubber with specific physical properties for various high-end applications such as aerospace engineering, surface coatings and surface sealants, high-performance adhesives, synthetic fibers and carpet underlay, and hard-plastic parts.

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

https://www.outlookindia.com/newsscroll/novel-approach-to-make-solid-rocket-propellant-gets-patent-for-uoh-faculty/1833200

THE HINDU

Thu, 14 May 2020

DRDO centre at UoH granted patent for rocket propellent fuel

Hyderabad: The Advanced Centre of Research in High Energy Materials (ACRHEM) — a DRDO centre of excellence at the University of Hyderabad (UoH) — has been granted a patent for "Hydroxyl Terminated Polybutadiene (HTPB)-based Polyurethanes".

HTPB is a viscous liquid with several uses, including in solid rocket propellant (SRP) where it binds the oxidising agent and other ingredients into a solid but elastic mass. It is an inert prepolymer contributing nearly 10-15% mass of the propellant compositions as it replaces the inert mass with energetic molecules yet retains inherent properties which is a very crucial step to obtain an energetic binder, said a press release.

The present invention describes a process for the tethering of energetic molecules (nitrogen rich molecules) at the terminal end of HTPB, which has resulted in an energetic HTPB binder, and has also imparted superior properties than the native HTPB.

Indian Space Research Organization, DRDO and various space and defence agencies across the globe employ HTPB-based binder to manufacture composite propellant systems, it said.

Inventors of this patent are Tushar Jana (School of Chemistry and adjunct faculty in ACRHEM), and two of his associates — post-doctoral fellow Bikash Kumar Sikder (ACRHEM) and research student Moumita Dhara (Ph.D. student in the School of Chemistry). They believe the binder material described in this invention has potential to replace the traditionally used HTPB binder in manufacturing of solid rocket propellant.

The new HTPB binder also reveals a synthetic methodology for preparation of polyurethane with significantly high tensile properties and will be of great help in manufacturing flexible rubber

with specific physical properties for various high-end applications such as aerospace engineering, surface coatings and surface sealants, high-performance adhesives, synthetic fibers and carpet underlay, hard-plastic parts etc.

https://www.thehindu.com/news/cities/Hyderabad/drdo-centre-at-uoh-granted-patent-for-rocket-propellent-fuel/article31576878.ece

Telangana Today

Thu, 14 May 2020

Patent for UoH faculty: Research in Solid Rocket Propellant

The inventors of the patent are Prof. Tushar Jana of the School of Chemistry and adjunct faculty in ACRHEM, and two of his associates- Dr. Bikash Kumar Sikder who worked as a post-doctoral fellow in ACRHEM and Moumita Dhara, Ph.D. student in the School of Chemistry

Hyderabad: The Advanced Centre of Research in High Energy Materials (ACRHEM), a DRDO Centre of Excellence in University of Hyderabad (UoH), has been granted a patent entitled 'Hydroxyl Terminated Polybutadiene (HTPB) based Polyurethanes'.

The inventors of the patent are Prof. Tushar Jana of the School of Chemistry and adjunct faculty in ACRHEM, and two of his associates- Dr. Bikash Kumar Sikder who worked as a post-doctoral fellow in ACRHEM and Moumita Dhara, Ph.D. student in the School of Chemistry.

The HTPB, a viscous liquid has several uses, one of the most important applications is in solid rocket propellant (SRP) where it binds the oxidizing agent and other ingredients into a solid but elastic mass. It is an inert prepolymer that contributes nearly 10 per cent to 15 per cent mass of the propellant compositions, replacing the inert mass by energetic molecules and retaining inherent properties is a very crucial step to obtain an energetic binder.

According to the UoH, the Indian Space Research Organization (ISRO), DRDO and various space and defence agencies across the globe, employ HTPB based binder to manufacture composite propellant systems. The inventors believe that the binder material described in this invention has strong potential to replace the traditionally used HTPB binder in the manufacturing of solid rocket propellant.

https://telanganatoday.com/patent-for-uoh-faculty-research-in-solid-rocket-propellanthttps://telanganatoday.com/patent-for-uoh-faculty-research-in-solid-rocket-propellant

THE NEW INDIAN EXPRESS

Thu, 14 May 2020

Researchers find way to better solid rocket fuel

The process developed by the UoH researchers helps tether energetic molecules (nitrogen rich molecules) at the terminal end of HTPB, which results in an energetic HTPB binder

Hyderabad: Researchers at the Advanced Centre of Research in High Energy Materials (ACRHEM) in University of Hyderabad (UoH) have been granted patent for an innovative process, that they claim would improve the quality of solid rocket fuel. ACRHEM is a DRDO Centre of Excellence in UoH.

Solid rocket fuel uses a liquid known as Hydroxyl-terminated polybutadiene (HTPB), which acts as an energetic binder in the fuel, replacing the inert mass by energetic molecules and retaining inherent properties.

The process developed by the UoH researchers helps tether energetic molecules (nitrogen rich molecules) at the terminal end of HTPB, which results in an energetic HTPB binder. This, in turn, imparts superior properties to the solid rocket fuel. As per a media release by the University of Hyderabad, the inventors of this process are Prof. Tushar Jana and two of his associates, Dr Bikash Kumar Sikder and Moumita Dhara.

University of Hyderabad

https://www.newindianexpress.com/cities/hyderabad/2020/may/14/researchers-find-way-to-better-solid-rocket-fuel-2143097.html

THE FINANCIAL EXPRESS

Thu, 14 May 2020

Focus on Make in India in defence: Projects under Make II category will go to MSMEs, says SIDM

However, critical technologies which have been designed and developed by the Ordnance Factory Board and the Defence Research and Development Organisation can gradually be shared with the private sector and MSMEs

By Huma Siddiqui

To push the Make in India initiative in the defence sector and lend a helping hand to the private sector and MSMEs, the Ministry of Defence (MoD) has started identifying projects that can be handed over to them. Sources have confirmed to Financial Express Online that "The MoD has started the process of identifying protects which can be fast-tracked and produced locally in India. This will not only help save the funds but will also help our MSMEs and the private sector."

Some projects including guns for the Indian Army, 83 Light Combat Aircraft for the Indian Air Force, small and big boats for the Indian Navy are being produced here in India. However, critical technologies which have been designed and developed by the Ordnance Factory Board and the Defence Research and Development Organisation can gradually be shared with the private sector and MSMEs.

Some projects including guns for the Indian Army, 83 Light Combat Aircraft for the Indian Air Force, small and big boats for the Indian Navy are being produced here in India.

Helping MSMEs & Private Sector

A senior officer of Society of Indian Defence Manufacturers (SIDM) told Financial Express Online that "Majority of MSMEs can take up "build to print" kind of manufacturing projects at part, component, sub-system level. This is true for all disciplines – mechanical, electrical, electro-mechanical, hydraulics, electro-hydraulics, optics and electronics etc. Some of them can do a complete system too. In technology space, many Professionals have created entities with niche expertise in electronics, communication, software, embedded software, etc."

The officer who wished to remain anonymous says "These MSMEs take up "Build to Specs" projects, at various levels- sub-system, sub-assembly, LRUs in aviation, and small systems. They can design basis specifications or even requirements, test, validate performance, integrate etc. Such MSMEs also tap existing Eco-system of manufacturing industries – metal forming, machining, precision machining, special processes including coatings, PCB manufacturing etc."

What projects can the DRDO & OFB share?

"OFB involves MSMEs only for the manufacturing of parts/sub-assembly on the build to print basis. OFs themselves are doing manufacturing under license from FOEMs. They only have drawings. With MAKE-II projects, they will start giving projects on the build to specs basis. One has to wait and see. But they have put up a lot of such requirements under MAKE-II and Import substitution," he said.

Is there a lack of clarity on projects DRDO can share with the MSMEs and SMEs?

"No, there is no lack of clarity as far as the projects Defence Research and Development Organisation (DRDO) is concerned. The DRDO is already associating with MSMEs for developmental projects. And, many SMEs are associated with DRDO. With provisions like Make II and Technology Development Fund, they can do much more now."

On plans of the government to push for indigenization of the defence projects, Puneet Kaura, Managing Director & CEO at Samtel Avionics Limited, says "The Indian defence industry, especially the indigenous and MSME players had already been under severe resource crunch in the recent past. The COVID-19 pandemic lockdown has put further stress on these companies and we have collectively been looking for some sops or support from the government. With the government making some plans to push indigenous projects through Make in India, the Indian defence manufacturing industry will receive the much-needed support to help it survive."

"The indigenous manufacturing companies and MSMEs not only form the backbone of the Indian Defence industry but also provide employment to the talented resource pool which passes out of government sponsored as well as private institutions every year. Any step by the government to support the MSMEs will generate further employment opportunities for this critical segment of our value chain," Kaura says.

Talking about his company Samtel's joint venture with the state owned Hindustan Aeronautics Ltd, Kaura says, "This JV has been a part of HAL's journey towards indigenisation for many years now, and is a key supply chain partner of HAL in multiple indigenous programs, including LCA."

And, " If the order for 83 Light Combat Aircraft (LCA) that is currently awaiting a nod from the Cabinet Committee on Security (CCS) gets approval, then not only will HAL get a boost, but being a part of the supply chain, Samtel HAL JV will also gain from it. If the government does go through with this plan as it appears, Samtel would certainly welcome it," he concludes.

https://www.financialexpress.com/defence/focus-on-make-in-india-in-defence-projects-under-make-ii-category-will-go-to-msmes-says-sidm/1958001/

THE FINANCIAL EXPRESS

Thu, 14 May 2020

Air-Independent propulsion for Kalvari class submarines: urgent need for the stealth technology

A submarine's Air-independent Propulsion (AIP) system ensures operations of the conventionally powered submarine to operate without the need for outside air

By Huma Siddiqui

A flurry of activities by Chinese and Pakistani ships and submarines in the Indian Ocean Regions (IOR), have been picked up by the Indian Navy which has been focussed on COVID operations in Malacca Straits, the Gulf of Aden and the Red Sea. During these missions, P-8I Anti-submarine multi-mission maritime patrol aircrafts also participated for ISR (Intelligence, Surveillance and Reconnaissance). The submarines were both conventional and nuclear types.

Air-independent Propulsion (AIP)

A submarine's Air-independent Propulsion (AIP) system ensures operations of the conventionally powered submarine to operate without the need for outside air. (Photo source: indiannavy.nic.in)

A submarine's Air-independent Propulsion (AIP) system ensures operations of the conventionally powered submarine to operate without the need for outside air. A Kalvari Class submarine when fitted with an AIP system onboard shall be able to run its electric propulsion motor and electrical network with the conventional batteries bypassed. This benefit reduces the need for the submarine to surface often to take in the air for running diesel engines (for battery charging). As has been reported by Financial Express Online earlier, the Kalvari class submarines are powered by conventional diesel-electric propulsion systems, and as per the original plans, the last two submarines were to be equipped with an indigenously developed AIP technology. This state of the art Fuel-cell based AIP is to be indigenously designed by DRDO since such technology from abroad is expensive.

Despite the commissioning of the first two submarines, DRDO has been unable to meet the timelines of the AIP development, which is still at a land-based laboratory. The rest of the four P75 submarines are scheduled for commissioning by 2022. Presently, the indigenous AIP system is planned to be a retrofit onboard first submarine, as and when it enters a major Refit.

Doubts are being raised by technology experts regarding the availability of a fully proven and a 'productionised' Defence Quality Assurance (QA) cleared version of AIP for fitment onboard in the near future.

India's Kalvari Class Submarines

Under the P75 Project, six Kalvari class (Scorpene) diesel-electric attack submarines (SSKs) construction is in progress at Mazagon Dock Limited (MDL), with technical support in terms of technology transfer (ToT) contracted with French Naval Group (former DCNS). Kalvari class are advance conventional propulsion stealth attack submarines designed for longer ranges while being submerged and have advance design features like very low acoustic, electromagnetic and infrared(IR) signatures. Two of these submarines have since been commissioned by Indian Navy.

A Compromised Silence Underwater

As per the OEM, Naval Group, there are two variants of 'Scorpene', the conventional propulsion system and, another one equipped with AIP. The AIP enabled submarine has a distinctive advantage over conventional propulsion, with these capable of remaining submerged on underwater patrol for three times longer. This is a huge difference when it comes to any underwater sea battle and is a game-changer. The very detection of a submarine which needs to surface even up to snorkelling depth with today's advanced aerial technology onboard maritime patrol aircraft can be sure given away. Further, the stealth is the primary weapon of any submarine on surveillance or an attack mission.

According to a senior officer who wished to remain anonymous, "An Indian submarine lacking a AIP capability is likely to be at a huge disadvantage over an AIP fitted Chinese or Pakistani submarine. AIP enabled submarines lurking underwater, can make a silent and undetected approach close to a warship or submarine, and launch a torpedo attack with a better probability of kill. This makes protection of capital ships within a Fleet Task Force highly vulnerable simply because of the hostile submarine is already elusive and can approach its torpedo firing range before being detected or engaged by even by the latest P-8I multirole maritime patrol aircraft."

Significance of Tracking Other Nations' Assets

World over, tracking of ships and submarines of non-friendly nations in international waters is a vigorously exercised option for various reasons. Such activities had reached a heightened level during the cold war era. US maritime patrol warships and aircrafts regularly dropped sonar buoys

to track Soviet submarine. The aim of such manoeuvres usually involves the collection of unique electromagnetic (EM) and acoustic signatures of the ships and submarines so as to update or append the Electronic Warfare (EW) library. And this helps in easy identification of the target in future.

Go Local

Indian Navy needs the much-desired stealth of AIP soon as it is a design capability of the Kalvari class submarine. A technology transfer of AIP system to a suitably capable local industry once DRDO's Lab version is established, shall boost the private industry under the Make in India initiative.

https://www.financialexpress.com/defence/air-independent-propulsion-for-kalvari-class-submarines-urgent-need-for-the-stealth-technology/1957766/

DEFENCE AVIATION POST
Your Connect To The World Of Defence And Aviation

Thu, 14 May 2020

Why India is not ready to become "Aatmanirbhar" in its defense capabilities?

Indian PM Narendra Modi recently emphasized the need of "Aatmanirbhar Bharat" (self-reliant India) in his address to the nation on May 12. A similar sentiment was shared by defence minister Rajnath Singh while addressing the DRDO scientists on the occasion of National Technology Day (NTD) through a video conference.

"We always have to keep in mind that there is no alternative to indigenous technology and indigenous manufacture. We will be truly self-reliant only when India succeeds in becoming a net exporter instead of a net importer of technology," said Rajnath Singh.

He added that the defence organisations are tackling the challenges by COVID-19 using the state of the art technology. He applauded the efforts of DRDO for developing more than 50 products in the last three-four months, like bio-suit, sanitizer dispenser, PPE kits, to contribute to the fight against COVID-19.

According to a report published last month by the Stockholm International Peace Research Institute (SIPRI) on Global Military expenditure in 2019, India was the third-largest military spenders in the world after the US and China.

India's military expenditure grew by 6.8 per cent to $71.1 billion. 'India's tensions and rivalry with both Pakistan and China are among the major drivers for its increased military spending,' said Siemon T. Wezeman, SIPRI Senior Researcher.

However, most of the expenditure is on importing defence equipment including the $3 billion in defence deal signed by India and the US. The deal includes the procurement of 24 MH-60R Seahawk Multi-Role Helicopters for the Navy and six AH-64E attack helicopters for the Army.

Make in India – Biggest Challenges

Under the 'Make in India' initiative by the Modi government, New Delhi has been promoting local defence production since it came to power in 2014. Currently, there are three army projects listed on the government portal namely Terminal End Secrecy Device (TESD), Tactical Communication System (TCS), Futuristic Infantry Combat Vehicle (FICV) costing a total of around 30 thousand crores.

https://www.defenceaviationpost.com/2020/05/why-india-is-not-ready-to-become-aatmanirbhar-in-its-defense-capabilities/

Defence News

Defence Strategic: National/International

TIMESNOWNEWS.COM

Thu, 14 May 2020

CDS General Bipin Rawat bats for increase in retirement age of jawans: What this could mean for India's forces

In February, Rawat had said that increasing defence pensions were becoming unsustainable and early retirement of jawans was resulting in a loss of trained manpower

New Delhi: Chief of Defence Staff (CDS) General Bipin Rawat has once again batted for an increase in the retirement age of Army jawans and IAF and Navy personnel. Rawat said that a policy decision, which will soon be made, will benefit 15 lakh personnel from the three services. Citing that the current retirement norms, which enable an Army jawan to serve only for about 15 years, result in a massive loss of trained manpower.

"I am looking at manpower costs. Why should a jawan serve for just 15 or 17 years, why cannot he serve for 30 years? We are losing trained manpower." Rawat told The Tribune on Tuesday.

This is not the first time Rawat has batted for increasing the age of jawans till 58. In February as well, Rawat had said that the three services had undertaken a study to increase the retirement age of jawans. He had said that the rise in defence pensions was becoming 'unsustainable' and endorsed the view by saying that 33 per cent of the army could go till the age of 58.

"I think one-third of the Indian Army can go till 58. Today, you are sending a chap home at 38, and he lives till around 70. So, for 17 years of service, you give 30-32 years of pension. Why not give him 38 years of service and then give him 20 years of pension? We are reversing the trend," he was quoted as saying by news agency PTI.

Behind Rawat's thought process, India's defence pensions budget which stands at Rs 1.33 lakh crore

The current budget allocation for pensions of defence services personnel stands at Rs 1.33 lakh crore. In 2019-20, the same stood at Rs 1.1 lakh crore. Rawat had thus initiated a study asking services HQs to submit detailed reports to him.

It may be noted that India has over 14 lakh personnel in the armed forces. According to a report of the standing committee on defence, as of 2019, the Army had 42,253 officers and 11.94 lakh jawans. In the Navy, the current strength of officers is about 10,000, while the number of personnel is 57,310. Currently, jawans, who do not make it to JCO rank are compelled to retire between the age group of 30-35 years.

Increasing the age group of personnel to 58 will necessarily mean that the troops will be paid for serving longer, instead of being paid pensions for services rendered for 15 years.

shttps://www.timesnownews.com/india/article/cds-general-bipin-rawat-bats-for-increase-in-retirement-age-of-jawans-what-could-this-mean-for-indias-forces/591274

TIMESNOWNEWS.COM

Thu, 14 May 2020

Indian Army Chief says force ready for Covid-19 challenge; Clarifies on face-offs along LAC

Indian Army Chief General Manoj Mukund Naravane said Army's frontline units have not been affected by COVID-19

New Delhi: Indian Army Chief General Manoj Mukund Naravane said that none of the frontline units of the Army has been affected by the COVID-19 disease and the 1.3- million-strong force is ready to guard the borders, take on the terrorists and aid the civil society in the times of need. The Army chief also clarified on the face-offs between Indian and Chinese soldiers in Sikkim and eastern Ladakh, saying that face-offs periodically occur with China's People's Liberation Army (PLA), but also rued on the incorrect reporting of the skirmishes between the Indian forces and the PLA.

Speaking exclusively to Times Now, the Indian Army chief touched on the issue of terrorism emanating from Pakistan soil. General Naravane said his force is always ready to eliminate the terrorists.

"I have been touring all the commands. Last month, I had visited the Northern Command, this month I went to the Eastern Command and Sikkim. Recently, I came back from Southwestern Command along our western front, and everywhere I went I had the opportunity to talk to the officers and the men.

"I would like to say that everyone is ready and the morale is high, notwithstanding the prevailing circumstances. The force is totally ready for whatever task assigned to them. From guarding the borders to taking on the terrorists or any aid that is required to be given to civil authorities to deal with the COVID-19 crisis, the force is ready," asserted the Army Chief.

"We are carrying out the operations in Jammu and Kashmir and whenever we carry out operations, we prepare an after-action report and based on that we draw relevant lessons and carry out the future operations on the lessons learnt."

When asked about the infiltration bids and the terror activities of Hizbul Mujahideen, Lashkar-e-Toiba and other Pakistan-based terror groups, General Naravane said, "The pattern is more or less the same and with the onset of summer, incidents of terrorist activities do increase and I don't see any different scenario this year."

"The terror infrastructure, launchpads, the terrorist activities continue to exist on the other side of the Line of Control (LoC). They will obviously try to infiltrate to carry our their nefarious designs on our side. But we have a very strong and robust grid. We have beefed up the density of troops in more critical areas and as I said everybody is totally ceased of their task and duty and we will be able to foil all the attempts be it on the LoC or in the hinterland."

Commenting on the recent face-offs with China's People's Liberation Army (PLA) in eastern Ladakh and Sikkim, the Army chief said, "Basically the face-offs periodically occur with the People's Liberation Army (PLA). This is happening because of the different perceptions on where actually the Line of Actual Control (LAC) runs and these faceoffs have occurred in the past and that is what has happened even now."

Divulging further details, he said, "It is just a matter of chance that both the faceoffs, one in eastern Ladakh and the other one in Sikkim, occurred at the same time. We should not read much into the matter and the incidents are not a part of any plan and nor are these two faceoffs interconnected or related to any domestic or international situation. These things happen when both the forces are carrying their tasks which have been assigned to them."

"We have established protocols and mechanisms to deal with this at the lowest levels, delegation level, at the highest military commander level as well. Once we talk to each other, invariably the situation does get diffused and then both sides get back."

"The fact remains that there has been some incorrect reporting as far as these faceoffs are concerned and because of the incorrect reporting it has caused embarrassment and compromised our operational plans, secrecy, and the way we do our things on the ground; even the locations mentioned were wrong," the Army Chief said.

Speaking further on the issue, he said, "The persons mentioned in some reports were not even there at the site and because of this there has been a confusion in the minds of the people who are stationed at the spot. This was highly avoidable."

"There is no troop build-up on either side. There is regular movement which happens at this time of the year. Our infrastructure work continues which is part of our long term plan and as per the plan we are building roads, bridges. Recently, the BRO had commissioned a bridge in the Daporjio area of Arunachal Pradesh and that is meant for the local population. This is a part of the infrastructure development plan and similarly, they (Chinese) are also developing their infrastructure on their side. So it is natural activities that movement of vehicles taking place in any time of the year," the Army chief further said.

When asked whether China would take offence on India's development work, General Naravane stated "There is no need to take offence. The developments which are taking place are meant for the local population. We are here to serve our people. There should be no reason for anybody to object against anything which is being done for the upliftment of the population at large."

Commenting on Prime Minister Narendra Modi's appeal to make India self-reliant and focussing on Make in India programme, the Army chief said, "As far as the self-reliance and Make in India is concerned, we have always been at the forefront of promoting our Indian products even in the defence industry."

"In the past, this has been primarily done through are defence PSUs and through are ordinance factories, but in the recent years, because of the initiatives launched by the government, the private players have been able to come into the fray and start producing items for the armed forces. As a result of that almost 75-80 per cent of the orders we had placed, both by numbers and value, have in fact gone to our own firms."

"We are totally committed to the cause of indigenisation and as far as the CSD canteens are concerned the products which are sold are Indian products only, he asserted.

When asked for his reply on Army's proposal to allow 3-year tenure for the civilians in the force, the Army chief said: "Whenever we have gone around and spoken to the youth in various places we have come across the feeling and suggestions that they would like to experience the Army life, but they do not necessarily see it as a career option."

"So taking a cue from the feedback from the youth, it is from that this idea was born that why not give them an opportunity to serve for 2-3 years and as a result of that everyone will benefit. We will benefit by getting younger manpower and the country will also benefit as when they go back to their public life, the civil society will benefit as by then they would have certainly imbibed values, traits of discipline. It will be a win-win situation for everyone.

On the issue of COVID-19 pandemic, he assured the nation that the Army is well-prepared to deal with any situation if the need arises. "We have always been very proactive in dealing with the coronavirus pandemic. From early February, we have been issuing advisories and keeping ourselves safe and the forces intact as then only we will be able to perform this dual task of guarding our frontiers, borders as well to help our citizens and civil administration in the times of need. Because of the protective measures undertaken by the Army we have successfully able to keep this pandemic at bay. None of my frontline units is affected," the Army Chief said.

https://www.timesnownews.com/india/article/exclusive-indian-army-chief-manoj-mukund-naravane-says-force-ready-for-covid-19-challenge-clarifies-on-face-offs-along-lac/591571

Thu, 14 May 2020

Army Chief General MM Naravane visits forward areas of Sapta Shakti Command

Army Chief General M M Naravane visited the forward areas of the Sapta Shakti Command in Rajasthan and Punjab on Tuesday and Wednesday, a defence spokesperson here said. Naravane, accompanied by Sapta Shakti Army commander Lt Gen Alok Kler, visited formations in the field and reviewed their operational preparedness, he said.

He interacted with troops and lauded them for their high morale and motivation. He also appreciated the operational preparedness of the command, the spokesperson said. The Army chief commended the efforts of the formations in the ongoing fight against the COVID-19 pandemic, he said.

Addressing the officers of the command, Naravane said IBGs (Integrated Battle Groups) would be made operational soon and also stressed on optimisation of funds allotted under the defence budget in view of the economic constraints due to COVID-19.

During the visit, he exhorted all ranks to continue the excellent work and to maintain the highest standards of battle readiness while ensuring force preservation to meet the emerging challenges efficiently and effectively, the spokesperson said.

https://idrw.org/army-chief-general-m-m-naravane-visits-forward-areas-of-sapta-shakti-command/#more-227356

Thu, 14 May 2020

Three years' service among new models Army is looking to use for recruitment

The three-year service model will be called 'Tour of Duty', while 'Inverse Induction' will involve personnel recruited by CAPFs spending seven years with the Army

By Amrita Nayak Dutta

New Delhi: The Army headquarters is considering two different models for recruitment in the future — one under which youth can voluntarily serve in the Army for a temporary period of three years, and the other where they are recruited by Central Armed Police Forces (CAPFs), trained and posted in the Army for about seven years, before being transferred back.

ThePrint has learnt that the recruitment models are being considered to attract more youth to join the Army, fill up officers' vacancies, and reduce burgeoning defence pensions, which make up nearly 30 per cent of the defence budget and ballooned after the 'One Rank One Pension' (OROP) scheme came into effect.

The first model, of three years' service, is called 'Tour of Duty', while the other is called 'Inverse Induction'. The latter model is based on a 2019 discussion document by the think-tank Takshashila Institution, authored by Lt Gen. Prakash Menon (retd), a former military advisor to the National Security Advisor, and Pranay Kotasthane.

Currently, the only option apart from regular permanent commission into the armed forces is the short service commission, in which officers are recruited for a period of 14 years. A large number of short service commission officers eventually opt for permanent commission, subject to eligibility.

Tour of Duty

According to Army sources, the Tour of Duty will be "three years' short service", whose pilot project will be for both officers and *jawans*, and for a limited number of vacancies.

The idea is expected to be tested on around 100 officers and 1,000 *jawans* in the first go, sources said. They will be trained for the first year of the three-year period.

If approved by the government, the Navy and the Air Force could also be asked to implement it.

A senior Army officer told ThePrint that the idea is to employ youth and let them experience military life for three years.

"This will attract youth to join the armed forces, because it will not only give them a good experience of serving for a limited duration, but also a good remuneration, and they will be relieved with a lump-sum amount, aside from other perks and benefits which come with the service," the officer said.

Past experiences from the 1999 Kargil conflict as well as the defence forces of other countries, such as Israel, show that three years is an adequate period, the officer said.

"In the Kargil conflict, officers and *jawans* with less than three years of service had shown an exemplary performance," the officer said.

It can be a "lucrative" option because apart from gaining military experience for a limited period, personnel will be free to pursue another career after three years.

"Even major corporates would welcome young, military-trained professionals instead of college freshers, and these professionals would have an edge over others while getting into another career, or even in institutions offering a MBA degree because of the work experience they will gain," the officer added.

Sources said while opting for this model will be voluntary, the government could add additional perks for those who opt for it, such as being given preference in post-graduate courses or employment in security or administrative jobs in the government sector.

In case of a battle casualty, Tour of Duty personnel would be given the same benefits as regular officers, such as liberalised family pension, ECHS facility, gratuity, and ex-servicemen status.

If implemented, the Tour of Duty model would not only bring an "exponential" reduction in defence pensions, but could make for a more attractive career option than SSC, sources said.

"Moreover, the job would offer attractive pay and allowances as compared to what fresh graduates are offered in other jobs," the officer quoted above said.

Another source said the budget saved in this way could be used in the modernisation of the armed forces.

The proposal states that the cumulative approximate cost of pre-commission training, pay, allowances, gratuity, proposed severance packages, leave encasement and other costs is nearly Rs 5.12 crore and Rs 6.83 crore respectively on a SSC officer after his retirement from service after 10 and 14 years.

It adds that the overall cost goes up even further as 50-60 per cent of the SSC officers opt for Permanent Commission and continue in service till 54 years and also get pension benefits on retirement.

"Similar costs for those released after a three-year ToD is just Rs 80-85 lakh," the officer said.

In case of jawans, that the prospective lifetime savings of just one jawan is Rs 11.5 crore, it estimates. It says the savings for only 1000 jawans could be Rs 11,000 crore, which could be pushed into the modernisation of the Army.

Inverse Induction

The Inverse Induction model will look at bringing personnel recruited by CAPFs into the armed forces' fold for about seven years, before they go back to their respective recruiting organisations.

There is an existing proposal that retired armed forces personnel be recruited by the CAPFs. But the model under consideration would flip things around.

A second senior Army officer said the Inverse Induction model will not only save on defence pensions, but will also help in training personnel better.

"Their tenure in the armed forces will provide the CAPFs with trained, battle-hardened personnel. They can also be recruited by other understaffed departments like Home Guards, Civil Defence Corps, the National Disaster Response Force (NDRF), and other security agencies," this officer said.

The Takshashila Institution's 2019 discussion document had stated that if, over time, 10 per cent of the total strength of Indian armed forces, meaning about 1.2 lakh personnel, are brought in through the Inverse Induction method, the pension bill reduction in year 15 would be Rs 6,468 crore.

"In year 16, the savings will increase to Rs 6,662 crore. In this way, the pension expenditure saved every year will keep rising," the document stated.

https://theprint.in/defence/tour-of-duty-inverse-induction-new-models-army-is-looking-to-use-for-recruitment/420936/

THE WEEK

Thu, 14 May 2020

Indian Army considering proposal to allow civilians in force for 3 years

Army has been making various efforts to attract talented young people to join it

In a transformational move, the Indian Army is considering a proposal to allow civilians including young working professionals to join the force for a three-year tenure as officers and in other ranks for a variety of roles—even of front-line fighters.

Top military sources said the "game-changing" proposal is being examined by top commanders of the Army and that its main aim is to bring people closer to the 13 lakh-strong force by giving them an opportunity to experience military life.

"If approved it will be a voluntary engagement and there will be no dilution in selection criteria. Initially 100 officers and 1,000 men are being considered for recruitment as part of test bedding of the project," Spokesperson of the Army Col Aman Anand said when asked about it.

The sources said minute details of the proposal are being worked out, adding age and fitness level will be among the key criteria for recruitment under the 'Tour of Duty (ToD) or 'Three Years Short Service' scheme.

There is a "resurgence of nationalism and patriotism" in the country and the proposal attempts to tap the feeling of the youths who do not want to join the Army as a profession but wish to experience the military life for a temporary duration, a source said.

The proposal, which is a part of broad reforms envisaged for the force, is set to be discussed at a conference of top commanders of the Indian Army following which the process would be taken forward, the sources said, adding the scheme will benefit the Army financially.

At present, the Army recruits young people under short service commission for an initial tenure of 10 years which is extendable up to 14 years.

According to the proposal, the people to be recruited under the ToD will be eligible to be deployed as combatants in key forward locations and there will be no restrictions in their roles.

The sources quoting an internal study said the Army would gain significant financial benefit from the ToD scheme as it will save a huge amount of money on gratuity, severance packages, leave encashment and pension.

Young working professionals would be allowed to apply under ToD, they said.

The Army has also made a comparative study on whether the training costs on people to be recruited under ToD will be commensurate with their subsequent limited employment for only three years.

The initial approximate financial calculations show that the financial benefits accrued would be exponential.

Sources said the cumulative approximate cost of pre-commission training, salary and other expenses is nearly Rs 5.12 crore and Rs 6.83 crore on an officer if he or she is released after 10 and 14 years respectively.

However, similar cost for those released after three years would be just Rs 80 lakh to Rs 85 lakh each.

Since, approximately 50 per cent to 60 per cent of the Short Service Commissioned Officers are granted permanent commission, the cost of their retention till attaining 54 years of age is too high.

Similarly, money saved on cost incurred by the government for a sepoy with 17 years of service as compared with a ToD sepoy with three years of service for a 17-year period would be substantial.

The savings for only 1,000 jawans could be Rs 11,000 crore which could then be utilised for the much needed modernisation of the Indian armed forces, the sources said.

They said a stint in the Army would also be helpful for young people in getting jobs in corporate as well as government sector.

An officer or soldier after completing one year of training and three years of ToD is likely to display visible improvement in self confidence, teamwork, responsibility, initiative, stress management, innovation and social skills, according to a military officer.

"Initial survey tells that all corporates would favour an individual who has been trained by military and comes to them at 26/27 years of age rather than a raw college graduates at 22/23 years of age," he said.

https://www.theweek.in/news/india/2020/05/13/indian-army-considering-proposal-to-allow-civilians-in-force-for.html

THE ECONOMIC TIMES
WWW.ECONOMICTIMES.COM

Thu, 14 May 2020

Spares supply for aircraft maintenance affected due to coronavirus pandemic: IAF

The spare support has been affected due to the distribution of the rail and road network during the ongoing nationwide lockdown due to the pandemic, IAF's Assistant Chief of Air Staff Operations (Space) Air Vice Marshal Surat Singh told ET

By Shaurya Karanbir Gurung

New Delhi: The supply of spare parts for aircraft maintenance has been adversely affected due to the coronavirus outbreak, the IAF said.

The spare support has been affected due to the distribution of the rail and road network during the ongoing nationwide lockdown due to the pandemic, the IAF told ET in a statement.

The disruption in the supply of spares is for aircraft, which are manufactured by state-run Hindustan Aeronautics LimitedNSE -0.46 % (HAL) and undergo major repairs by the company, officials said on the condition of anonymity. Several aircraft in the IAF"s inventory have been

manufactured by HAL. Spares coming from abroad have also been delayed. Servicing of these aircraft have also been affected. These aircraft are not being identified due to security reasons.

Sources at the HAL said that the supply of spares to the defence services by it has been affected, because the supply chain was "disrupted" and remained "standstill" during the lockdown. This is in regard to raw materials required for manufacturing, bought out finished parts as spares for use in sub-assemblies, assemblies, line replaceable units (LRU) repair and fresh LRUs. The delay in spares due to the pandemic has also delayed repairs.

Sources also said that HAL had to take proactive measures to ensure supply of spares. It took special permission under essential services and resumed operation in the fourth week of April. It is currently producing all indigeous spares on priority, especially for the IAF. It has already supplied some urgently required spares, which were available in stock and were being manufactured after restart of operations. However, the major suppliers of spare parts are from Russia and western countries, which are under lockdown, resulting in further delay in the supply of spares. Most of the original equipment manufacturers have postponed supplies due to the lockdown. Spares from these countries are also delayed due to pending payments from customers.

The delay in spares support, however, has not affected the IAF"s operational preparedness and COVID-19 related operations, due to the HAL restarting operations last month. IAF aircraft and helicopters have been undertaking regular sorties across India to airlift essential supplies and medical equipment, which would require regular maintenance. It has also been kept on standby to evacuate stranded Indians from abroad.

"Distribution of rail or road movement has affected spare support for maintaining aircraft," the IAF said.

It added, "flying training has been affected as the stipulated social distancing norms affect aircraft maintenance, as well as flying activities."

HAL sources added, "The pandemic has caused delays in supplies resulting in consequent delays in repairs."

"During the lockdown period, spares supply to the defence services were affected both at HAL and the company's other OEMs since the supply chain was disrupted and remained stand still. HAL took proactive measures to kick-start the functioning by taking special permission under essential services and the company resumed operations in the fourth week of April 2020," they said.

"Currently, all indigenous spares are being produced on priority. HAL has supplied certain urgent requirements of spares which were available in stock and which were under manufacturing immediately upon opening," sources added.

However, regarding western suppliers, they explained, "Major suppliers of spares are of western and Russian origin and they are currently under lockdown, resulting in spares supply delays. Spares are also delayed because most of the OEMs have invoked force majeure and postponed supplies, due to lockdown in the western countries and Russia; and difficulties in cash-flow due to pending payments from our customers."

When asked what is the HAL doing to ensure aircraft spare parts are delivered to the IAF, they explained, "HAL was the first Central Public Sector Enterprise to be accorded special approval for commencing regular production activities, which were put under lockdown due to COVID-19. Other measures include fast tracking part payments to OEM against the overdue payments and requesting them for supply of spares through special couriers, resource study for life extension of spares, sourcing from alternate suppliers and spares management from rear line aircraft under repair and overhaul.".

https://economictimes.indiatimes.com/news/defence/spares-supply-for-aircraft-maintenance-affected-due-to-coronavirus-pandemic-iaf/articleshow/75710385.cms?from=mdr

Thu, 14 May 2020

Russia simulates S-400 at the Max range of 400 km and its advantage India

By Tushkar Shirodkar

Russia recently tested 9M83M surface to air missile which is one of the Interceptor missiles of the S-400 Air Defence system against a simulated target of a short-range ballistic missile at its maximum range of 400km. Many defense analysts see this as the first technical verification of the 9M83M Interceptor missile at its indeed maximum range of 400 km for clients like India which has recently placed orders for the air defense system.

Russia has confirmed that the deliveries of the S-400 surface-to-air missile systems to India will be done by the end of 2021, India had signed a $5bn deal for S-400 missiles in 2018, drawing warnings from the United States that such an acquisition would trigger sanctions as part of a wider program against Russia.

S-400 Air Defence system which consists of four missiles in an individual container is made of 9M96E: 40 km, 9M96E2: 120 km, 48N6: 250 km and 9M83M: 400km and India have placed orders for S400 which are only made up of 48N6: 250 km and 9M83M: 400km missile interceptors so first simulated demonstration of the 9M83M at its maximum intercept range of 400 km is quite an important event for the India which is looking at the system to destroy aircraft, cruise, and ballistic missiles, including medium-range missiles at a distance of 400 km and an altitude of up to 30 km.

China reportedly has opted for 9M96E2: 120 km, 48N6: 250 km, and somewhat 9M83M is exclusive to India for the time being while many more countries are also interested in the missile system.

https://idrw.org/russia-simulates-s-400-at-the-max-range-of-400-km-and-its-advantage-india/#more-227322

Thu, 14 May 2020

India to go head with third nuclear submarine launch

Unnamed Nuclear submarine which goes by Project name "S4″ will be launched as per schedule launch window later this year amid the Chinese virus pandemic situation in the country but at the

secret facility where they were under construction work continued with a smaller workforce and it will begin again now with full force soon after easing of restrictions in the area.

INS Arighat which is a sister class ship of INS Arihant has been in the sea for time being and crew have been in self quarantined to avoid the spread of the virus in the nuclear submarine. INS Arighat is set to be inducted into the Navy after carrying out extensive trials of the submarine at the port and in the deep sea for the last two years.

S4 moving out of the dry dock will clear path for port and sea trials of the submarine which according to media reports is twice the size of the Arihant class nuclear submarines and can carry twice the number of nuclear-armed medium-range missiles like K-4 SLBM. S4 is expected to be officially inducted into Navy by 2022 and in 2021 S4* (Star) which is the sister ship of the S4 Class will be ready for launch followed by sea trials and induction by 2023.

https://idrw.org/india-to-go-head-with-third-nuclear-submarine-launch/#more-227369

ASPI AUSTRALIAN STRATEGIC POLICY INSTITUTE

Thu, 14 May 2020

Nuclear-armed submarines and the balance of power in the Indo-Pacific

By James Goldrick

The maritime strategic balance in the Indo-Pacific is changing rapidly. The future of undersea nuclear deterrent forces has strategic, operational and force structure aspects for all major powers in the region. Strategic competition in an increasingly competitive environment has a significant maritime element, which itself is profoundly influenced by the continuing importance—and progressive expansion—of the region's underwater nuclear deterrent forces.

To a greater extent than during the Cold War, both threatening and protecting such assets will be difficult to separate from other maritime campaigns. This particularly applies to potential anti-submarine warfare (ASW) operations in the East and South China Seas, as well as to India and Pakistan and to North Korea, creating uncertainty over the possibility of unplanned escalations and outright accidents.

Maintaining any kind of regional balance will, therefore, call for cool judgements on the part of all the players, judgements that will need to be continually revised in the light of technological innovation and force development.

The US Navy's nuclear-powered ballistic missile submarine (SSBN) force is central to the country's nuclear arsenal. While the navy can't be complacent about threats to the survivability of its submarines, until there are revolutionary developments in sensor technology, the combination of geography, oceanography, and platform and missile capabilities means that its at-sea deterrent will remain the most secure element of America's nuclear force and thus receive high priority in funding.

The problem for the US Navy is that it will need to start replacing the Ohio class within the next decade, but the cost of 12 new Columbia-class submarines will severely limit its ability to regenerate all the other force elements that will be required to meet the combined challenges of China and Russia.

The navy's efforts represent just one part of a strategy to push the US's competitors off balance and regain the strategic initiative. An important maritime element is likely to be undermining

China's efforts to create an underwater 'bastion'. Here, the Americans must weigh the benefits of actively threatening the security of the People's Liberation Army Navy's SSBN force against the resource commitments that that would entail, as well as the complications that it could represent for alliance arrangements, notably with Japan and Australia.

In seeking to become the predominant maritime power in the western Pacific, China has its own problems of resources and technology. However attractive the concept of an at-sea deterrent force within its nuclear inventory may be, China must first extend the range of its submarine-launched missiles and considerably improve the stealth qualities of its missile submarines if it is to create a capability sufficient to pose a credible threat to the continental United States.

Russia's challenges are in some ways parallel to those of the US, particularly its need to sustain an SSBN force while modernising the remainder of its navy. Maintaining an at-sea nuclear deterrent remains the highest priority. However, replacement of the older SSBN with the new Borey class must be consuming a very large share of the Russian navy's resources. To the SSBN program must be added the need to renew the nuclear-powered attack submarine force and continue development of the ASW capabilities necessary to secure the bastions against potential attackers. The limited money available means that Russia's maritime power-projection assets don't enjoy the same level of attention.

Japan's defence expansion, despite the tensions with China and the rise of the PLA Navy, has been relatively limited. Its most significant new elements are focused on developing amphibious forces capable of responding rapidly to any threat to the Ryukyu Islands, including the contested Senkaku (Diaoyu) Islands. Japan's ASW efforts are much less visible in, but perhaps more significant for, its maritime strategy. Japan's submarine force is slowly expanding, and the modernisation of its surface and air ASW forces continues.

Australia faces equivalent challenges. Because it is one of the few regional players with substantial high-technology capabilities, particularly in the ASW domain, Australia's assistance will be eagerly sought by the Americans, just as they have long looked to Japan. While its defence expansion remains relatively constrained—and slow—Australia's emerging force structure will provide both independent national capabilities and strategic weight in alliance terms in ways that are relatively new. Australia has been a regular presence in the South China Sea over many years, but the latest Indo-Pacific Endeavour task group deployments have been on a larger scale than the individual ship deployments of the recent past.

North Korea remains a wild card. Its efforts to develop an underwater nuclear deterrent are only a small part of the increasingly complex problem its future presents for neighbouring countries and the region as a whole.

India must balance its apparently unresolvable tensions with Pakistan against a developing strategic rivalry with China that has important maritime dimensions. The growing Chinese economic and military presence in the Indian Ocean threatens India's self-image as the dominant power in the region. India's interest in the South China Sea represents something of a riposte and a deliberate effort to complicate China's maritime strategy.

On the other hand, the entry of the first Indian SSBN into operational service and the start of its deterrent patrols may have added to India's nuclear capabilities, but they also create a hostage to fortune that the Indian Navy must factor into its dispositions. Whether Pakistan will add to India's problems by embarking nuclear weapons in its submarine force is uncertain, as is the priority that the Pakistan Navy will give to locating and tracking Indian SSBNs.

In sum, strategic competition in the increasingly competitive Indo-Pacific has a significant maritime element. Distinguishing threatening and protecting nuclear assets from routine maritime campaigns is increasingly difficult. As SSBN capabilities proliferate, and ASW technology advances, maintaining a regional maritime balance will increase in complexity.

https://www.aspistrategist.org.au/nuclear-armed-submarines-and-the-balance-of-power-in-the-indo-pacific/

DefenceNews

Thu, 14 May 2020

China used aircraft carrier to intensify incursions in the South & East China Sea – Japan

Ever since the United States' nuclear-powered aircraft carriers, USS Ronald Reagan and USS Theodore Roosevelt moved away from the West Pacific and the South China Sea, China's aggression in the region has increased.

According to Japanese defence officials, a Chinese aircraft carrier named Liaoning accompanied by two Chinese guided-missile destroyers, two multi-role warships and one supply-class fast combat support ship were spotted sailing between Japan's Okinawa and Miyakojima islands twice in the month of April.

Apart from sailing power-packed warships in Japan's territory, China has also been readily active near the disputed Senkaku Islands. In the longest streak since August 2016, for three consecutive days, four of Chinese vessels entered the waters of the Japanese territory chasing a Japanese fishing boat forcing the Coast Guard to send patrol vessels.

These uninhabited islands in the East China Sea are administrated by Japan however, China claims them as the Diaoyu. Being located in a strategically significant position, these islands, with a total area of just about 7 square kilometers are a matter of intense conflict between US and China in the Asia-Pacific region.

Tetsuo Kotani, professor of international relations at Japan's Meikai University says that "If infections spread within the U.S. military and the defense industry becomes unable to provide sufficient maintenance, China may consider it a power vacuum and move to alter the status quo in the Senkaku Islands and Spratly Islands and even with Taiwan."

It has also been reported that China has been planning to enlist the personnel of People's Armed Police Force, a Chinese paramilitary force to take charge of managing the maritime conflicts with international ships.

Currently, these maritime disputes such as conflicts with foreign fishing ships are a responsibility of the Chinese Coast Guard, however the new revision will put this duty on the military-controlled People's Armed Police Force.

The change, first in about 11 years, will also provide special permits to armed police members and enforce an effective unification of the Armed Police and the Coast Guards. Experts opine that these changes in law combined with the intensity of the incursions by China take forward its intent to control the South China Sea in the post-pandemic times.

"There is concern that while countries are busy occupied with the pandemic response, at a time of no U.S. aircraft carriers operational in the Pacific, China has moved its carrier from the East China Sea to the Pacific and then on to the South China Sea,"Professor Kotani says.

It is estimated by the United Nations Conference on Trade and Development (UNCTAD) that the South China Sea carries about one-third of the global shipping trade. About US$3.37 trillion worth of global trade passes through the South China Sea annually.

China, being the second-largest economy in the world after the US, with over 60 per cent of its trade carried by sea, Beijing's economic security is closely tied to the South China Sea.

Raising alarm bells over its maritime activities, the United States commander of the U.S. Pacific Fleet has said that "The Chinese Communist Party must end its pattern of bullying Southeast Asians out of offshore oil, gas and fisheries,".

https://www.defencenews.in/article/China-Used-Aircraft-Carrier-To-Intensify-Incursions-In-The-South-and-East-China-Sea-%e2%80%93-Japan-830610

.

Thu, 14 May 2020

China's Long March 5B rocket falls over Atlantic Ocean; largest piece of space junk in 30 years

A Chinese rocket, Long March 5B, fell back to Earth on Monday (May 11) after losing control. The body of the spent rocket became the largest piece of space junk in decades to fall towards Earth, said Spaceflight Now report.

The Long March 5B rocket was reportedly launched on May 5 from the Wenchang launch center on Hainan Island in southern China, carrying a prototype for China's next-generation crew capsule into orbit on an unpiloted test flight.

Spaceflight Now reported that the rocket's launch on May 5 marked the debut of a new configuration of China's heavy-lift Long March 5 rocket. On the Long March 5B, Chinese designers removed the rocket's second stage and replaced it with a longer volume for payloads.

The Chinese rocket, which fell into the atmosphere over the Atlantic Ocean, becoming the most massive object in nearly 30 years to perform an uncontrolled re-entry from orbit.

A prominent Harvard astrophysicist Jonathan McDowell, who tracks objects in orbit, tweeted, "It is the most massive object to make an uncontrolled reentry since the 39-tonne Salyut-7 in 1991."

The rocket body was reportedly more massive than the Chinese Tiangong-1 space station that plummeted back to Earth (presumably landing somewhere in the ocean) in 2018. It's about a fifth the mass of Skylab, which came back to Earth near Perth, Australia in 1979, a Forbes report said.

Spaceflight Now reported that the re-entry occurred less than 15 minutes after the rocket body soared almost directly over New York City. The rocket's core stage measured around 100 feet (30 meters) long and 16 feet (5 meters) wide, with a mass of approximately 20 metric tons.

Notably, dead satellites and old rocket stages regularly re-enter the atmosphere, but re-entering objects with masses of more than a few tons are rare.

The report said that uncontrolled re-entries are difficult to predict, and forecasts issued by the US military narrowed the window for the rocket's fall back to Earth in the days before re-entry.

Ground-based radars reportedly tracked the Long March 5B rocket body in space and that allowed US military officials charged with monitoring space debris to regularly measure the core stage's decaying orbit.

China has reportedly planned to launch at least three more Long March 5B rockets in 2021 and 2022 with modules for the country's planned space station.

https://www.defencenews.in/article/China%e2%80%99s-Long-March-5B-rocket-falls-over-Atlantic-Ocean;-largest-piece-of-space-junk-in-30-years-830594

EurekAlert!

Thu, 14 May 2020

Atomically thin magnets for next generation spin and quantum electronics

Stevens researchers develop a ferromagnetic semiconductor that works at room temperature, solving one of science's most intractable problems

As our smartphones, laptops, and computers get smaller and faster, so do the transistors inside them that control the flow of electricity and store information. But traditional transistors can only shrink so much. Now, researchers at Stevens Institute of Technology have developed a new atomically thin magnetic semiconductor that will allow the development of new transistors that work in a completely different way; they not only can harness an electron's charge but also the power of its spin, providing an alternative path to creating ever smaller and faster electronics.

Rather than relying on making smaller and smaller electrical components, the new discovery, reported in the April 2020 issue of *Nature Communications*, potentially provides a critical platform for advancing the field of spintronics (spin + electronics), a fundamentally new way to operate electronics and a much-needed alternative to continued miniaturization of standard electronic devices. In addition to removing the miniaturization barrier, the new atomically thin magnet can also enable faster processing speed, less energy consumption and increased storage capacity.

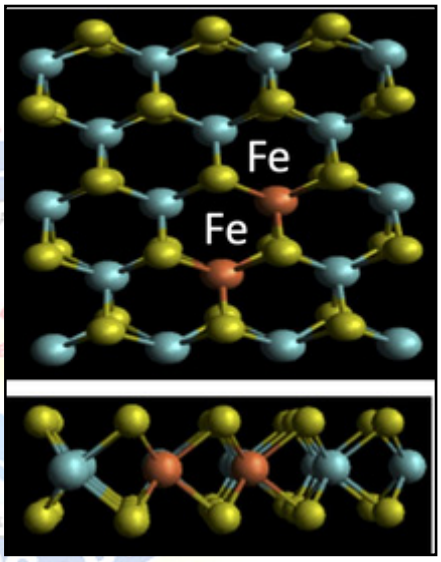

IMAGE: A ferromagnetic semiconductor semiconductor two-atoms thick. The green, blue, and red spheres are sulfur, molybdenum and iron atoms, respectively. view more

"A two-dimensional ferromagnetic semiconductor is a material in which ferromagnetism and semiconducting properties coexist in one, and since our material works at room temperature, it allows us to readily integrate it with the well-established semiconductor technology," said EH Yang, a professor of mechanical engineering at Stevens Institute of Technology, who led this project.

"The magnetic field strength in this material is 0.5 mT; while such weak magnetic field strength cannot allow us to pick up a paper clip, it is large enough to alter the spin of electrons, which can be utilized for quantum bits applications," said Stefan Strauf, a professor of physics at Stevens.

When computers were first built, they filled an entire room, but now they can fit in your back pocket. The reason for this is Moore's law, which suggests that every two years, the number of transistors that fit on a computer chip will double, effectively doubling a gadget's speed and capability. But transistors can only become so small before the electrical signals that they are supposed to control no longer obey their commands.

While most forecasters expect Moore's law will end by 2025, alternative approaches, which do not rely on physical scaling, have been investigated. Manipulating the spin of electrons, instead of relying solely on their charge, may provide a solution in the future.

Building a new magnetic semiconductor using two-dimensional materials - that is, two-atoms thick- will allow the development of a transistor to control electricity with control of the spin of an electron, either up or down, while the whole device remains lightweight, flexible and transparent.

Using a method called in situ substitutional doping, Yang and his team successfully synthesized a magnetic semiconductor whereby a molybdenum disulfide crystal is substitutionally doped with isolated iron atoms. During this process, the iron atoms kick off some of the molybdenum atoms and take their place, in the exact spot, creating a transparent and flexible magnetic material - again,

only two-atoms thick. The material is found to remain magnetized at room temperature, and since it is a semiconductor, it can directly be integrated into the existing architecture of electronic devices in the future.

Yang and his team at Stevens worked with several institutions to image the material - atom by atom - to prove that the iron atoms took the place of some of the molybdenum atoms. These institutions included the University of Rochester, Rensselaer Polytechnic Institute, Brookhaven National Laboratory, and Columbia University.

"To do something great in science, you need to get others to collaborate with you," said Shichen Fu, a Ph.D. student in mechanical engineering at Stevens. "This time, we brought all the right people together - labs with different strengths and different perspectives - to make this happen."

(Disclaimer: AAAS and EurekAlert! are not responsible for the accuracy of news releases posted to EurekAlert! by contributing institutions or for the use of any information through the EurekAlert system.)

https://eurekalert.org/pub_releases/2020-05/siot-atm051320.php

EurekAlert!

Thu, 14 May 2020

Assassin cells armed with anticancer drugs kill cancer masses

There are immune cells in our bodies that directly destroy infected or cancer cells - they are called natural killer cells. Recently, a POSTECH research team has developed an integrative cancer therapy using adoptive natural killer cell therapy and chemotherapy.

A research team led by Professor Won Jong Kim of POSTECH's Department of Chemistry developed a treatment for solid cancers using the formation of natural killer-tumor cell immunological synapse through a joint research with GI Cell. The research findings were published as a front cover for the latest online edition of *Advanced Materials*, a leading academic journal in the field of material science.

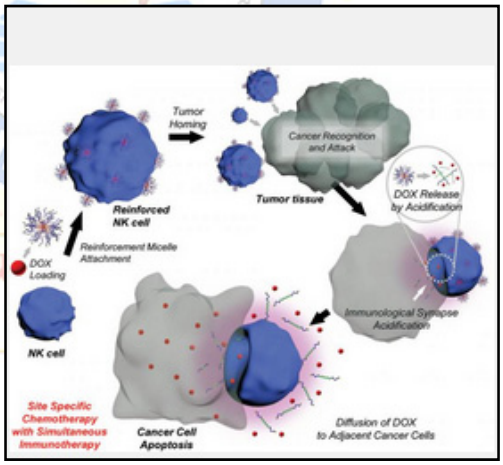

Image: Schematic illustration of the reinforced natural killer cell (ReNK) system and its anti?cancer effect upon encountering cancer cells. NK cells reinforced with doxorubicin (DOX)? loaded, acid?responsive micelles, home onto the tumor... view more

To date, three methods including surgery, radiation therapy, and chemotherapy are implemented to treat cancer. While surgery and radiation therapy are helpful in reducing the size of tumors in treating solid cancer, there is a high risk of recurrence due to residual or metastatic cells. The residual cells and metastatic cells are treated by administering chemotherapy to patients, but their use is limited due to serious side effects in all parts of the body.

However, there is an immune system in the human body that can distinguish cancer cells from normal cells and selectively induce their death, and using this mechanism in anticancer immunotherapy not only has fewer side effects but also a higher survival rate for patients compared to chemotherapy.

In particular, treatments using natural killer cells during chemotherapy have low side effects and are more effective in treating leukemia. However, unlike leukemia cells where individual cells float in blood, in solid cancers, the extracellular layer surrounding the cancer tissues reduces the penetration rate of the natural killer cells, thus lowering their efficacy. Studies are being conducted to overcome this issue.

The research team hypothesized that the acidity would decrease rapidly near the immunological synapses based on the fact that the natural killer cells form immunological synapses and secrete low acidic granules at the boundary of natural killer-tumor cells in order to induce the death of cancer cells.

Based on this hypothesis, if the surface of natural killer cells is equipped with polymeric micelles*1, which can respond to low acidity and release anticancer drugs, it may provide a pragmatic platform that allows natural killer cells to selectively release anticancer drugs in tumor cells.

It was also anticipated that cancer drugs could induce the death of cancer cells in the deep parts of the tumor as their size is small enough to penetrate the dense extracellular layer around the tumor tissues. In the treatment of solid cancer, the team fused the adoptive natural killer cell therapy and chemotherapy to overcome the low therapeutic effects and high side effects. They implemented a system that can release anticancer drugs only when natural killer cells recognize the cancer cells and induce their death.

In addition, video footages filmed using a confocal scanning fluorescence microscope confirmed that acidity was reduced in the immunological synapses formed between natural killer and cancer cells and that the ReNK*2 system selectively released anticancer drugs.

It also confirmed that the delivery efficiency to cancer tissues increased significantly when anticancer drugs were delivered using ReNK in animal models with solid cancer.

Professor Won Jong Kim, who led the study as a corresponding author, stated, "This study is significant in that it has developed a strategy to enhance the effectiveness of cell therapy using natural killer cells in treating solid cancers." He added, "This method can be applied to any cell with a simple process, so we expect to apply it to treatments currently on the market or in clinical trials."

The research was supported by the Creative Materials Discovery Program, Mid-career Researcher Program, and Bio & Medical Technology Development Program of the National Research Foundation of the Ministry of Science and ICT, and by the industry-academia research project of GI Cell. The patents related to the research were transferred to GI Cell.

https://www.eurekalert.org/pub_releases/2020-05/puos-aca051220.php

The Indian EXPRESS

Thu, 14 May 2020

Explained: Why it's important to determine whether Covid-19 can spread through sewage

Researchers have detected the coronavirus in the stool of both symptomatic and asymptomatic patients. This information has helped them identify the virus in untreated wastewater.

New Delhi: Researchers in Australia are developing a technology to help track the transmission of the novel coronavirus through waterwater. The early warning surveillance system will identify the virus by its genetic material, or the RNA (Ribonucleic Acid).

The researchers, from the University of Queensland and Australia's national science agency CSIRO, were able to prove the presence of the coronavirus in untreated sewage water in Queensland after taking samples from one suburban pumping station and two wastewater treatment plants (WWTP). They analysed the wastewater samples using RT-PCR tests, which helps identify gene fragments of the SARS-CoV-2 virus. This is also the method used by hospitals to test for the virus in human samples.

Their paper has been accepted for publication in the journal *Science of the Total Environment*.

Transmission of Covid-19 through wastewater: the research

The premise of the research was that patients infected by Covid-19 shed the virus in their stool. The researchers, in fact, detected the virus in the stool of both symptomatic and asymptomatic patients. This information helped identify the virus in untreated sewage.

As water is not the primary route of transmission for coronaviruses, it remains unclear whether these virus particles are infectious. There is also no evidence yet to prove the virus can be transmitted through the faecal-oral route.

According to Netherlands-based KWR Watercycle Research Institute, the RNA of the virus can only be stable in wastewater if it is protected by its protein coat, which otherwise would rapidly decompose. It also stated that the presence of the virus in wastewater seemed unlikely to infect people.

"We currently know too little about the possible infectious activity of coronavirus (SARS-CoV-2) particles in sewage water, but from the information that we have this far it does not seem very likely that coronavirus particles in wastewater can infect people," the institute said on its website.

Researchers from the University of Stirling, UK, **have also warned** in the journal *Environment International* that the virus could be found in human faeces — "up to 33 days after the patient has tested negative for the respiratory symptoms of Covid-19".

Another study in 2003 found the SARS virus remained infectious in stool at 20 degrees Celsius for a period of 4-5 days.

So, why is this research important?

This method of wastewater-based epidemiology (WBE) may be a useful approach to determine the approximate number of people who might be infected by the virus in an area. This is especially because several individuals do not show symptoms, making it harder to detect infectious patients.

The presence of the virus in wastewater could also signal trends in disease transmission, that is, if its spread is increasing or decreasing. However, researchers say establishing quantitative predictions using untreated samples of wastewater would be one of the "biggest challenges".

These trends, if discovered, could help decision makers increase testing more aggressively in particular areas.

On Tuesday, *The Guardian* reported that the testing method detailed by the researchers would be rolled out by Victoria's health department and that regular testing of sewage water may start in June.

https://indianexpress.com/article/explained/coronavirus-transmission-through-sewage-wastewater-6408399/

The Indian EXPRESS

Thu, 14 May 2020

New Research: Now, bowel abnormalities seen in Covid-19 patients

The retrospective study included 412 Covid-19 patients (241 men and 171 women) admitted to a single health facility from March 27 to April 10.

New Delhi: A new study, published in the journal Radiology, has identified yet another way in which the novel coronavirus SARS-CoV-2 can affect the body — by causing bowel abnormalities.

The retrospective study included 412 Covid-19 patients (241 men and 171 women) admitted to a single health facility from March 27 to April 10. Records showed that 17% of patients had cross-sectional abdominal imaging — ultrasounds, CT scans etc. Bowel abnormalities were seen on 31% of CT scans (3.2% of all patients) and were more frequent in intensive care unit (ICU) patients than other inpatients.

In a statement issued by the Radiological Society of North America, Dr Rajesh Bhayana of Massachusetts General Hospital, Boston, said: "We found bowel abnormalities on imaging in patients with Covid-19, more commonly in sicker patients who went to the ICU. Some findings were typical of bowel ischemia, or dying bowel, and in those who had surgery we saw small vessel clots beside areas of dead bowel. Patients in the ICU can have bowel ischemia for other reasons, but we know Covid-19 can lead to clotting and small vessel injury, so bowel might also be affected by this."

According to the researchers, possible explanations for the spectrum of bowel findings in Covid-19 patients include direct viral infection, small vessel thrombosis, or "nonocclusive mesenteric ischemia". They added, however, that further studies are required to clarify the cause of bowel findings in these patients, and to determine whether SARS-CoV-2 plays a direct role in bowel or vascular injury.

"Our study is preliminary, and more work is needed to understand the cause of bowel findings in these patients," Dr Bhayana said. —*Source: Radiological Society of North America*

https://indianexpress.com/article/explained/now-bowel-abnormalities-seen-in-covid-19-patients-6408654/

NewScientist

Wed, 13 May 2020

What the latest research suggests about the coronavirus in pregnancy

By Jessica Hamzelou

New Delhi: A new study, published in the journal Radiology, has identified yet another way in which the novel coronavirus SARS-CoV-2 can affect the body — by causing bowel abnormalities.

A GROWING number of case studies suggest that, while pregnant people don't seem to be at greater risk of the coronavirus, covid-19 is linked to a higher rate of caesareans and preterm births, and the virus may be able to cross the placenta to a fetus.

In March, the UK government classed pregnant people as "vulnerable" as a precaution. Back then, much of what we knew about covid-19 in pregnancy came from data from only around 20 pregnancies, but it didn't look like the virus could pass from a woman to a fetus. As more cases are collected, the picture is beginning to change.

So far, several hundred births affected by covid-19 have been reported. Based on these, many doctors and researchers say they are relieved to see that covid-19 doesn't appear to be as deadly in pregnancy as SARS, which killed a quarter of the pregnant women who had it.

In fact, the virus doesn't seem to produce any symptoms at all in most pregnant women. When a team at a New York medical centre administered a test to 215 women who gave birth over a two-week period, it found that four women with a fever or other symptoms tested positive for the coronavirus, but so did 29 women who had no symptoms whatsoever (*NEJM*, doi.org/ggr28f).

Research seems to suggest that pregnant people are at no greater risk than the general population when it comes to catching the virus or developing a severe illness. But some pregnant women have become very sick, and some have died. Marian Knight at the University of Oxford and her colleagues have collected data from 427 pregnant women admitted to UK hospitals with covid-19. Of these, three have died with the virus, while another nine remain in critical care.

We won't know how the risk to pregnant women compares with the general population until we have been able to compare pregnant and non-pregnant people of similar ages and backgrounds, says Sonja Rasmussen at the University of Florida.

The virus may have an effect on births. In Knight's study, 63 out of 247 deliveries were preterm. In a review of 108 women who gave birth with covid-19, Mehreen Zaigham at Skåne University Hospital in Malmö and Ola Andersson at Lund University, Sweden, found that around 91 per cent of the babies were delivered by caesarean section (*Acta Obstetricia et Gynecologica Scandinavica*, doi.org/ggr2rd).

In some cases, the illness may have triggered an early labour, says Edward Mullins at Imperial College London. Yet it is also possible that many babies were delivered early as a precaution, to protect the mother's health. "I can only speculate they wanted to do it in a controlled environment with protective equipment in place," says Zaigham.

One in 20 of the babies born to the mothers in Knight's study tested positive for the coronavirus, and five of the babies died. Three of the deaths appear to have been unrelated to the coronavirus, but two of them might have been, say Knight and her colleagues.

There have been reports of miscarriage and stillbirth in women infected with the virus, but it is unclear yet whether these were as a result of the coronavirus. "It's difficult to get a clear picture of the situation," says Andrew Shennan at King's College London.

But there is "fairly convincing" evidence that the virus can be passed from a person to their fetus via the placenta, says Mullins. A small number of babies born to people with covid-19 have tested positive for the coronavirus shortly after birth, and a woman who lost her pregnancy at 22 weeks was found to have the coronavirus in her placenta.

However, most studies have found no evidence of such transmission, so if it is crossing the placenta, this is likely to be rare, says Shennan.

Avoiding the virus

We don't yet know how the virus might affect a developing fetus. Some other viruses, such as Zika and the virus behind chicken pox, can harm the development of a fetus's brain and visual system, for example. The risks are thought to be especially high in early pregnancy, when organs are first developing. But when it comes to the new coronavirus, we simply don't have any information, especially when it comes to the first and second trimester, says Rasmussen.

The good news is that most newborn babies with the virus have recovered well so far. Mullins and his colleagues have launched an international project to collect data on the outcomes of pregnant people who have covid-19 and their babies. The project will specifically look at miscarriage, fetal growth, still birth, premature birth and transmission from mothers to babies. Zaigham and her colleagues are launching a similar study in Sweden.

Until we have clear answers to the questions surrounding covid-19 in pregnancy, people who are pregnant should do their best to adhere to social distancing and handwashing advice, says Rasmussen. "Right now, the important thing is that pregnant women do whatever they can to avoid getting covid-19," she says.

https://www.newscientist.com/article/mg24632823-400-what-the-latest-research-suggests-about-the-coronavirus-in-pregnancy/