

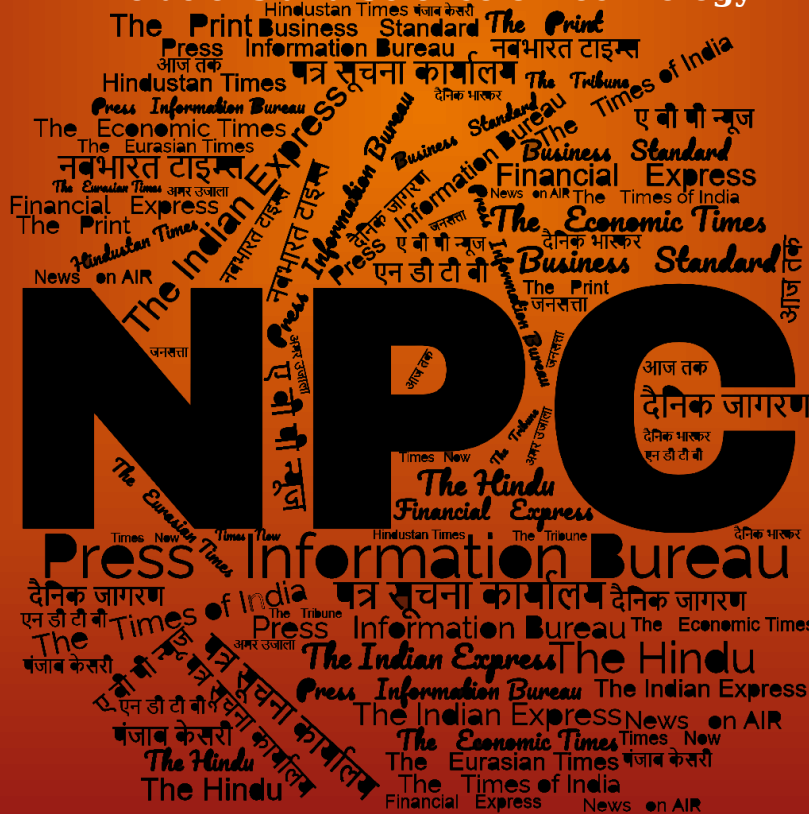
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समाचार पत्रों से चयित अंश Newspapers Clippings

डीआरडीओ समुदाय को डीआरडीओ प्रौद्योगिकियों, रक्षा प्रौद्योगिकियों, रक्षा नीतियों, अंतर्राष्ट्रीय संबंधों और विज्ञान एवं प्रौद्योगिकी की नूतन जानकारी से अवगत कराने हेतु दैनिक सेवा

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Tue, 09 Jan 2024

DRDO ने लॉन्च की स्वदेशी असॉल्ट राइफल उग्रम:500 मीटर तक निशाना साध सकती है, 4 किलोग्राम से कम वजन

रक्षा अनुसंधान और विकास संगठन (DRDO) ने एक प्राइवेट कंपनी के साथ मिलकर 7.62 x 51 मिमी कैलिबर की एक अत्याधुनिक, स्वदेशी असॉल्ट राइफल 'उग्रम' (Ugram) लॉन्च की है। DRDO ने इस राइफल को डिजाइन, डेवलप किया है।

इस राइफल को सशस्त्र बलों, अर्धसैनिक बलों और राज्य पुलिस ऑपरेशनल जरूरतों के हिसाब से डिजाइन किया गया है। पुणे में DRDO के आर्मेन्ट और कॉम्बैट इंजीनियरिंग सिस्टम के डायरेक्टर जनरल डॉ. शैलेन्द्र वी गाडे ने इस राइफल का अनावरण किया।

पुणे स्थित DRDO की लेबोरेटरी आर्मेन्ट रिसर्च एंड डेवलपमेंट इस्टेब्लिशमेंट (ARDE) ने हैदराबाद की डीवीपा आर्मेन्ट इंडिया प्राइवेट लिमिटेड के साथ मिलकर राइफल बनाई है। राइफल के बैरल बनाने की यूनिट ARDE में ही लगाई गई है। रूस-यूक्रेन युद्ध के कारण देश में AK-203 राइफल की सप्लाई प्रभावित हुई है। इसे देखते हुए उग्रम बनाई गई है।

दिसंबर में रक्षा अधिग्रहण परिषद ने आर्म्ड फोर्स के लिए इसी कैलिबर की 70 हजार यूएस-निर्मित एसआईजी साँवर असॉल्ट राइफल की खरीद के लिए मंजूरी दी थी।

उग्रम राइफल की विशेषताएं

- राइफल की रेंज 500 मीटर है।
- इसका वजन चार किलोग्राम से कम है।
- राइफल में 20 राउंड मैगजीन लोड की जा सकती हैं।
- सभी जरूरी कंपोनेंट स्टील के बने हैं।
- यह सिंगल और फुली ऑटोमैटिक दोनों मोड में फायर कर सकती है।
- इसे भारतीय सेना के जनरल स्टाफ क्वालिटेटिव रिक्वायरमेंट्स (GSQR) के आधार पर डिजाइन किया गया है।

'उग्रम' राइफल की तुलना लेटेस्ट AK और AR टाइप राइफलों से हो सकती है। इसका डिजाइन रिवेट-फ्री है जो इसे और मजबूत बनाता है। 2020 में ऐसी 72,000 से ज्यादा राइफलें पहले ही खरीदी जा चुकी हैं। DRDO की 'उग्रम' राइफल को अभी कई इंटरनल टेस्ट और ट्रायल से गुजरना होगा। उसके बाद ही इसे सेना में शामिल करने पर विचार किया जाएगा

100 दिनों में बनाई-राजू

ARDE के निदेशक अंकथी राजू ने कहा, “यह दो साल पहले शुरू किया गया एक मिशन मोड प्रोजेक्ट था। राइफल डिजाइन करने के बाद हमने विकास और निर्माण के लिए एक निजी उद्योग भागीदार की तलाश शुरू कर दी। इसके साथ ही हमने अपनी जानकारी के जरिए इसके हार्डवेयर पर काम करना शुरू कर दिया। राइफल को 100 दिनों के भीतर निर्मित किया गया।” अंकथी राजू ने बताया कि अब अलग-अलग लेवल पर इस राइफल की टेस्टिंग होगी। इस राइफल की सटीकता और स्थिरता की जांच की जाएगी। राइफल की टेस्टिंग ऊंची, रेगिस्तानी इलाकों आदि सहित विभिन्न मौसम और भौगोलिक परिस्थितियों में किया जाएगा।

<https://www.bhaskar.com/national/news/drdo-launches-indigenous-assault-rifle-ugram-for-armed-forces-132417865.html>



Tue, 09 Jan 2024

DRDO New Rifle: PAK- चीन हो जाएं अलर्ट, भारतीय सेना को मिलने जा रही है ये बेहद खतरनाक राइफल, आधा किमी दूर से उड़ा देगी परखच्चे

हथियारों के मामले में आत्मनिर्भर बन रहे भारत ने मंगलवार को एक और बड़ी उपलब्धि हासिल की. रक्षा अनुसंधान और विकास संगठन (DRDO) ने 'उग्राम' (Ugram) नाम से एक स्वदेशी असॉल्ट राइफल लॉन्च की है. इस देसी राइफल को बनाने का मकसद सशस्त्र बलों, अर्धसैनिक और राज्य पुलिस इकाइयों की ऑपरेशनल जरूरतों को पूरा करना है. 7.62 x 51 मिमी कैलिबर वाली राइफल को एक निजी उद्योग भागीदार के सहयोग से डिजाइन, विकसित और निर्मित किया गया है.

आधा किमी दूर तक उड़ा देगी धज़ियां

रिपोर्ट के मुताबिक इस देसी राइफल के पहले ऑपरेशनल प्रोटोटाइप को पुणे में DRDO के आमर्मेंट एंड कॉम्बैट इंजीनियरिंग सिस्टम्स में लॉन्च किया गया. इसकी मारक क्षमता 500 मीटर है और इसका वजन चार किलोग्राम से कम है.

प्राइवेट सेक्टर के सहयोग से तैयार हुई राइफल

आमर्मेंट रिसर्च एंड डेवलपमेंट एस्टैब्लिशमेंट (ARDE) ने बयान जारी करके कहा, 'आमर्मेंट रिसर्च एंड डेवलपमेंट एस्टैब्लिशमेंट (एआरडीई) ने प्राइवेट सेक्टर के सहयोग से 7.62x51 मिमी असॉल्ट राइफल यूजीआरएएम विकसित की है. इस राइफल को ARDE के महानिदेशक डॉ. एसवी गाडे ने लॉन्च किया.'

अब कई महीनों तक चलेगा ट्रायल

DRDO अधिकारियों के मुताबिक 4 किलोग्राम से कम वजन की यह राइफल सेना की खास जरूरतों को पूरा करने के लिए डिज़ाइन की गई है. राइफल को हर मौसम और इलाके में प्रभावी बनाने के लिए स्टील का इस्तेमाल किया गया है. प्रोटोटाइप राइफल की लॉन्चिंग के वक्त आर्मी और गृह मंत्रालय के वरिष्ठ अधिकारी संस्थान में मौजूद थे. अब इस राइफल का उत्पादन शुरू करने से पहले उसे उसका ट्रायल करने के लिए एक स्वतंत्र विशेषज्ञ समिति को सौंपा जाएगा

पुणे बनेगा छोटे हथियारों का हब

DRDO अधिकारियों के मुताबिक देश में छोटे हथियारों के उत्पादन को बढ़ावा देने के लिए पुणे में स्टेट ऑफ द आर्ट उत्पादन केंद्र शुरू किया है. जहां पर छोटे बैरल के हथियार बनाए जा रहे हैं. इन सुविधाओं को प्राइवेट फर्म के

साथ भी शेयर किया जा रहा है. महानिदेशक ने बताया कि यह सेंटर भविष्य में डीआरडीओ की ओर से बनाए जाने वाले छोटे हथियारों के डिजाइन, डेवलपमेंट और उत्पादन का हब बनेगा.

शिद्धत से महसूस की जा रही थी जरूरत

बताते चलें कि भारत की तीनों सेनाओं और अर्ध सैनिक बलों में एके-47 राइफल बड़े पैमाने पर यूज की जाती है. यह रूस में बनी हुई राइफल है, जिसकी मारक क्षमता 300 मीटर है. इसकी जबरदस्त मारक क्षमता की वजह से भारत समेत कई देशों की सेनाएं इसे यूज कर रही हैं. उग्राम से पहले भारत ने इनसास नाम की राइफल बनाई थी. लेकिन उसके बारे में शिकायत रही है कि लगातार फायरिंग के बाद उसकी बैरल गरम हो जाती है. जिसके बाद उसे रिप्लेस नई राइफल बनाने की जरूरत शिद्धत से महसूस की जा रही थी.

<https://zeenews.india.com/hindi/india/drdo-launches-new-assault-rifle-ugram-know-its-features/2051925>



Tue, 09 Jan 2024

'Single and Auto Mode, 500-Meter Firing Range': Ugram Assault Rifle Launched by DRDO | Salient Features

In a major boost to the 'Make in India' initiative, the Defence Research and Development Organisation (DRDO) on Monday launched Ugram rifles. Ugram is a state-of-art rifle of the 7.62 x 51 mm calibre. The rifle is developed by the Armament Research and Development Establishment (ARDE), a DRDO's laboratory and a Hyderabad-based private firm. The weapon is designed to meet the operational requirements of the Indian armed forces.

Features Of Ugram Rifle:

- Ugram is a state-of-the-art assault rifle of the 7.62 x 51 mm calibre.
- It is indigenously designed, developed and manufactured by the DRDO in collaboration with a private firm.
- It reportedly has an effective range of 500 metres.
- It weighs less than four kilograms.
- The rifle has a 20-round magazine. It can in both single and full auto mode.
- Its configuration is based on latest AK and AR type rifles/carbines.

The rifle was unveiled at a time when the Defence Acquisition Council (DAC) in December gave a nod for procurement of 70,000 US-made SIG Sauer assault rifles. These rifled reportedly are of the same calibre as that of Ugram.

As per A Raju, the director of the ARDE, the newly introduced concept of development cum production partner (DCPP) was followed to execute the Ugram project. "In this case, we have followed the newly introduced concept of development cum production partner (DCPP) to execute the project and that is how the private firm is involved in it. Now, we have developed the weapon in collaboration. We will now conduct various internal trials at our firing range to test various aspects of the weapon before going for user trials," Raju said as quoted by TOI.

Notably, Ugram will undergo several internal tests before induction.

<https://www.timesnownews.com/india/how-ugram-assault-rifle-launched-by-drdo-can-be-a-game-changer-salient-features-article-106671382>



Press Information Bureau
Government of India

Ministry of Defence

Tue, 09 Jan 2024

INS Kabra Arrives at Colombo, Sri Lanka

Indian Navy's Fast Attack Craft INS Kabra arrived at Colombo, Sri Lanka on 08 Jan 24. The ship was accorded a warm welcome by the Sri Lanka Navy. During the port call, Commanding Officer, INS Kabra called on Commander, Western Naval Area, Rear Admiral TSK Perera.

In a presentation ceremony, essential spares and stores meant for the Sri Lanka Navy and Air Force were handed over by the ship. The visit further strengthens the bilateral cooperation and camaraderie between the two Navies in keeping with the Prime Minister's vision of SAGAR.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1994404>



Press Information Bureau
Government of India

Ministry of Defence

Tue, 09 Jan 2024

Raksha Mantri Shri Rajnath Singh Holds Talks with UK Defence Minister Mr Grant Shapps in London; Emphasis on Enhancing Defence Industrial Cooperation

India & UK sign MoU for bilateral international cadet exchange programme; Letter of Arrangement inked on defence collaboration in R&D

Raksha Mantri Shri Rajnath Singh held a bilateral meeting with UK Defence Minister Mr Grant Shapps in London on January 09, 2024. The meeting was very warm with a fruitful exchange of ideas on both sides. Both Ministers discussed a range of defence, security and cooperation matters with particular emphasis on enhancing defence industrial collaboration. Mr Grant Shapps stressed that the relationship between UK and India is not transactional, instead both countries are natural partners with many commonalities and shared goals. The Raksha Mantri noted with appreciation the growing strategic convergence between the two countries, particularly in the Indo-Pacific.

The bilateral defence meeting was followed by the signing of two agreements between India and UK - an MoU on conduct of bilateral international cadet exchange programme, and a Letter of Arrangement between Defence Research and Development Organisation (DRDO) and UK's Defence Science and Technology Laboratory (DSTL) on defence collaboration in research and development. These documents will provide impetus to the people-to-people exchanges particularly among the youth, and larger area of defence research collaboration between the two countries.

After arriving in London late on 8th January, the Raksha Mantri began his London engagements by paying floral tributes to Father of the Nation Mahatma Gandhi at his statue at Tavistock Square earlier today. Mahatma Gandhi had studied law at the nearby University College London from 1888 to 1891. 9th January is a symbolic date from the perspective of Mahatma Gandhi's return from South Africa to Mumbai in 1915, which is commemorated in the form of Pravasi Bharatiya Divas in India, marking the rich contribution of the Overseas Indian community towards the development of the country.

Shri Rajnath Singh was presented a ceremonial Guard of Honour at the Horse Guards Parade Ground before the bilateral meeting with his UK counterpart.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1994638>

Business Standard

Tue, 09 Jan 2024

IAS Samir Kumar Sinha Takes over as DG (Acquisition) in Defence Ministry

Senior IAS officer Samir Kumar Sinha has been appointed as Additional Secretary and Director General (Acquisition) in the Defence Ministry, as part of a bureaucratic reshuffle effected by the Centre. Sinha, a 1994-batch Indian Administrative Service (IAS) officer, is currently working in his Assam-Meghalaya cadre.

The Appointments Committee of the Cabinet has approved his appointment as Additional Secretary and Director General (Acquisition), Department of Defence, a Union Personnel Ministry order said. Bharat Harbanslal Khera, a 1995-batch IAS officer of the Himachal Pradesh cadre, has been appointed as Additional Secretary in the Ministry of Consumer Affairs, Food and Public Distribution. Chandra Bhushan Kumar will be Additional Secretary as well as Mission Director for the Department of Drinking Water and Sanitation's Jal Jeevan Mission.

Puja Singh Mandol, currently Joint Director General in the Directorate General of Civil Aviation, has been appointed as Additional Secretary in the Ministry of Statistics and Programme Implementation, the order said.

Sanjeev Kumar Jindal, at present a Joint Secretary in the Home Ministry, will now be Additional Secretary.

Asit Gopal, Commissioner of Eklavya Model Residential School of tge National Educational Society for Tribal Students under the Ministry of Tribal Affairs, has been named as Additional Secretary and Financial Advisor in the Ministry of Textiles. Senior bureaucrat Tripti Gurha will be Additional Secretary in the Ministry of Women and Child Development.

https://www.business-standard.com/india-news/ias-samir-kumar-sinha-takes-over-as-dg-acquisition-in-defence-ministry-124010900236_1.html

अमरउजाला

Tue, 09 Jan 2024

HAL: गुजरात ग्लोबल ट्रेड शो 2024 में शामिल हुआ एचएएल, आत्मनिर्भर भारत की क्षमता का प्रदर्शन करेगी कंपनी

हिंदुस्तान एयरोनॉटिक्स लिमिटेड (एचएएल) ने 'आत्मनिर्भर भारत' पर जोर देते हुए 'वाइब्रेंट गुजरात ग्लोबल ट्रेड शो 2024' के 10 वें संस्करण में भाग लिया। सरकार के स्वामित्व वाली रक्षा सामग्री निर्माता कंपनी इस आयोजन के माध्यम से अपनी क्षमता का प्रदर्शन करना चाहती है। ट्रेड शो के दौरान एचएएल के सीएमडी (अतिरिक्त प्रभार) सीबी अनंतकृष्णन ने कहा, "हमें पूरा विश्वास है कि यह उन उत्पादों को प्रदर्शित करने का एक अवसर है, जिन्हें हम स्वदेशी रूप से डिजाइन और विकसित कर रहे हैं। उन्होंने कहा, चूंकि कई देश इस आयोजन में भाग लेंगे इसलिए एचएएल यहां वैश्विक एयरोस्पेस उद्योग को दिखाएगा कि हमारी क्षमताएं क्या हैं?"

अनंतकृष्णन ने कहा, "हमें इस बात पर भी गर्व है कि आत्मनिर्भर भारत के तहत, जो उत्पाद अब सामने आए हैं, वे काफी अच्छे हैं। हमारे उत्पादों को आने वाले समय में वैश्विक एयरोस्पेस उद्योग में पहचान मिलेगी। इस तरह से इस वाइब्रेंट गुजरात में भाग लेना एचएएल के लिए एक बड़ा अवसर होने जा रहा है।"

उन्होंने कहा, "मैं कह सकता हूं कि आत्मनिर्भरता के कारण आज भारतीय उत्पादों के डिजाइन और विकसित उत्पादों में बहुत प्रगति हुई है। इसकी पहल माननीय प्रधानमंत्री ने की है। एचएएल की ओर से डिजाइन किए गए उत्पाद, विशेष रूप से तेजस विमान काफी अच्छे हैं। इसने वैश्विक स्तर पर लोगों में रुचि पैदा की है।" उन्होंने कहा कि इसे हम बहुत भाग्यशाली मानते हैं कि माननीय प्रधानमंत्री ने खुद इस विमान में उड़ान भरी।

उनका मानना है कि जहां तक एयरोस्पेस और रक्षा उद्योग का सवाल है, भारत अगले पांच वर्षों में पूरी तरह से आत्मनिर्भर हो जाएगा। एचएएल स्टॉल पर प्रमुख आकर्षणों में से एक सुखोई-30 एमकेआई विमान होगा जिसे भारत में निर्मित हवा से जमीन पर मार करने वाली ब्रह्मोस मिसाइलों के साथ जोड़कर स्वदेशी रूप से संशोधित किया गया है। इस मिसाइल का वजन 2500 किलोग्राम है और इसकी मारक क्षमता करीब 300 किलोमीटर है। एचएएल ने स्वदेशीकरण के लिए 100 से अधिक महत्वपूर्ण उत्पादों का चयन किया है और उनमें से कुछ को शो के दौरान प्रदर्शित किया जाएगा।

<https://www.amarujala.com/business/business-diary/defence-manufacturer-hindustan-aeronautics-showcases-its-product-line-at-vibrant-gujarat-2024-01-09>



Wed, 10 Jan 2024

USISPF Strengthens Economic Bonds: Partnering with Vibrant Gujarat Global Summit 2024

The US-India Strategic Partnership Forum (USISPF) has announced its collaboration as a partner organization with the Vibrant Gujarat Global Summit 2024, scheduled to take place from January 10th to 12th in Gandhinagar.

This partnership underscores USISPF's commitment to fostering stronger economic ties and meaningful collaborations, as it leads a delegation comprising more than 35 prominent American

companies, including Salesforce, Abbott, Blackstone, HSBC, UPS, Micron, Cisco, and others. These companies are not only showcasing their commitment to Gujarat but also expressing plans to amplify their investments in the region.

The delegation, spearheaded by Lal Karsanbhai, President and CEO of Emerson, and co-led by USISPF President & CEO Dr. Mukesh Aghi, aims to explore opportunities in Gujarat's economic landscape, particularly in high-tech manufacturing, energy transition, chemicals, industrial manufacturing, aerospace, and defence.

During the summit, USISPF will host two panel discussions on January 11, covering the themes of accelerating the startup ecosystem and exploring opportunities in manufacturing and global value chains. Dr Mukesh Aghi expressed delight in contributing to Gujarat's development, praising the state's entrepreneurial spirit. Mr. Lal Karsanbhai, President and CEO of Emerson, emphasized the collaborative opportunities between the United States and Gujarat.

USISPF held a leadership reception on January 9, celebrating the US-Gujarat partnership, engaging with senior ministers and bureaucrats from both the Government of Gujarat and the Government of India.

The participation of American companies is seen as a way to strengthen economic cooperation with Gujarat, further enhancing the US-India strategic partnership. USISPF remains committed to deepening economic ties and fostering meaningful partnerships, showcasing its dedication to innovation and collaboration at both the national and state levels.

<https://www.financialexpress.com/business/defence/usispf-strengthens-economic-bonds-partnering-with-vibrant-gujarat-global-summit-2024/3360386/>

THE ECONOMIC TIMES

Wed, 10 Jan 2024

Fighter Jet Engine Deal with India to Start this Year: GE Aerospace's Amy Gowder

A fighter jet engine technology deal with the US, which was announced during Prime Minister Narendra Modi's visit to Washington DC last year, is progressing on time and a detailed technical proposal to set up a manufacturing unit in India jointly with Hindustan Aeronautics Ltd (HAL) will be shared with the state-run company early this year, GE Aerospace Defence & Systems President Amy Gowder told ET.

In an exclusive interview, the top executive said the scope of the technology transfer to HAL will be higher than what GE has done with other partners and that options to export engines and components from India are firmly on the table. She added that GE is keen to participate in the development of next generation engines for India's Advanced Multirole Combat Aircraft (AMCA) and has a technological advantage over competitors.

Speaking on the landmark pact to manufacture GE Aviation's F414 INS6 engines in India with HAL as the lead partner that was announced during Modi's visit to the US, Gowder said a detailed technology transfer process is underway.

"Early this year, we will have a proposal to them and that kicks off formalising the agreement with HAL and the government. We will bring over our engineers and supply chain resources to start the co-production. It will take most of this year to get it kicked off and going," she said.

The timeframe for starting engine production will depend on the requirements of the Indian Air Force and Defence Research and Development Organisation but broad plans are to prepare for deliveries within three years.

Valued at nearly \$1 billion, the deal will lead to an 80% technology transfer for the F414 engines, which will include coating for the hot end of the engine as well as crystal blades and laser drilling technology. The engines will power the Mk2 version of the Light Combat Aircraft as well as initial batches of AMCA. Currently, GE's F404 engines power the under production LCA Mk1A version as well as in service LCA fighter jets of IAF.

Gowder said GE has experience in technology transfer but has never done it to such an extent. "We have done this before with Korea and Turkey but never to this degree. So, it is a very special technology transfer for India. They (HAL) will have the most content than any other partner around the world," she said.

On prospects of the American company for an Indian requirement of next generation fighter engines with a thrust of at least 110 kilo newtons, Gowder said GE is actively working with the Indian government.

"We are honoured to be part of the prototype for the Mk1 version (of AMCA). F414 has to grow in thrust, capacity and performance, and would be an advantage to India and would be very well suited for the aircraft," she said, expressing confidence in meeting the technology transfer requirements that India is likely to propose for production of the next generation engines.

"Because of our long history of integrating (engines) on indigenous platforms and because we are on the prototype of AMCA, we know we have the competence and can bring the technology that the Indian government wants," the top executive said.

<https://economictimes.indiatimes.com/news/defence/fighter-jet-engine-deal-with-india-to-start-this-year-ge-aerospaces-amy-gowder/articleshow/106676912.cms?from=mdr>



Tue, 09 Jan 2024

Surface Navy 2024: USN still Struggles for More Powerful Lasers to Counter Cruise Missiles

The successful missile and unmanned aerial vehicle (UAV) defence by US Navy (USN) ships in the Red Sea has prompted discussion for accelerated development of lasers on USN surface ships in such scenarios.

However, the USN is still struggling, trying to achieve the power necessary for missile defence, according to defence analysts.

"Most of the problem is trying to aim for higher powers that can be useful against cruise missiles – like 300 kW – when the technology is still not mature enough to use in a combat setting," Bryan Clark, a senior fellow at the Washington think-tank Hudson Institute, told Janes in advance of the Surface Navy Association (SNA) National Symposium 2024, which started on 9 January.

"There are several working 150 kW lasers out now, like the navy HELIOS [high-energy laser with integrated optical-dazzler and surveillance]," Clark noted.

“They are good against drones, but can only shoot one at a time and take 5–10 seconds for the laser to burn through the drone,” Clark said. “That works because drones are slow and the laser should be able to take out several in a swarm. Against a faster cruise missile, the burn through could take too long to stop the missile before it reaches the target. But more powerful lasers require extra power conditioning and storage and cooling, which most ships cannot accommodate without bringing on a container with batteries and cooling units.”

<https://www.janes.com/defence-news/news-detail/surface-navy-2024-usn-still-struggles-for-more-powerful-lasers-to-counter-cruise-missiles>

Science & Technology News



Wed, 10 Jan 2024

Indian Patent Granted for Work on Secure Quantum Communication

A software for simulating Quantum Key Distribution (QKD) experiments that could be used to validate such experiments before spending resources on the actual setup, has been granted a patent recently, marking one the first of India’s patents on quantum technology.

The experimentally friendly tool for which Raman Research Institute (RRI) has been awarded an Indian patent in the field of Quantum Technologies, can be used to design optimal design parameters when planning for such experiments.

The patent was granted for ‘Method and system for generating cryptographic keys’ to the team led by Professor Urbasi Sinha for their work on secure Quantum communication. The merit of the work lay in the versatility of the software for simulating Quantum Key Distribution (QKD) experiments.

“Our invention, qkdSim, provides a tool to design QKD, which circumvents the huge experimental trial-and-error approach. It overcomes the problem by applying the software development model Agifall, whose three-layered architecture conveniently abstracts simulation of real physical processes. qkdSim comprises distinct modules that model different physical processes and components and combine to simulate full end to end QKD. This simulation enables design and testing implementations for validation and optimisation,” said Professor Sinha.

Last year, India launched the National Quantum Mission which is being co-ordinated by the Department of Science and Technology (DST) and RRI, an autonomous institution of DST has been actively involved in this major technological challenge. With the increase in sensitive and personal data becoming digital and made available online, there is an inevitable need for securing and shielding it with leak-proof encryption.

QKD is a globally relevant technology that is currently being pursued towards providing a new paradigm for data security that is based on laws of nature, in this case, laws of quantum mechanics.

“This is especially crucial to ensure that we shift away from other forms of cryptography that use mathematical hardness of problems as their bases, which can be broken. Our invention will help

both in optimal design and validation of available QKD products for their realistic performance expectations. This in turn will help us evolve high end data security that would benefit several sectors including banking transaction, defence services, health sector and many more,” said Sinha.

<https://www.dailypioneer.com/2024/india/indian-patent-granted-for-work-on-secure-quantum-communication.html>



Wed, 10 Jan 2024

What is the Square Kilometer Array Project, Significance of India Joining it

By Amitabh Sinha

The new year ushered in the news that India had decided to formally join the Square Kilometer Array (SKA) project, an international scientific collaboration working to build the world’s largest radio telescope.

India had already been contributing to the project for the past several years, but the full member status, which offers greater scientific opportunities to use the upcoming facility, requires countries to sign and ratify an international treaty, and also make a financial commitment. India has approved Rs 1,250 crore for the project, which includes its funding contribution for the construction phase.

The decision to join SKA as a full member ensures India’s participation in yet another international mega science project in the most advanced areas of scientific research. India has already decided to build a gravitational wave detector to join the international LIGO (Laser Interferometer Gravitational Wave Observatory) network, and is a full member of the ITER project, which is working to harness energy from nuclear fusion reactions. India also has a strong participation in the Large Hadron Collider (LHC), the world’s largest and most powerful particle accelerator that is running some of the most exciting experiments in particle physics.

The SKA

The Square Kilometer Array will not be a single large telescope, but a collection of thousands of dish antennas operating as a single unit. The name, Square Kilometer Array, comes from the original intention to create one square kilometre (one million square metre) of effective area for collecting radio waves. This was meant to be achieved by installing thousands of smaller antennas in a specific array design that would make them function like a single radio telescope. As of now, it appears that the USD 2.4-billion project (2021 prices) would eventually have a lesser collecting area than one square kilometre, but the original name has been retained.

The antennas, about 200 of them in South Africa and more than 130,000 in Australia, are being installed in sparsely populated locations, chosen to ensure they are as far away from human activities as possible. This has been done in order to minimise signal interference from undesirable Earth-based sources. Construction at both the sites began in December 2022, and the first phase of the project is expected to be completed by next year.

Once operational, SKA would be between 5 to 60 times more powerful than the most advanced existing radio telescopes functioning in comparable frequency ranges.

What’s in it for India

Though none of the SKA facilities would be located in India, there are immense science and technology gains for the country by participating in the project as a full member. In this regard,

SKA offers opportunities similar to the LHC or the ITER, which too are located on foreign soil but have brought rich dividends to the Indian scientific community.

Radio astronomy is something in which India already has highly developed capabilities. The Giant Meterwave Radio Telescope (GMRT) near Pune is one of the most advanced — and sought-after — facilities in the world, which has been producing remarkable scientific results. There are other similar facilities in Ooty, Nainital and Bengaluru. The SKA, which will become the most promising tool for research in the most pressing scientific questions in astronomy, offers the next logical step forward for Indian scientists working in this area.

A full member status would provide India preferential access to the SKA facilities. Most existing telescopes operate under an open-use policy which allows research groups from any country to get time on the facility through competitive bidding by making a scientific case. This is how the GMRT also works. But there is a growing argument that countries that contribute to building any large international project should have priority access to that facility. This is likely to be the case with the SKA. Member countries will get preferential allocation of time on the radio telescope, roughly in proportion to their contribution to the project, and only limited time slots would be available through competitive bidding.

There are technology benefits as well. The SKA would work on highest-end technologies, including electronics, software, materials science and computing. The intellectual properties generated by the project, though owned by the SKA Observatory, would be accessible to all the member countries. This can offer huge learning opportunities for scientists, academics and even private industry.

Participating in the project is also expected to result in expanding the science and technology base in this area, along with capacity building and training opportunities. The Indian participation in the project is being led by Pune-based National Centre for Radio Astrophysics (NCRA), but 22 institutions are collaborating on SKA-related activities in the country. These include not just leading research institutions and some IITs and IISERs, but also a couple of universities and colleges. A few private companies are also involved.

India's involvement

India has been involved in the SKA project right from its inception in the 1990s, and contributed to the design and development of the telescope as well as in negotiating the SKA Observatory Convention, the international treaty that established the facility as an intergovernmental organisation. The main contribution has come in the development, and operation, of the Telescope Manager, the 'neural network' or the software that will run the entire facility.

There are plans to set up an SKA regional centre in the country that will be part of the global network to process and store data and make it available for the scientific community.

Indian scientists have identified several areas of research for which they want to use the SKA telescopes. These include studies relating to the evolution of the early universe, the formation and evolution of galaxies, neutron star physics, and solar sciences. More than 150 scientists, researchers, and students from over 30 different Indian institutions, including a few private companies, have been participating in ongoing science activities related to the SKA.

<https://indianexpress.com/article/explained/explained-sci-tech/what-is-the-square-kilometer-array-project-significance-of-india-joining-it-9102401/>

