

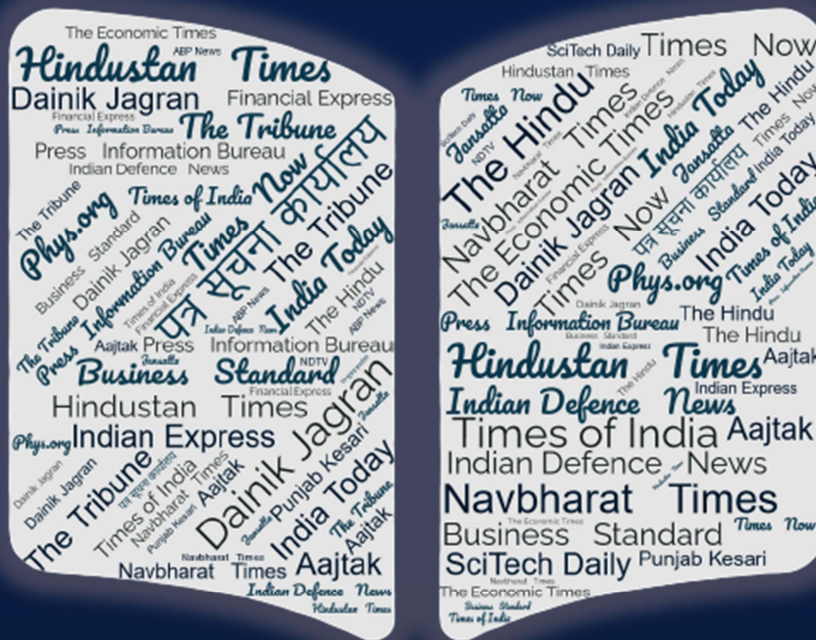
September
2022

समाचार पत्रों से चयित अंश Newspapers Clippings

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

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Defence News

Defence Strategic : National/International



Press Information Bureau
Government of India

Ministry of Defence

Mon, 26 Sep 2022 4:57 PM

INS Tarkash in Port Gentil, Gabon First Ever Visit by an Indian Naval Warship

INS Tarkash made a port call at Port Gentil, Gabon as part of her ongoing deployment in the Gulf of Guinea for anti-piracy patrol. This marks the first visit by any Indian Naval Ship to Gabon. During her stay in harbour, the ship and her crew will participate in official and professional interactions as well as sports fixtures. Her professional interactions will include discussions and drills on fire fighting and damage control, medical and casualty evacuation issues, and diving operations. There will also be familiarisation visits. In addition, yoga sessions and social interactions are also planned. The ship will also remain open to visitors.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1862275>



Press Information Bureau
Government of India

Ministry of Defence

Mon, 26 Sep 2022 11:03 AM

INS Sunayna in Seychelles Indian Navy's Maiden Participation in Combined Maritime Forces Exercise

INS Sunayna entered Port Victoria Seychelles on 24 Sep 22 to participate in the annual training exercise Operation Southern Readiness of Combined Maritime Forces (CMF). This not only reinforces Indian Navy's commitment to maritime security in the Indian Ocean Region but also marks the maiden participation of an Indian Navy ship in CMF exercise. The ship is scheduled to participate as associate partner in the capacity building exercises being conducted by CMF. The joint training exercise is being attended by representative delegations from USA, Italy, Australia, Canada, New Zealand and ship participation from UK, Spain & India. During her port call, professional interactions with participating nations are planned.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1862198>



**Press Information Bureau
Government of India**

Ministry of Defence

Mon, 26 Sep 2022 7:05 PM

Visit of Bangladesh Navy Operational Sea Training Group to SNC

An eight member delegation from the Bangladesh Navy Operational Sea Training Group (BNOSTG) visited Headquarters Sea Training at Kochi to witness Operational Sea Training at Southern Naval Command. As part of the orientation training, interactive session along with practical classes on seamanship, firefighting, damage control, first aid and safety at sea were conducted. The interactive sessions also provided an opportunity to exchange the best practices followed. The BNOSTG visited various training facilities and simulators which provided a professional insight into operational sea training. The visit reemphasises Indian Navy being the preferred training destination adopting evolving tactics and technologies.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1862324>

The Tribune

Tue, 27 Sept 2022

India Peace Loving, but not Afraid of War, Says Rajnath Singh

Union Minister for Defence Rajnath Singh today said, “India is a peace-loving country but it should not be mistaken that we are afraid of war. India has never attacked any country, nor has it captured an inch of foreign land. However, if any attempt is made to disturb harmony, a befitting reply will be given.” The minister, while addressing a rally of ex-servicemen in Kangra, said, “At a time when we were dealing with Covid, we faced tension on the northern front with China. The courage of our soldiers during the Galwan incident proved that no matter how big the power is, India will never bow down.” He felicitated the families of martyrs of armed forces hailing from Himachal Pradesh at a ceremony organised at Badoli in Kangra district.

He paid tributes to Param Vir Chakra (PVC) awardees Major Somnath Sharma (1947), Lt Col Dhan Singh Thapa (1962), Captain Vikram Batra (1999), Subedar Major Sanjay Kumar (1999) and Maha Vir Chakra awardee Brig Sher Jung Thapa (1948). He said their names are etched in the hearts of every Indian for their unmatched bravery and sacrifice. On the 2016 surgical strikes and the 2019 Balakot airstrike, Rajnath said India’s new strategy against terrorism has broken the back of those who tried to attack unity and integrity of the nation. He said, “Earlier, India was an importer of defence equipment. Today, it is one of the top 25 exporters in the world. From about Rs 900 crore eight years ago, defence exports have crossed Rs 13,000 crore. We are hopeful that

the exports will touch Rs 35,000 crore by 2025 and a target of Rs 2.7 lakh crore worth exports set for 2047 will be met,” he said.

Rajnath said the post of Chief of the Defence Staff and the Department of Military Affairs are some of the major reforms taken to bolster the national security. “The doors of the National Defence Academy (NDA) have been opened for girls and women in the Armed Forces are being given the permanent commission. We have opened the way for deployment of women on warships,” he said. Rajnath said, “Himachal is strategically important for India and people are strategic assets. Hundreds of kilometres of roads, bridges and tunnels have been constructed in border areas with the Atal Tunnel being one of the mega projects.” He said India’s victory in the 1971 war will be remembered in the history as a war fought for humanity rather than for property, rights or power. The names of General Sam Manekshaw, Lt Gen Jagjit Singh Aurora, Lt Gen JFR Jacob, Major Gen Sujjan Singh Uban and Air Chief Marshal IH Latif, who led India to a resounding victory, would never be forgotten.

<https://www.tribuneindia.com/news/himachal/india-peace-loving-but-not-afraid-of-war-says-rajnath-435640>



Mon, 26 Sep 2022

Defence Body Warns Staff about Bogus Whatsapp Like App that Collects User Login Information

The Controller General of Defence Accounts (CGDA), which oversees the Ministry of Defense's Defence Accounts Department (DAD), recently warned its employees about a cyber security threat in which users were being targeted by a fake WhatsApp-like app to trick them into providing their login information. According to the circular, which Moneycontrol reviewed, CGDA received input on this from the Ministry of Defence and government agencies, and they have urged employees not to install malicious applications and to verify the legitimacy of websites. This is important because the DAD is in charge of payment, providing financial advice, conducting internal audits, and accounting of the expenditure and receipts of the Armed Forces, including the Coast Guard, Defense Research and Development Organization laboratories, and defence ordnance factories.

Moneycontrol has reached out to the Controller General of Defence Accounts (CGDA) with queries in this regard, and the story will be updated when a response is received. According to the CGDA's August 24 circular, a face messaging app called WHSAPP.APK that mimicked WhatsApp was embedded with malicious content. “This HQrs (headquarters) have been received inputs (sic) from MoD and credible Govt Agency that a new squatting campaign is being used by threat actors to target users and convince them to hand over their login credentials,” the circular read. Squatting, also known as cybersquatting, is the fraudulent act of registering domain names that appear to be related to already-existing domains or brands with the intention of making money off of user errors, according to Palo Alto Networks, a US-based cybersecurity firm.

“The above-mentioned domain names (WHSAPP.APK) would mislead users into believing them to be associated with the popular chat application WhatsApp. The site can be utilised for phishing consumer credentials, hosting malicious payloads, disinformation etc,” the circular added. Such domain name squatting vectors were urged to be blocked in "perimeter security devices like firewalls and UTM's (Unified Threat Management) installed (sic) at their offices the internet," according to the circular that was distributed to offices and personnel within the CGDA's jurisdiction. The CGDA advised staff to avoid installing malicious software, confirm the legitimacy of any website by looking up its address, and find out a website's correct domain name by looking it up on "known search engines like Google, Bing, etc."

Rising attacks

The timing of this circular coincides with the recent targeting of numerous Indian government websites and applications by foreign "hacktivists". A recent research by India-based cybersecurity company Cloudsek revealed that various state government websites from Gujarat, Uttar Pradesh, Assam and Tamil Nadu were attacked by the hacktivist group known as "Mysterious Team Bangladesh." This group engaged in distributed denial of service (DDoS) attacks, which Cloudflare defines as a malicious attempt to obstruct a website's regular traffic and overwhelm its servers with a barrage of Internet traffic.

The National Informatics Centre, a division of the Ministry of Electronics and Information Technology that manages all IT-related developments for government ministries and departments, released a 10-page manual for government employees in June that outlines the ‘Dos and Don'ts’ when handling computer systems. In the directive, employees were advised not to share sensitive details on social media or third-party messaging apps, to research an app's popularity and read user reviews before downloading it, and to only download programmes from Google Play or Apple's respective app stores.

<https://www.moneycontrol.com/news/business/defence-body-warns-staff-about-bogus-whatsapp-like-app-that-collects-user-login-information-9230671.html>

एक और एयरक्राफ्ट को उड़ाया जाएगा बायोफ्यूल से

Poonam.Pandey@timesgroup.com

■ नई दिल्ली : भारतीय वायुसेना अब अपने ट्रांसपोर्ट एयरक्राफ्ट एएन-32 के बाद डॉर्नियर एयरक्राफ्ट को भी बायोफ्यूल के साथ उड़ाने की तैयारी कर रही है। डॉर्नियर पर अभी ग्राउंड टेस्ट चल रहे हैं, जिसके बाद डॉर्नियर एयरक्राफ्ट पर भी एविएशन फ्यूल में 10 पर्सेंट बायोफ्यूल मिक्स कर उड़ाने का परीक्षण होगा।

वायुसेना के एक अधिकारी के मुताबिक, ट्रांसपोर्ट एयरक्राफ्ट एएन-32 को 10 पर्सेंट बायोडीजल के साथ 200 घंटे उड़ाने की तैयारी चल रही है। यह अगले छह महीने का लक्ष्य है। एएन-32 ने पहली बार दिसंबर 2018 में 10 पर्सेंट बायोडीजल को एविएशन टर्बाइन फ्यूल के साथ मिक्स कर उड़ान भरी थी। अब तक एएन-32 इस तरह 65 घंटे उड़ान भर चुका है।

अधिकारी के मुताबिक इसका प्रदर्शन



इंजन बनाने वाली कंपनी ने कहा है कि 50 पर्सेंट बायोफ्यूल के साथ उड़ सकता है डॉर्नियर

काफी संतोषजनक रहा। इसके बाद यह 10 पर्सेंट बायोफ्यूल मिक्स कर अपनी पहली उड़ान भर सकेगा। डॉर्नियर में जो इंजन लगा है, उसके निर्माताओं का दावा है कि यह 50 पर्सेंट बायोफ्यूल मिक्स करके भी उड़ सकता है।

बायोफ्यूल से बचत : एयरफोर्स का सालाना फ्यूल खर्च 2021-22 में 6.2 लाख किलोलीटर था। अगर बायोफ्यूल का इस्तेमाल होने लगे तो यह एविएशन फ्यूल पर निर्भरता कम करेगा।

Defence Exports Grown by 334 Per cent in Last Five Years India Exporting over 75 Countries Make in India

Union minister for defence, Rajnath Singh, on Monday felicitated families of soldiers who laid down their lives while serving the nation. "The Armed Forces will always be a source of inspiration to the people, especially the youth, as they possess the traits of discipline, devotion to duty, patriotism & sacrifice and are a symbol of national pride & trust," the minister said at the event at Badoli, Kangra in Himachal Pradesh. Singh added that India is the only country which has given the message of peace to the whole world. "If any attempt is ever made to disturb the harmony in India, a befitting reply will be given.

At a time when we were dealing with COVID-19 along with the entire world, we had to face the tension on the northern border with China. The courage of our soldiers during the Galwan incident proved that no matter how big the power is; India will never bow down." The minister said, "India's new strategy against terrorism has broken the backs of those who try to hurt the unity and integrity of the Nation. Terror activities were carried out from across the border in Pakistan under a well thought out policy. After the Uri and Pulwama attacks, our government and the Armed Forces, through the 2016 surgical strikes & 2019 Balakot airstrikes, displayed to the world India's unwavering commitment to root out terrorism."

Addressing the government's resolve to make the country strong and 'Aatmanirbhar', he said, "Earlier, India was known as a defence importer. Today, it is one of the top 25 defence exporters in the world. From about ₹900 crore eight years ago, defence exports have crossed ₹13,000 crore. We are hopeful that the defence exports will touch ₹35,000 crore by 2025 and the target of ₹2.7 lakh crore worth of defence exports set for 2047 will be met." Singh added that the doors of National Defence Academy have been opened for girls, women in the armed forces are being given permanent commission.

<https://www.livemint.com/news/india/defence-minister-felicitates-families-of-soldiers-11664192910517.html>



Dependence on Russian Defence Equipment not Lack of Trying on India's Part: Jaishankar

India's dependence on Russian defence equipment and the strong defence ties with Moscow is not because New Delhi did not approach the U.S. to get those from the United States, External Affairs Minister S. Jaishankar said Sunday. "One of the changes in our relationships has actually been the defence cooperation which has really come about in this current form maybe the last 15 years," Mr. Jaishankar told Indian Americans in Washington during an interactive discussion

with him organised by the U.S. India Friendship Council and Foundation for India and Indian Diaspora Studies. "From 1965 pretty much for the next 40 years, there was no U.S. defence equipment to India. This was, in fact, a period when the India Soviet, India Russia relationship became very strong," he said.

"This was not due to a lack of trying on India's part. I can vouch for it myself. I've had my relatives, my father, my grandfather, they worked with the defence ministry. So, I know firsthand what great efforts were made over those years to try to make the U.S. understand that it was in American interest to have a strong, united, independent, prosperous India," Mr. Jaishankar said. "At that time, they did not succeed, maybe the state of the world was such," he noted. "The change that started was really triggered by the nuclear deal that removed a very big obstacle to go forward and then to actually take the relationship to a new level requires leadership in India," that did not had reservations. "It takes two hands to clap. It was not just that all the problems are on the American side they were visitations on the Indian side as well," he said.

"So we also have to address the institutions on our side. I think today, the relationship is on a very different footing. We have possibility of working together in many more areas, especially the security domain. Some of our major exercises are with the American military. We fly a number of American planes today, the C 17," the minister said. Very bullish on the future of the India-U.S. relationship, he said: "I think there are really deep convergences, which will sustain it over many, many years."

<https://www.thehindu.com/news/national/dependence-on-russian-defence-equipment-not-lack-of-trying-on-indias-part-jaishankar/article65937247.ece>

THE ECONOMIC TIMES

Mon, 26 Sep 2022

UAE Air Force Commander Meets IAF Chief

Commander of the UAE Air Force and Air Defence Maj Gen Staff Pilot, Ibrahim Nasser Mohamed Al Alawi on Monday met IAF chief Air Chief Marshal V R Chaudhari and discussed ways to enhance the existing bilateral ties. Both the chiefs also talked about means to strengthen cooperation in areas of mutual interest, the IAF said. "Major General Ibrahim Nasser Mohamed Al Alawi, Commander UAE Air Force and Air Defence called on Air Chief Marshal V R Chaudhari today. The two Chiefs discussed ways & means to enhance existing bilateral ties & strengthen cooperation in areas of mutual interest," the IAF tweeted. The Twitter handle of the Indian Air Force (IAF) also shared a couple of pictures of the meeting of the two chiefs. The Army, in a tweet later, said he also met the Indian Army's vice chief.

"Major General Staff Pilot Ibrahim Nasser Mohamed Al-Alawi, Commander of the Air Force and Air Defence #UAE called on Lieutenant General BS Raju #VCOAS and discussed ways to enhance Bilateral Defence Cooperation," it said. Meanwhile, in another tweet, the IAF greeted the Military Engineer Services (MES) on its 100th Raising Day. "Air Chief Marshal VR Chaudhari and all air warriors felicitate all personnel of the Military Engineer Services on the occasion of their 100th Raising day. We acknowledge and appreciate the yeoman service rendered by MES over the years and the key role played by them in nation building," it wrote on

the microblogging site. The Army and Navy also joined in greeting the personnel on the landmark MES Day.

"On the occasion of 100th Military Engineering Service Day, Engineer-In-Chief congratulates all #MES personnel and exhort them to remain prepared to meet emerging challenges & organisational needs and continue dedicating themselves towards Nation Building #IndianArm," the Army tweeted.

https://m.economictimes.com/news/defence/uae-air-force-commander-meets-iaf-chief/amp_articleshow/94453194.cms

ThePrint

Mon, 26 Sep 2022

ITBP or Army? Questions Arise on who will Lead Patrolling as LAC-China Tensions Continue

With disengagement on at five stand-off positions along the Line of Actual Control (LAC) even as the larger question of de-escalation remains, the government is considering on whether the Indo Tibetan Border Police (ITBP) or the Army should take the lead role for patrolling the borders with China, ThePrint has learnt. The Ministry of Home Affairs (MHA) wants the ITBP to take a lead role but the Army is opposed to it and wants the central armed police force to be put operationally under its control, sources in the defence and security establishment said. Raised in 1962 exclusively for guarding the borders with Tibet and China, the ITBP is under the MHA's operational control but works closely with the Army. All LAC patrols are carried out by a joint team of the Army and the ITBP. At times, the Army takes the lead role while ITBP, too, assumes the lead role when it comes to patrolling.

Sources explained that it is the local Army brigade which decides on the patrolling patterns and who takes the lead role. ThePrint had in July 2020 reported that the government was considering a more prominent role for the ITBP in LAC management with the Army taking charge of border defence. The discussion had taken a backseat but fresh media reports suggest that the proposal is back on drawing boards. As per the original proposal which was being considered, the Army will be away from grey zone areas of the 3,488 km long LAC, especially since both India and China are creating buffer zones in locations where they have disengaged. The grey zones refer to areas where the forces from both countries patrol and come face to face. The Army argues that the ITBP cannot be given the lead role and that the force needs to come operationally under it for better coordination.

Incidentally, as ThePrint reported earlier, there have been multiple clashes between Indian and Chinese troops, more than what was publicly known in Ladakh during May and June in 2020. These included physical clashes and brawls between the two sides at various locations, including multiple patrolling points and along rivulets and nallahs in Eastern Ladakh where the ITBP were also involved. The ITBP personnel were awarded with 20 gallantry medals for their action against Chinese troops in 2020. Sources said the idea behind giving the ITBP a more active role is that it is a police force and sends out the right message that it is the police forces who man the

borders and not the Army. “In most countries, it is the paramilitary or specialised border guarding forces which man the borders with the military staying behind,” one of the sources said.

Following the Group of Ministers (GoM) report after the Kargil conflict that recommended ‘One Border One Force’, ITBP was assigned the entire LAC in 2004, replacing Assam Rifles in Sikkim and Arunachal Pradesh. Arguments supporting Army’s operational control of ITBP. The defence establishment feels that the LAC is an active border, and hence the Army should get the lead role with the ITBP under its control like the Assam Rifles. This is not the first time the Army has expressed this plan. In 2015 when Defence Minister Rajnath Singh was the then Home Minister, the Army had proposed the same. But the proposal was shot down, a decision which had the nod of then defence minister Manohar Parrikar, the sources said. Defence sources point out that India has “unsettled and active borders” both on its western and northern borders with Pakistan and China. While the operational responsibility along both these is that of the Army, it is augmented with the deployment of BSF and ITBP, respectively.

“Since this arrangement involves multiplicity of forces on the same border, it has its connected challenges of lack of accountability and coordination of command and control,” another source said. Talking about the 2001 GoM report on LAC, the sources said it has suggested that till such time these ‘active’ borders are fully demarcated, the ITBP deployed along these should be placed under the Army’s operational control. Para 5.21 of the report, according to the sources, state that in order to enable speedy response to emerging situations, since this border is operationally active, the ITBP deployed on this sector should be placed under the operational control of the Army till such time as these portions of the border are fully demarcated. “Borders which are operationally active should be the responsibility of the Army. Any other Forces, if deployed to guard these, owing to their special skills etc should be placed under the direct operational control of the Army,” it said.

“The entire border with China should be guarded by the ITBP and it should be placed under the operational control of the Army until such time as the border is demarcated,” the report added. Sources also pointed out that all meetings along the border are under the aegis of the Army. Similar arrangement is followed by the People’s Liberation Army (PLA), as the PLA officers head the meetings attended by officers of its Border Defence Regiments (BDRs). Similarly, the existing hotlines are between the Indian Army formations and PLA formations and, hence, there is no need for any separate line for the ITBP. A third source said unlike ITBP, the BDRs are an integral part of the Chinese army and not a central armed police force. These units are equipped and trained in a similar manner to that of PLA battalions unlike the ITBP, the sources said. Moreover, with the forward deployment of PLA forces, there is no method to distinguish between troops of regular PLA units or of the Border Defence units, the sources argued. “Given the sensitivities of India-China border and in consonance with GoM recommendations, the Army should continue to have the lead role in managing the border with ITBP placed under operational control,” the third source said.

Arguments against operational control of Army

Explaining why the ITBP should not be brought under the control of the Army, sources argued that the border guarding force acts as the parallel eyes and ears of the government. ‘The government assesses a situation and makes decisions not based on one agency but several others. Even in the current stand-off, ITBP inputs were useful,’ said a source in the security establishment. The source pointed out that the Army and the ITBP have very distinct channels

of communication, which would not be possible if the central police force comes under operational command of the Army. Sources argued that ITBP was given the responsibility of the entire LAC in 2004 precisely under the principle of 'one border, one force' as recommended by the GoM. Asked about the GoM's recommendation that the Army should be the lead agency, the sources said a decision was taken to have police border guards in the front for signalling and management while the Army focuses on capacity building and defending.

The ITBP is a specialised force which trains in mountain warfare and has been looking after the LAC since 1962, they argued. Even in the current stand-off, they said, the ITBP has been standing shoulder to shoulder with the Army and has been involved in clashes while sticking to the Standard Operating Procedures (SOPs) given by the government. Besides being a parallel eyes and ears for the government, the ITBP cannot be brought under the Army's operational command because it has multiple tasks, MHA sources said. "ITBP personnel are also deployed for law and order duties, besides internal security operations. If they come under the Army, the dual capability will be gone," a source said.

They also argued that the ITBP has operationalised and are manning a number of forward posts and has been undertaking multiple long-range patrols, including that last for over 30 days. 'The ITBP is well-armed but does not have its own artillery or armoured elements. But then it is the same reason why it is the ITBP and not the Army. The Army will step in when they have to, but border management should ideally be done by the border forces and not the Army,' a second source said.

<https://theprint.in/defence/itbp-or-army-questions-arise-on-who-will-lead-patrolling-as-lac-china-tensions-continue/1142825/?amp=>

नवभारत टाइम्स

मंगलवार, 27 सितंबर 2022

रूस-यूक्रेन युद्ध बदल रहा है मिसाइलों का भविष्य

रूस-यूक्रेन के बीच जारी जंग ने बता दिया है कि भविष्य के हथियार एकदम अलग होंगे। आइए जानते हैं भविष्य के बड़े मिसाइल सिस्टम के बारे में

AGM 88 HARM मिसाइल



यह अमेरिका की बनाई एंटी रेडिएशन मिसाइल है।

स्टेटस

- यूक्रेन, अमेरिका यह मिसाइल सिस्टम यूज कर रहा है
- भारत के पास ऐसी मिसाइलें हैं, लेकिन इतनी सटीक नहीं

100% मारक क्षमता।

1.84 माक स्पीड।

जैवलिन/ न्यू जनरेशन लाइट एंटी टैंक वेपन



टैंक-रोधी मिसाइलें। इलेक्ट्रॉनिक-काइनेटिक हमलों में कारगर। एक आदमी इन्हें दागकर भाग सकता है।

स्टेटस

- यूक्रेन ने इनसे रूस के 1000 टैंक किए तबाह
- भारत के पास सेकंड जनरेशन की 6000 टैंक रोधी मिसाइलें

भारत के पास

इस्राइली थर्ड और फिफथ जेन एंटी टैंक मिसाइलें, स्पाइक ATGS लॉन्चर, नाग मिसाइल कैरियर, नामिका सीमित संख्या में हैं

अब लड़ाइयों के नतीजे प्रिजीजन गाइडेड स्युनिशन तय कर रहे हैं। इन्हें विमानों, हेलिकॉप्टरों, ड्रोनो, जमीन पर तैनात सिस्टम से छोड़ा जाता है।

- **ले. जन. एचएस पनाग (रिटा.)**

भारत को ऐसी मिसाइलें चाहिए जो पिन पॉइंट एक्जुरेसी के साथ बड़ा एरिया कवर करें। ICBM का एक बैलेस्टिक पाथ होता है तो सरप्राइज उतना ज्यादा नहीं होता। हाइपरसोनिक मिसाइलों की जो स्पीड होती है, वह इस समय के मिसाइल डिफेंस को भी तोड़ सकती है। इस पर ध्यान देने की जरूरत है। दुनिया इसी में आगे बढ़ रही है।

- **हरष पंत, डिफेंस स्पेशलिस्ट**

M142- हिमार्स

यह अमेरिकी हाई मोबिलिटी आर्टिलरी रॉकेट सिस्टम है।

9-480 किमी

रेंज है रॉकेट।

16,000 किलो

है कुल वजन।

3 तरह की मिसाइलों के लॉन्चर

स्टेटस

- यूक्रेन ने इसे रूस के खिलाफ कारगर तरीके से इस्तेमाल किया है
- भारत के पास हैं स्मर्च और पिनाका सिस्टम
- भारत के सिस्टम की सटीकता उतनी बेहतर नहीं
- स्मर्च और पिनाका की रेंज भी उतनी नहीं



दुश्मनों के लिए DRDO कैसी खामोश मौत बना रहा है? इस पर लेख पढ़ने के लिए यहां स्केन करें और navbharatgold.com पर जाएं

हथियारबंद ड्रोन

अमेरिका के 700 रिचब्लेड, 700 फीनिक्स घोस्ट, रीपर ड्रोन बेस्ट माने जाते हैं।

स्टेटस

- यूक्रेन इन्हीं से रूसी टैंकों, तोपों और उसकी सेना को निशाना बना रहे
- भारत के पास अच्छा सशस्त्र ड्रोन नहीं है

3.2 करोड़

डॉलर है रीपर की कीमत।

भारत के पास

- इस्त्राइली सर्चर-1,2, हेरोन, हार्प कामिकाजी
- अमेरिका से 30 एमक्यू 9वीं ग्लिडिंग स्काई/सी गार्डियन ड्रोन की डील अधर में



सबसे बड़ी मिसाइलें

रूस	चीन	अमेरिका	नॉर्थ कोरिया	भारत
RS-20V (SS-18 Satan)	DF-41 (डॉनाफेंग)	LGM-30 Minuteman	ताइपो डॉन्ग-2	अग्नि-6 मिसाइल
10,200 से 16,000 किमी	12,000 से 15,000 किमी	10,000 किमी से ज्यादा	10 से 15000 किमी	8 से 10000 किमी

स्रोत : मिसाइल शेट मैगजीन, आर्म्स कंट्रोल असोसिएशन

सबसे तेज मिसाइलें

- 1 ब्रह्मोस-2 भारत, स्पीड: 7-8 माक
- 2 ब्रह्मोस NG भारत, स्पीड: 3.5 माक
- 3 एयर-सोल मोएने पोर्ती फ्रान्स, स्पीड: 3 माक
- 4 पी-700 रूस, स्पीड: 2.5 माक
- 5 AGM हाउंड डॉग अमेरिका, स्पीड: 2.1 माक

कंटेंट : अरुणेश पठानिया,
ग्राफिक्स : अर्जुन सिंह



'You're not Fooling anybody...' Jaishankar Responds to US F-16 Package for Pakistan

External Affairs Minister S Jaishankar has raised questions over the "merits" of the US-Pakistan relationship and said that Washington's ties with Islamabad have not served the "American interest". "It's a relationship that has neither ended up serving Pakistan well nor serving the American interests," Jaishankar said at an event organized by the Indian American community in Washington on Sunday. The remarks were made when the Indian minister was questioned by the audience on US action on F-16 fighter jets with Pakistan. Just weeks ago, for the first time since 2018, US State Department approved a Foreign Military Sale (FMS) to the Government of Pakistan for the sustainability of the Pakistan Air Force F-16 fleet and equipment at the cost of USD 450 million. Defence Minister Rajnath Singh promptly conveyed to US Defence Secretary Lloyd Austin India's concerns over Washington's decision to provide a sustenance package for Pakistan's F-16 fleet.

"It's really for the United States today to reflect on the merits of this relationship and what they get by it," Jaishankar asserted. "For someone to say I am doing this because it is all counter-terrorism content and so when you are talking of an aircraft like a capability of an F-16 where everybody knows, you know where they are deployed and their use. You are not fooling anybody by saying these things," Jaishankar noted. "If I were to speak to an American policy-maker, I would really make the case (that) look what you are doing," Jaishankar strongly asserted.

Jaishankar on Saturday concluded the high-level United Nations General Assembly debate in New York and is scheduled to spend the next three days in Washington. The minister is scheduled to meet with his American counterpart Secretary of State Anthony Blinken and other top officials of the Biden administration.

<https://www.hindustantimes.com/world-news/youre-not-fooling-anybody-jaishankar-responds-to-us-f-16-package-for-pakistan-101664183691205.html>

US Responds to Jaishankar's Comment on F-16 Sales to Islamabad: 'We Look to India and Pakistan as Partners'

India and Pakistan are both partners of the US with different points of emphasis, the Biden administration said Monday, a day after visiting External Affairs Minister S Jaishankar questioned the rationale behind the latest American F-16 security assistance to Islamabad. Referring to the argument made by the US that F-16 sustenance package is to fight terrorism,

Jaishankar had said everybody knows where and against whom F-16 fighter jets are used. “You’re not fooling anybody by saying these things,” he said in response to a question during an interaction with Indian-Americans.

“We don’t view our relationship with Pakistan, and on the other hand, we don’t view our relationship with India as in relation to one another. These are both partners of ours with different points of emphasis in each,” State Department Spokesperson Ned Price told reporters at his daily news conference. “We look to both as partners, because we do have in many cases shared values. We do have in many cases shared interests. And the relationship we have with India stands on its own. The relationship we have with Pakistan stands on its own,” he said.

Early this month, the Biden administration approved a \$450 million F-16 fighter jet fleet sustainment programme to Pakistan, reversing the decision of the previous Trump administration to suspend military aid to Islamabad for providing safe havens for the Afghan Taliban and the Haqqani network. “We also want to do everything we can to see to it that these neighbours have relations with one another that are as constructive as can be possible. So that’s another point of emphasis,” Price said in response to a question. Responding to another question, Price said it is “not in Pakistan’s interest to see instability and violence in Afghanistan”.

“The support for the people of Afghanistan is something we discuss regularly with our Pakistani partners; our efforts to improve the lives and livelihoods and humanitarian conditions of the Afghan people, and to see to it that the Taliban live up to the commitments that they have made,” he added. Pakistan is implicated in many of these same commitments: the counterterrorism commitments, commitments to safe passage, commitments to the citizens of Afghanistan, Price said. “The unwillingness or the inability on the part of the Taliban to live up to these commitments would have significant implications for Pakistan as well”. “So, for that reason, we do share a number of interests with Pakistan regarding its neighbour,” Price said.

The United States, he noted, has been intently focused on the devastation that has resulted in the loss of life resulting from the torrential floods that have devastated large areas of Pakistan. “We have provided tens of millions of dollars in relief for these floods. The Secretary today will have additional details on further US assistance for the Pakistani people, in light of this humanitarian emergency that Pakistanis are facing,” he added.

<https://indianexpress.com/article/world/united-states-pakistan-relationship-india-jaishankar-comment-f16-8174908/>



Tue, 27 Sept 2022

US Carrier, S Korea Warships Launch Drills Amid North's Threat

A US aircraft carrier and its battle group launched drills with South Korean warships off the Korean Peninsula's east coast on Monday in their first such training in five years, a day after North Korea test-fired a short-range ballistic missile in a possible response to the exercise. North Korea could conduct more tests in coming days as it views US-South Korean military exercises as a practice to invade the county and often reacts with displays of weapons designed to attack its

rivals. The four days of drills are aimed at demonstrating the allies' "powerful resolve to respond to North Korean provocations" and improve their ability to perform joint naval operations, the South Korean navy said in a statement.

More than 20 US and South Korean navy ships, including the nuclear-powered aircraft carrier USS Ronald Reagan, a US cruiser and South Korean and US destroyers, were mobilised for the drills, according to the navy statement. It said US and South Korean fighter jets and helicopters will also take part in the training. It would be the first such joint drills involving a US aircraft carrier near the peninsula since 2017, when the US sent three aircraft carriers including the Reagan for naval drills with South Korea in response to North Korean nuclear and missile tests. The allies had since cancelled or downsized some of their regular drills to support now-dormant talks on North Korea's nuclear programme or guard against COVID-19.

The North Korean missile fired on Sunday flew about 600 kilometres at the maximum altitude of 60 kilometres before falling into the waters off the North's east coast, according to South Korean estimates. Some experts say North Korea might have launched a nuclear-capable, highly maneuverable ballistic missile and that its 600 kilometre-flight had enough range to strike a southeastern South Korean port where the Reagan was previously docked. North Korea has performed a record number of missile tests this year as it steadfastly rebuffs US and South Korean calls to resume the nuclear diplomacy.

North Korea has said it won't return to talks unless the United States drops its hostile policies in an apparent reference to US-South Korean military drills and US-led economic sanctions on it. Earlier this month, North Korea adopted a new law that authorised the preemptive use of nuclear weapons in some situations, a development that showed its increasingly aggressive nuclear doctrine. Some analysts say North Korea would eventually aim for arms control negotiations with the US to get sanctions relief and other concessions in return for a partial surrender of its nuclear capability.

<https://www.dailypioneer.com/2022/world/us-carrier--s-korea-warships-launch-drills-amid-north-s-threat.html>

Science & Technology News



Press Information Bureau
Government of India

Mon, 26 Sep 2022 5:45 PM

Union Minister Dr Jitendra Singh, who is also the Vice President of CSIR, announces "One Week One Lab" campaign to showcase the technological breakthroughs and innovations in each of the 37 CSIR laboratories/institutes spread across the country

The Minister addresses the first ever CSIR Leadership Meet attended by the Directors and Head of Departments of all the 37 CSIR labs across the country
Dr Jitendra Singh said, CSIR breakthroughs in areas like Drone, Heliborne technology, state of the art Sewage cleaning machines, Aroma Mission has opened up huge opportunities for developing meaningful and equal stake partnership among Research, Academia and Industry
CSIR with a pool of over 4,500 CSIR scientists must reorient and revitalise to emerge as Global Centres of Innovations in the Amrit Kaal: Dr Jitendra Singh

Union Minister of State (Independent Charge) Science & Technology; Minister of State (Independent Charge) Earth Sciences; MoS PMO, Personnel, Public Grievances, Pensions, Atomic Energy and Space, Dr Jitendra Singh, who is also the Vice President of CSIR (Council of Scientific & Industrial Research), today announced "One Week One Lab" theme-based campaign to showcase the technological breakthroughs and innovations in each of the 37 CSIR laboratories/institutes spread across the country. Addressing the first-ever CSIR Leadership Meet attended by the Directors and Head of Departments of all the 37 CSIR labs across the country, Dr Jitendra Singh said, the legacy of CSIR is built on the cumulative contribution of its several national laboratories and institutes. He said, each laboratory of CSIR is unique and specialising in as diverse areas as genomics to geology, material technology to microbial technology and food to fuel.

The Minister also recalled how the laboratories came together during the COVID pandemic last year and developed several technologies that helped India's fight against COVID. The Minister said, the success stories of each lab must be brought to the fore of the country through a massive mass media campaign. Dr Jitendra Singh said, CSIR breakthroughs in areas like Drone, Heliborne technology, state of the art Sewage cleaning machines, Aroma Mission has opened up huge opportunities for developing meaningful and equal stake partnership among Research, Academia and Industry. The Minister said, the state-of-the-art Heli-borne survey technology

with cooperation from Jal Shakti Ministry was applied last year in States of Rajasthan, Gujarat, Punjab and Haryana and this could play an important role in positively contributing to Prime Minister Narendra Modi's Vision and Mission of "Har Ghar Nal Se Jal". Similarly, the mechanized sewage cleaning system developed by CSIR for wider dissemination will help in achieving the target of Swachh Bharat Mission, he added.

Under Prime Minister Narendra Modi's leadership, said the Minister who is also Vice President CSIR, that Science & Technology has got enhanced budget and a very special impetus in the last 8 years and the scientific pursuits and endeavours are now being assigned special importance. He said, the ultimate goal of all Scientific Innovations is to bring "Ease of Living" for the common man. Dr Jitendra Singh called upon a pool of over 4,500 CSIR scientists to reorient and revitalise the organization to emerge as Global Centres of Innovations in the Amrit Kaal. He said, they must focus on emerging innovations in areas like Hydrogen in the energy transition, Carbon capture and storage, Accessible solar power, Plastic recycling and Cheap energy storage.

Dr Jitendra Singh said that there should be a Science Pavilion on the lines of DST and DBT at Pragati Maidan. He also urged the DG, CSIR to organize CSIR-Expos in various parts of the country to showcase its technological prowess to various states and industries, besides other stakeholders. In conclusion, Dr Jitendra Singh asked CSIR and all the science departments to explore S&T innovations needed in the next ten years to make India globally a frontline state in technological achievements and innovations. The Minister said, "We should not restrict our ambition to be the best in India but be the best in the world as India is blessed with the demographic dividend of youth and they can take up any challenge with the right training and motivation".

DG, CSIR, Dr N. Kalaiselvi said in her welcome address that 21st century is going to be the century of India and for India. She said, Science and Technology fraternity must rise to the occasion and work hard to make India a respected name in the global arena. CSIR will have a celebration of eight decades of its foundation soon with several commemorative activities and prizes to be announced.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1862285>



Mon, 26 Sep 2022

India's Home-Grown Alternative to the GPS Navigation System

The Indian government is pushing smartphone makers to enable support for its NavIC navigation system in new devices sold in the country from next year, a move that has spooked the industry due to additional costs and tight time frame. Below are the details of NavIC's inception, why India wants smartphone makers to adopt it and how the system compares to other global or regional navigation systems.

What is NavIC?

NavIC, or Navigation with Indian Constellation, is an independent stand-alone navigation satellite system developed by the Indian Space Research Organisation (ISRO). NavIC was originally approved in 2006 at a cost of \$174 million. It was expected to be completed by late 2011, but only became operational in 2018. NavIC consists of eight satellites and covers the whole of India's landmass and up to 1,500 km (930 miles) from its boundaries. Currently, NavIC's use is limited. It is being used in public vehicle tracking in India, for providing emergency warning alerts to fishermen venturing into the deep sea where there is no terrestrial network connectivity, and for tracking and providing information related to natural disasters. Enabling it in smartphones is the next step India is pushing for.

How does NavIC compare?

The main difference is the serviceable area covered by these systems. GPS caters to users across the globe and its satellites circle the earth twice a day, while NavIC is currently for use in India and adjacent areas. Like GPS, there are three more navigation systems that have global coverage – Galileo from the European Union, Russia-owned GLONASS and China's Beidou. QZSS, operated by Japan, is another regional navigation system covering Asia-Oceania region, with a focus on Japan. India's 2021 satellite navigation draft policy stated the government will work towards "expanding the coverage from regional to global" to ensure availability of NavIC signal in any part of the world. NavIC is "as good as GPS of the United States in terms of position accuracy," the Indian government said in August.

Why is india promoting NavIC?

India says NavIC is conceived with the aim of removing dependence on foreign satellite systems for navigation service requirements, particularly for "strategic sectors." Relying on systems like GPS and GLONASS may not always be reliable, India says, as those are operated by the defence agencies of respective nations and it is possible that civilian services can be degraded or denied. "NavIC is an indigenous positioning system that is under Indian control. There is no risk of the service being withdrawn or denied in a given situation," the government said in 2021. India also wants to encourage its ministries to use NavIC applications to promote local industry engaged in developing indigenous NavIC-based solutions.

<https://www.financialexpress.com/defence/indias-home-grown-alternative-to-the-gps-navigation-system/2691198/lite/>



Mon, 26 Sep 2022

HAL All Set to Boost Cryogenic Engine Production to Further India's Space Exploration Programmes

As Space exploration is mostly dependent upon cryogenic technology, the Aerospace Division of state owned Hindustan Aeronautics (HAL) has entered into manufacture of Cryogenic Engines. This will help in boosting India's space exploration programmes as it will not be dependent on

foreign companies for this critical technology. This is a major step in technology up-gradation cum modernization of the division. In her first official visit to any state, on Tuesday (September 27, 2022) the President of India Droupadi Murmu will inaugurate 'Integrated Cryogenic Engines Manufacturing Facility' (ICMF) in Bengaluru. The 4500 sq meter facility is expected to cater to the entire cryogenic rocket engine manufacturing requirements of the Indian Space Research Organisation (ISRO). This facility has been set up with an investment of Rs 208 crores. By March 2023, according to HAL officials, the module engines will be realised.

According to officials, this division is already in manufacturing liquid propellant tanks and launch vehicle structures of GSLV MK-II, GSLV MK-III, PSLV, and is also into stage integration for GSLV MK-II.

More about the new facility

Under one roof there will be 70 high-tech equipment and testing apparatus. These will be used for manufacturing CE20 Cryogenic Engines and also SE2000 Cryogenic engines for Indian rockets. While the SCE-2000 semi-cryogenic engine is meant to be used in the SC-120 rocket stage which is in the process of being developed, the CE20 engines are meant for the final stage of the GSLV Mk3 rocket.

More about Cryogenic Engines

Only a few countries including Russia, the US, France, Japan and China have already mastered Cryogenic Technology. Cryogenic engines are used in space launch vehicles globally. Such an engine uses a cryogenic fuel or oxidizer (or both) liquefied. This, according to HAL officials, is stored at very low temperatures. And this is already being used by ISRO for its heavy light rockets. According to HAL these Cryogenic engines use liquid oxygen (stored at -183deg Centigrade) as an oxidizer. Liquid hydrogen (stored at -253 deg Centigrade) is used as fuel.

Background

India's indigenously developed and designed High thrust Cryogenic Rocket Engine which can generate a nominal thrust of 19 tonnes in 2015. At ISRO's Propulsion Complex in Mahendragiri this was successfully endurance tested for duration of 800 seconds back in 2015 and this is being used for powering the Cryogenic stage (C25) which is the upper stage of GSLV MK-III launch vehicle. This launch vehicle has the capability of launching four tonne class satellites.

<https://www.financialexpress.com/defence/hal-all-set-to-boost-cryogenic-engine-production-to-further-indias-space-exploration-programmes/2691741/>

MIT Engineers Build Wireless Underwater Camera that Doesn't Need Batteries!

More than 95 percent of Earth's oceans have never been observed, according to estimates by scientists, which means we have seen less of our planet's ocean than we have the far side of the moon or the surface of Mars. One steep challenge preventing widespread undersea exploration is the high cost of powering an underwater camera for a long time. Doing so now requires tethering it to a research vessel or frequently sending a ship to recharge its batteries. MIT engineers have taken a major step to overcome this problem by developing an ultra-efficient battery-free, wireless underwater camera. In fact, it is about 100,000 times more energy-efficient than other undersea cameras. Even in dark underwater environments, the device can take color photos and transmit image data wirelessly through the water.

What makes this autonomous camera especially unique is that it is powered by sound. It converts mechanical energy from sound waves traveling through water into electrical energy that powers its imaging and communications equipment. After capturing and encoding image data, the camera also uses sound waves to transmit data to a receiver that can reconstruct the image. Because it doesn't require a power source, the camera could run for weeks on end before retrieval. This would enable scientists to search remote parts of the ocean for new species. It could also be used to capture images of ocean pollution or monitor the health and growth of fish raised in aquaculture farms.



A battery-free, wireless underwater camera developed at MIT could have many uses, including climate modeling.

“One of the most exciting applications of this camera for me personally is in the context of climate monitoring. We are building climate models, but we are missing data from over 95 percent of the ocean. This technology could help us build more accurate climate models and better understand how climate change impacts the underwater world,” says Fadel Adib, senior author of a new paper on the system. He is an associate professor in the Department of Electrical Engineering and Computer Science and director of the Signal Kinetics group in the MIT Media

Lab. Joining Adib on the paper are co-lead authors and Signal Kinetics group research assistants Sayed Saad Afzal, Waleed Akbar, and Osvy Rodriguez, as well as research scientist Unsoo Ha, and former group researchers Mario Doumet and Reza Ghaffarivardavagh. The paper is published today (September 26, 2022) in the journal Nature Communications.

Going battery-free

To build a camera that could operate autonomously for long periods, the scientists needed a device that could harvest energy underwater on its own while consuming very little power. Transducers made from piezoelectric materials are placed around the camera's exterior and are used to acquire energy. Piezoelectric materials produce an electric signal when a mechanical force is applied to them. When a sound wave traveling through the water hits the transducers, they vibrate and that mechanical energy is converted into electrical energy. Those sound waves could come from any source, like a passing ship or marine life. The camera stores harvested energy until it has built up enough to power the electronics that take photos and communicate data.

To keep power consumption as low as possible, the engineers used off-the-shelf, ultra-low-power imaging sensors. However, these sensors only capture grayscale images. And since most underwater environments lack a light source, they needed to develop a low-power flash, too. "We were trying to minimize the hardware as much as possible, and that creates new constraints on how to build the system, send information, and perform image reconstruction. It took a fair amount of creativity to figure out how to do this," Adib says. They solved both problems simultaneously using red, green, and blue LEDs. When the camera captures an image, it shines a red LED and then uses image sensors to take the photo. It repeats the same process with green and blue LEDs.

Even though the image looks black and white, the red, green, and blue colored light is reflected in the white part of each photo, Akbar explains. When the image data are combined in post-processing, the color image can be reconstructed from the three source images. "When we were kids in art class, we were taught that we could make all colors using three basic colors. The same rules follow for color images we see on our computers. We just need red, green, and blue — these three channels — to construct color images," he says.

Sending data with sound

Once image data are captured, they are encoded as bits (1s and 0s) and sent to a receiver one bit at a time using a process called underwater backscatter. The receiver transmits sound waves through the water to the camera, which acts as a mirror to reflect those waves. The camera either reflects a wave back to the receiver or changes its mirror to an absorber so that it does not reflect back. A hydrophone next to the transmitter senses if a signal is reflected back from the camera. If it receives a signal, that is a bit-1, and if there is no signal, that is a bit-0. The system uses this binary information to reconstruct and post-process the image.

"This whole process, since it just requires a single switch to convert the device from a non-reflective state to a reflective state, consumes five orders of magnitude less power than typical underwater communications systems," Afzal says. The camera was tested in several underwater environments by the researchers. In one, they captured color images of plastic bottles floating in a New Hampshire pond. They were also able to take such high-quality photos of an African starfish that tiny tubercles along its arms were clearly visible. The device was also effective at

repeatedly imaging the underwater plant *Aponogeton ulvaceus* over the course of a week in a dark environment to monitor its growth. Now that they have demonstrated a working prototype, the engineers plan to enhance the device so it is practical for deployment in real-world settings. They want to increase the camera's memory so it could capture photos in real-time, stream images, or even shoot underwater video.

Another goal is to extend the camera's range. They successfully transmitted data 40 meters (130 feet) from the receiver, but pushing that range wider would enable the camera to be used in more underwater settings. "This will open up great opportunities for research both in low-power IoT devices as well as underwater monitoring and research," says Haitham Al-Hassanieh. He is an assistant professor of electrical and computer engineering at the University of Illinois Urbana-Champaign, who was not involved with this research.

<https://scitechdaily.com/mit-engineers-build-wireless-underwater-camera-that-doesnt-need-batteries/amp/>

THE TIMES OF INDIA

Tue, 27 Sept 2022

Govt to Phase Out 100 Awards, Several Fellowships in Science

September 26 is marked on every scientist's calendar. It is when the Shanti Swarup Bhatnagar awards, India's highest recognition for scientific achievement, are declared. This year, the day went by without any announcement. Instead, the government issued a notification which said that about 100 awards and several fellowships in the field of science, were being discontinued. All private endowment awards too have been cancelled. Instead, most departments will now have only one award of a "high stature" instituted, said the order.

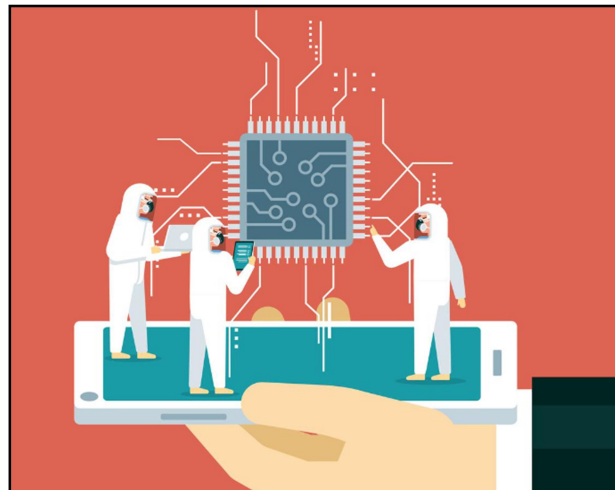
Currently, government departments like earth sciences, biotechnology, space, atomic energy, etc, have separate prizes to recognise talent. In all, there are 207 such awards, of which 4 are national awards, 97 private endowments awards, 54 are lecture/scholarship/fellowship-based awards and 56 are internal awards. As per the notification, "All private endowments awards may be discontinued. All lecture/scholarship/fellowship based awards may be discontinued.

The internal awards may be discontinued and wherever required, these awards may be merged in the proposed schemes for scholarship/fellowship mentioned above." Despite the shake-up, the Shanti Swarup Bhatnagar award that celebrates excellence in scientific research will be continued, but some say it too is being watered down. The notification says, "As regards the monthly remuneration given under Shanti Swarup Bhatnagar award, a proposal for giving a lump sum amount in place of monthly remuneration was considered but no final decision was taken. It was also agreed that the duration of the monthly remuneration may be capped at 15 years." The award, given since 1958, includes a sum of Rs 5 lakh and a monthly allowance of Rs 15,000 till the researcher is working.

<https://timesofindia.indiatimes.com/india/govt-to-phase-out-100-awards-several-fellowships-in-science/articleshow/94466088.cms>

A Push for the Semiconductor Industry

The story so far: In a bid to make India's \$10 billion chip-making initiative more attractive to investors, the Centre on September 21, approved changes to the scheme for the development of a semiconductor and display manufacturing ecosystem in the country.



Semiconductors are the thumbnail-sized building blocks of almost every modern electronic device from smartphones to connected devices in the Internet of Things

How big is the industry?

Semiconductors are the thumbnail-sized building blocks of almost every modern electronic device from smartphones to connected devices in the Internet of Things (IoT). They help give computational power to devices. The global semiconductor industry is currently valued at \$500-\$600 billion and caters to the global electronics industry currently valued at about \$3 trillion. The basic component of a semiconductor chip is a sliver of silicon, which is etched with billions of microscopic transistors and projected to specific minerals and gases, forming patterns to control the flow of current while following different computational instructions. The most-advanced semiconductor, developed in 2020 is known as the 5nm, having 16 billion transistors. Semiconductors having higher nanometre value are applied in automobiles, consumer electronics and so on, while those with lower values are used in devices such as smartphones and laptops.

The chip-making process is complex and highly exact, having multiple other steps in the supply chain such as chip-designing done by companies to develop new circuitry for use in appliances, designing software for chips and patenting them through core Intellectual Property (IP) rights. It also involves making chip-fabrication machines; setting up fabs or factories; and ATMP (assembly, testing, marking and packaging). The chip-making industry is a highly-concentrated one, with the big players being Taiwan, South Korea and the U.S. among others. In fact, according to a New York Times estimate, 90% of 5nm (nanometre) chips are mass-produced in Taiwan, by the Taiwan Semiconductor Manufacturing Company (TSMC). Therefore, the global chip shortage, U.S.-China tensions over Taiwan, and the supply chain blockages owing to the

Russia-Ukraine conflict have led major economies to enter the chip-making sector with a renewed push. For example, the U.S. announcement of \$52.7 billion in government funding for the CHIPS and Science Act and the EU's Chips Act that will mobilise €43 billion for public and private investments.

What are the changes to India's chip-making scheme?

In December 2021, India announced its roughly \$10 billion dollar production-linked incentive (PLI) scheme to encourage semiconductor and display manufacturing in the country. It also announced fiscal support for a design-linked initiative (DLI) scheme to drive global and domestic investment related to design software, IP rights etc. According to the Electronics and IT Ministry, semiconductor demand in India would increase to \$70-\$80 billion by 2026 with the growing demand for digital devices and electronic products. The new changes announced last Wednesday seek to harmonise government incentives for all technology nodes of semiconductors, according to the Minister of State for Electronics and IT Rajeev Chandrasekhar. In the previous version of the scheme, the Centre was offering to fund 30% of the project cost for 45nm to 65nm chip production, 40% for 28nm to 45nm, and 50% or half of the funding for chips 28nm or below. The modified scheme provides uniform 50% fiscal support for all nodes. Besides, it will provide 50% of capital expenditure for other steps of the process as well (chip design and ATMP).

Mr. Chandrasekhar explained the new scheme was brought in after months of discussions with industry stakeholders and potential investors, so that all areas of chip-making are encouraged to create an integrated ecosystem in India, rather than manufacturing here and having to package and test chips elsewhere. The government said that the PLI and DLI schemes had attracted many global semiconductor players for setting up fabs in India and the modified programme would expedite these investments and bring in more applicants. So far, Vedanta and Taiwanese chipmaker Foxconn have signed an MoU to set up a ₹1,54,000 crore semiconductor plant in Gujarat. Two other projects have also been announced — a \$3 billion plant in Karnataka by the International consortium ISMC (a joint venture between Abu Dhabi-based Next Orbit Ventures and Israel's Tower Semiconductor) and a \$3.5 billion plant in Tamil Nadu by Singapore's IGSS Ventures. The modified scheme also emphasised the production of the 45nm chip, which is fairly less time-consuming and economical in terms of production. The government said that these chips had high demand, driven primarily by automotive, power and telecom applications.

What are the challenges?

While the scheme is an encouraging move, chip production is a resource-intensive and expensive process. While the new scheme provides equal funding for all steps of the process, the outlay of the scheme remains \$10 billion. Notably, just the setting up of one semiconductor fab requires an investment of anywhere between \$3 and \$7 billion. Analysts, while positive, are concerned that not much of the current scheme outlay would be left to support other elements including display fabs, packaging and testing facilities, and chip design centres. They also argue that the initial funding should focus on areas like design and R&D, for which India already has an established talent pool.

According to a Financial Times analysis, while India focuses on "lagging-edge" technology nodes in the start to supply to the automotive and appliance sector, creating global demand may be difficult as giants like Taiwan offer viable cutting-edge chip-tech worldwide. Thus, attracting global players to set up here would be beneficial as they come with their customer base. Chip-

making also requires gallons of ultrapure water in a single day, which experts say, could be a task for the government to provide to factories, compounded also by the drought conditions which often prevail in large parts of the country. Besides, an uninterrupted supply of power is central to the process, with just seconds of fluctuations or spikes causing millions in losses. Another task for the government is to drive up consumer demand in the semiconductor industry to not end up in a situation where these ventures remain successful only till taxpayers are forced to fund required subsidies.

<https://www.thehindu.com/sci-tech/technology/explained-a-push-for-the-semiconductor-industry/article65939231.ece>

