CENTRE FOR AIR POWER STUDIES (CAPS)
Forum for National Security Studies (FNSS)

AEROSPACE NEWSLETTER

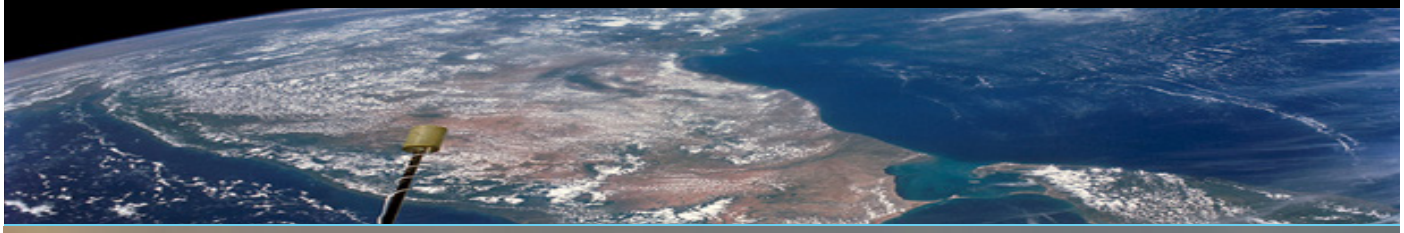

Image Courtesy: ketto.org

VOL IV NO 10 **05 October 2024**

"We must develop innovative processes to cater for evolving defence needs in quick time. We must cross-pollinate between the industry and the Air Force to ensure that the India at 100 years possesses an Air Force that is capable of addressing all challenges that are likely to be posed 25 years from now."[1]

- Air Chief Marshal VR Chaudhari PVSM AVSM VM ADC

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[1] Air Chief Marshal VR Chaudhari, Address at the Bharat Shakti Defence Conclave 2024, https://economictimes.indiatimes.com/news/defence/self-reliance-not-about-isolation-but-also-strengthening-internal-capabilities-iaf-chief/articleshow/113499137.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst

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Air Domain Awareness and Regional Security

Air Vice Marshal Anil Golani (Retd)

Director General,Centre for Air Power Studies |

16 September 2024

Source: Chanakya Forum | https://chanakyaforum.com/air-domain-awareness-and-regional-security/

The Indian Air Force, on the sidelines of 'Tarang Shakti 2024,' the largest multilateral exercise carried out in the country, also conducted a symposium on air domain awareness. The theme of the seminar was "Collaborative Approach to Facilitate Air Domain Awareness Towards Enhancing Regional Security." With participants from over 27 countries comprising 50 delegates, spanning all the continents of the world, the symposium generated debate on an important issue that governs the sovereignty and security of the aerospace domain. The proliferation of drones or unmanned aerial systems, its cheap availability and usage by non-state actors that affords plausible deniability further exacerbates the problem. While sovereign airspace over national territories and airspace demarcated through promulgation of ADIZ (Air Defence Identification Zone) is invariably monitored round the clock, throughout the year, it is international airspace that needs to have the requisite freedom of operation for peaceful use. It is the vast swathes of airspace over trans-oceanic regions that are bereft of surveillance which pose challenges that require a collaborative and cooperative framework to ensure freedom of operation.

With increasing use of the near space region and the non-commercial airspace over the oceans for military operations with High Altitude Pseudo Satellites, (HAPS) the proliferation of hypersonic weapons and long range loiter munitions and ballistic and cruise missiles, the security paradigm for any nation becomes increasingly challenging. More often than not a parallel is drawn between Maritime Domain Awareness (MDA) and Air Domain Awareness (ADA) because it is the airspace over the oceanic regions that requires surveillance. Collaborative arrangements exist between many countries, including India that has an Information Fusion Centre for the Indian Ocean Region (IFC – IOR) with representatives of Friendly Foreign Countries (FFCs) to share white shipping information. However, there is an essential difference between the two that needs to be understood because of the reaction times that differ vastly between the two for countering emerging threats or taking deterrent action. Technology through Automatic Identification System (AIS) and Automatic Dependent Surveillance – Broadcast (ADS-B) facilitates monitoring and surveillance of shipping vessels and commercial aircraft that are governed by regulations to have these transponders installed as a mandatory requirement. There is however nothing that regulates the use of,

other than sovereign airspace for objects using the aerospace medium.

With the growth in air traffic and the use of unmanned aerial systems there is an increased pressure on the aerospace capacity to maintain efficiency and safety. To facilitate this there is a requirement for a collaborative and joint effort to ensure Regional Air Domain Awareness (RADA). It would not be possible for any single nation to do it alone or for an international entity to ensure the same as well as take preventive or coercive action against rogue threats using the aerospace domain that may affect international waters over the Sea Lines of Communication (SLOCs) or intrude into the sovereign airspace of any nation with malafide intent. There exists therefore a need for multilateral cooperation amongst likeminded nations that want to have a RADA picture to counter such threats. There is a requirement to have a vision and a plan to implement this and for the IAF, Exercise Tarang Shakti was an opportune moment, with willing partner nations eager to discuss the subject.

The discussions evolved around creating a framework for data sharing, compatibility of communication networks within the region, the technological infrastructure, capacity building, and collaboration. The networking of sensors within a region is an important first step, as the security of the skies is intrinsically linked to that of its neighbours. Creation of a cohesive regional framework that ensures satellite-based surveillance through ADS – B for commercial aircraft to Over The Horizon (OTH) and long range surveillance radars for manned and unmanned aerial systems that could be potential threats would form the basis for ensuring regional peace and security. Networking of sensors to create a single display with data sharing among regional partners would be the ideal solution that would ensure an appropriate response for any emerging threat. There would however be problems related to the technological infrastructure, interoperability, information fusion, communication networks, data sharing and privacy amongst the regional stakeholders, and the mechanism for dispute resolution that need to be overcome. Policy related issues could also create bottlenecks in implementation.

A different approach could also be top down, from the near space domain to the very low flying objects in the air littoral. As nations develop the capability to carry out surveillance of the near space domain, simultaneously a dialogue to facilitate sharing of this data amongst likeminded regional partners could be the way forward. Data beyond the sovereign airspace of regional countries could be shared in a framework that is partnered by the nations that seek to collaborate for peaceful and secure use of the airspace in the region. With air forces being the natural guardians of the airspace and the merging of the air and space region seamlessly into the near space, the lead needs to be taken by the air forces of the concerned countries. The hosting of a multilateral exercise for air forces of friendly foreign countries that represented 27 nations, gave the IAF a golden opportunity to discuss issues that concern security and stability in the aerospace domain and the region. This symposium on a "Collaborative Approach to Facilitate Air Domain Awareness Towards Enhancing Regional Security" marked the tentative first steps by the IAF in its journey of becoming a

catalyst and a net security provider of the aerial domain, in the region.

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Re-conceptualising Air Power: Essential for Successful Atmanirbharta in Defence

Rahul Manohar Yelwe and Arun Vishwanathan | 17 September 2024

Source: ORF | https://www.orfonline.org/english/expert-speak/re-conceptualising-air-power-essential-for-successful-atmanirbharta-in-defence

For India to achieve greater self-reliance, it is essential to broaden the concept of 'air power' to include a country's ability to design, develop, and manufacture aircraft and critical components.

Imports have been the mainstay of India's defence modernisation. In the aerial domain, with the exception of a few platforms like the Advanced Light Helicopter (ALH), Light Combat Helicopter (LCH), and Light Combat Aircraft (LCA), most aerial platforms operated by the Indian defence forces (including Army, and Navy naval aviation wings) are procured from the international market.

This article argues that to address and remedy the situation and achieve greater self-reliance in defence modernisation, it is important to re-conceptualise our current understanding of 'air power'. Currently, air power is understood in terms of 'capability' and is largely limited to bean-counting aerial platforms like fixed-wing or rotary-wing aircraft, employment of air power, and the destruction of the adversary. This, however, limits our understanding of air power. The essay argues that a country's capacity to design and manufacture aircraft, and critical components and technologies like engines, sensors, materials, etc. are important elements that need to be factored in to holistically assess a country's 'air power'.

Airpower has been a decisive factor in modern warfare since its first use in 1911 during the war in Tripoli, fought between Italy and the Ottoman Empire. Air power and aerial weapons platforms played an extensive role, especially during the Second World War. All wars fought after the Second World War have demonstrated the lethality of air power over all the other means of warfare due to their speed, range, and versatility. Over time, aircraft technology has changed and evolved with technological advancements in material technology, engine capabilities and design, electronics, computing, and simulations. These advancements have drastically enlarged the scope and efficacy of air power.

Classical, Western Views on Air Power

The theorisation of air power commenced with the publication of the book Command of the Air by Giulio Douhet, an Italian theorist in 1921. Along with Douhet, many other scholars such as Hugh Trenchard, Billy Mitchell, John Slessor, and Alexander P. de Seversky produced

ample literature on air power, drawing from the expertise and experience gained through their active military service. Nevertheless, Giulio Douhet and Alexander de Seversky are the only two classical air power theorists who have emphasised the need for developing a domestic aerospace industry and stressed the significance of research and development in the aerospace sector. Both Douhet and Seversky highlight the importance of a strong and vibrant scientific and industrial base for the successful projection of air power.

Giulio Douhet was ahead of his contemporaries since he emphasised the role of industry in the country's air power. Douhet underlined the strong and symbiotic relationship between the Air Force and the aviation industry. Further, he argued that the government must fund research and development of the aircraft and their high-performance engines as it is prohibitively costly, involves high and complex technologies, and has long gestation periods. Similarly, the Russian-American air power theorist, Alexander de Seversky also emphasised the significance of a vibrant scientific and industrial base for an inclusive projection of the country's air power.

As espoused by classical air power theorists, the traditional understanding of air power comprises three components: Army aviation, naval aviation, and air force. However, this is not a comprehensive representation of a country's 'air power'. In modern-day warfare, the space and civil aviation industry has emerged as a crucial element of air power. In addition, the domestic aerospace industry and research and development capabilities have emerged as important elements of the country's air power, which are essential to furthering the country's self-reliance in developing and manufacturing aircraft to meet its defence needs.

The Indian View

The Indian Air Force's (IAF's) doctrines are an authoritative account of the country's views on air power. Like other services, the IAF too has revised and updated its doctrines from time to time. The IAF doctrine was released for the first time in 1995 and was subsequently updated and released in 2007, 2012, and 2022. The 1995 and 2007 versions of the doctrine are not available in the public domain. However, the IAF publicly released the 2012 and 2022 versions of its doctrine.

An analysis of the 2012 and 2022 versions of the IAF's doctrines highlights similarities between the IAF's existing conceptual understanding of air power and classical Western thinking on air power. The documents have described the various military-centric and non-military roles that the IAF has to undertake. For instance, Humanitarian Assistance and Disaster Relief (HADR) is a primary non-military-centric role, whereas military-centric roles such as ground attack, air defence, airlifting, and Intelligence, Surveillance, and Reconnaissance (ISR) operations. However, the IAF doctrines have also focused on other elements of air power such as the space domain and civil aviation. In sum, the 2012 and 2022 versions of the IAF are largely steeped in the classical understanding of air power, which has limited their conceptualisation of air power to counting the number and prowess of the IAF's aerial platforms.

This is particularly surprising given the fact

that the large majority of the IAF's fleet, be it basic trainers, large-size strategic transport aircraft, weapon packages, and associate systems are all of foreign origin. While some of these systems have been purchased in government-to-government deals to meet immediate operational requirements, others have been manufactured under licensed production.

Despite this, the 2012 and 2022 doctrines of the Indian Air Force do not stress on building up domestic capability and capacity in aircraft development and manufacturing. The IAF Doctrine 2022 devotes a single line (pg.18) to indicating the IAF's commitment to self-reliance. The doctrine states, "To foster and contribute towards enabling the required degree of self-sufficiency in the aerospace industry and aerospace technology through indigenisation to achieve the desired degree of technological independence." Thus, part of the challenge to build up and sustain significant capabilities in self-reliance in aircraft design, development, and manufacturing is the crying need to modify the existing limited understanding of air power. This is currently stymied by the dominant and popular understanding of air power that is steeped in the Western classical understanding.

In conclusion, there is a need to re-conceptualise and essentially widen the concept of 'air power' and move beyond the limited focus on the quantity of aircraft, deployment strategy, and attaining air supremacy. The concept of 'air power' will remain incomplete and limited unless it includes the country's capability and capacity to design, develop, and manufacture civilian and military aircraft, and critical components like engines, sensors, and materials. Only a wider and more comprehensive understanding will project the true picture of the country's actual prowess as an 'air power'.

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Air Power

Tarang Shakti: "We are going to Formalize the Pattern in which we will Hold Such Exercises" Says Air Chief Marshal VR Chaudhari

13 September 2024

Source: Economic Times | https://economictimes.indiatimes.com/news/defence/tarang-shakti-we-are-going-to-formalize-pattern-in-which-says-air-chief-marshal-vr-chaudhari/articleshow/113306403.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst

Tarang Shakti: "We are going to formalize pattern in which..."says Air Chief Marshal VR Chaudhari

Addressing a press conference, Air Chief Marshal VR Chaudhari said that we are now going to formalize a pattern to hold exercises, particularly Tarang Shakti.

"We are lacking a common data link to be able to share data with friendly foreign nations. The biggest lesson for us is to speed up the

process of procuring and setting up a data link that can have interoperability with other air forces as well for future exercises," Air Chief Marshal VR Chaudhari said on Thursday.

"We are now going to formalize the pattern in which we will hold such exercises, particularly Tarang Shakti, a multilateral one," he further said.

Defence Minister Rajnath Singh on Thursday attended the multilateral aerial exercise 'Tarang Shakti 2024'.

In his address, the Defence Minister said, "Indian Air Force and defence sector are moving ahead rapidly with resolution of self-reliant India".

He added that India's defence sector has taken strong steps towards indigenisation in the manufacture of weapons, platforms and aircraft.

Singh said, "We have become self-sufficient to a large extent in things like Light Combat Aircraft, Sensors, Radars and Electronic warfare, and we are constantly striving to move ahead in these areas."

'Tarang Shakti' has been organised in two phases. Its first phase was organised in Sulur, while its second phase is being organised in Jodhpur.

He said that when any exercise takes place on such a large scale, the countries participating in it learn a lot from each other. When an exercise of such complexity, and of such a large magnitude, takes place, soldiers with different work cultures, different air combat experiences, and warfighting principles learn a lot from each other.

"We are not only the fastest growing economy in the world, but our armed forces are also considered one of the most powerful armed forces in the world," he said.

The multilateral aerial exercise 'Tarang Shakti 2024' on Thursday also showcased the display of Surya Kiran aircraft and Tarang helicopters of the Indian Air Force (IAF).

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Exercise Tarang Shakti – 2024: Phase 2 of Multinational Air Drills Starts in Rajasthan's Jodhpur with some Notable Firsts in India

03 September 2024

Source: India Sentinels | https://www.indiasentinels.com/air-force/exercise-tarang-shakti-2024-phase-2-of-multinational-air-drills-starts-in-rajasthans-jodhpur-australia-and-bangladesh-field-combat-aircraft-in-india-for-first-time-6479#google_vignette

Jodhpur: The second phase of Exercise Tarang Shakti – 2024, India's largest multinational air exercise, commenced at the Jodhpur Air Force Station, Rajasthan, on August 30. This phase, which will run until September 14, will see the participation of 18

countries, including Australia, Bangladesh, Greece, Singapore, the United Arab Emirates, and the United States.

The first phase of Tarang Shakti was conducted in the Sulur Air Force Station from August 6 to August 14, as India Sentinels had reported.

Like its first phase, the second phase of the exercise is also aimed at enhancing interoperability and fostering international cooperation among the participating air forces. In these drills, the Indian Air Force is showcasing a wide array of its advanced military assets, including the Jaguar, LCA Tejas, MiG-29, Mirage, Rafale, and Sukhoi-30MKI fighter aircraft.

The IAF's Prachand and Rudra attack helicopters along with its ALH Dhruv helicopter, C-130J Hercules tactical transport plane, Ilyushin-78 midair refuellers, and AWACS (airborne warning and control system) aircraft will also take part in the Tarang Shakti Phase 2 drills.

Notable Firsts

Exercise Tarang Shakti Phase 2 is witnessing some notable firsts in India. A major highlight of this phase is the participation of the Royal Australian Air Force, which has fielded its combat aircraft in a multinational exercise in India for the first time. The RAAF has deployed three EA-18G Growler aircraft from its No 6. Squadron, accompanied by up to 120 personnel.

The chief of the RAAF, Air Marshal Stephen Chappell, emphasized the importance of this participation. He said India is a top-tier security partner for Australia, and through the Comprehensive Strategic Partnership between Australia and India, the Australian government is continuing to prioritize practical and tangible cooperation that directly contributes to Indo-Pacific stability.

He further highlighted that the exercise provides an opportunity for Australian aviators to develop interoperability with foreign militaries and foster international relations.

The exercise also features Bangladesh Air Force's fighter jets. This is the first time Bangladesh warplanes will fly from Indian soil. Additionally, this is Greece's first-ever participation in a military exercise in India, which is in reciprocation of India's participation in the Iniochos exercise hosted by Greece in April 2023, as India Sentinels had reported then.

With over 67 fighter jets taking part in the drills, the first edition of Exercise Tarang Shakti stands as a significant display of multinational military collaboration. This large-scale operation highlights India's growing role in advancing international defence partnerships and bolstering security across the region.

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IAF Completes Exercise Eastern Bridge-7 with Royal Air Force of Oman in Masirah, Oman

25 September 2024

Source: News on Air | https://www.newsonair.gov.in/iaf-completes-exercise-eastern-bridge-7-with-royal-air-force-of-oman-in-masirah-oman/

The Indian Air Force has successfully completed Exercise Eastern Bridge-7 with the Royal Air Force of Oman in Masirah, Oman. The exercise included a comprehensive series of training missions, which featured the participation of MiG-29 and Jaguar aircraft from the Indian Air Force and F-16 and Hawk from the Royal Air Force of Oman.

The Defence Ministry said that the completion of the exercise underscores the commitment of India and Oman towards maintaining regional peace and security. It also added that both forces demonstrated their capability to operate jointly in diverse scenarios, enhancing their preparedness to face emerging security challenges.

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Indian Air Force Deploys C-17 Globemaster for Flood Relief in Laos and Vietnam

15 September 2024

Source: Financial Express | https://www.financialexpress.com/business/defence-indian-air-force-deploys-c-17-globemaster-for-flood-relief-in-laos-and-vietnam-3611616/

The efficient loading and coordination of aid were managed by the C-17 team at Hindan

The Indian Air Force (IAF) has dispatched its C-17 Globemaster aircraft to conduct Humanitarian Assistance and Disaster Relief (HADR) missions in Laos (Vientiane, Laos) and Vietnam (Hanoi), following the severe flooding triggered by Typhoon Yagi.

The efficient loading and coordination of aid were managed by the C-17 team at Hindan. The relief materials include:

- 35 tons aid for Vietnam, comprising water purification supplies, water containers, blankets, kitchen utensils and solar lanterns
- 10 tons aid for Cambodia, including generators, water purification items, hygiene products, mosquito nets, blankets and sleeping bags

The C-17 Globemaster, known for its

extensive cargo capacity and long-range operational capabilities, is ideal for transporting essential supplies and personnel to areas affected by disasters.

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IAF Conducts Symposium on 'Air Domain Awareness' During Exercise Tarang Shakti 2024

11 September 2024

Source: PIB | https://pib.gov.in/PressReleaseIframePage.aspx?PRID=2053906

As part of Exercise Tarang Shakti, India's largest multinational air exercise aimed at enhancing interoperability and operational coordination among Friendly Foreign Countries (FFCs), the Indian Air Force (IAF) organized a multinational symposium on 'Air Domain Awareness' on 11th September, at Jodhpur. The theme of the symposium was "Collaborative Approach to Facilitate Air Domain Awareness Towards Enhancing Regional Security."

The event saw participation from over 50 delegates, representing 27 nations involved in Exercise Tarang Shakti. Air Marshal Surat Singh AVSM VM VSM, Director General Air (Operations), IAF, welcomed the participants and delivered the keynote address. International delegates shared their concepts of air domain awareness and discussed strategies to tackle challenges from both national and regional perspectives. The symposium fostered an open exchange of ideas among subject matter experts on emerging challenges related to air situational awareness and airspace management. Discussions focused on policy matters and technological solutions for effective information sharing.

The closing address was delivered by Air Vice Marshal PV Shivanand VM, Assistant Chief of Air Staff Operations (Air Defence).

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Space

Cabinet Approves Funds for Four Space Missions, Including Chandrayaan-4, Venus Orbiter Mission

19 September 2024

Source:HindustanTimes|https://www.hindustantimes.com/india-news/cabinet-approves-funds-for-four-space-missions-including-chandrayaan-4-venus-orbiter-mission-101726686658363.html

Cabinet approves funds for four space missions, including Chandrayaan-4, Venus orbiter mission

The Union Cabinet on Wednesday green-lit four important space endeavours for launches by the Indian Space Research Organisation (Isro) in the near future – the first of which is the fourth iteration of India's lunar mission

Chandrayaan-4; the second, the development of Venus Orbiter Mission (VOM); the third, the building of first unit of India's indigenous space station, dubbed Bharatiya Anatriksh Station (BAS), by extending the scope of Gaganyaan programme; and finally, the development of Next Generation Launch Vehicle (NGLV).

India's fourth mission to the Moon, for which a budget of ₹2,104.06 crore was cleared, will build on the success of Chandrayaan-3, with which India became the first country to land a probe on the lunar south pole, and till date remains the standout mission among all of Isro's achievements on the global stage.

Chandrayaan-4 will be a remote mission seeking to retrieve samples of the lunar surface. The mission, which will aim to bring rock samples from the lunar surface back to Earth after a soft landing, is slated for launch in 2027 and will expand on the technology developed in Chandrayaan-3 by adding elements like lunar docking, precision landing, sample collection and a safe journey back to Earth.

"It would make everyone proud that Chandrayaan-4 has been cleared by the Cabinet! This would have multiple benefits, including making India even more self-reliant in space technologies, boosting innovation and supporting academia," Prime Minister Narendra Modi wrote on X.

"This mission will achieve the foundational technologies capabilities eventually for an Indian landing on the Moon (planned by year 2040) and return safely back to Earth," according to a government statement, which added that the mission is expected to be completed in 36 months of approval.

The approved cost for the mission includes spacecraft development and realisation, two launches of Launch Vehicle Mark-3 (LVM-3), external deep space network support, and conducting special tests for design validation, finally the mission of landing on Moon and safe return to Earth along with the collected lunar sample.

The second major approval of ₹1,236 crore was for VOM – India's first scientific mission to Venus, which aims to enable scientists to better understand the Venusian atmosphere, and geology and generate data that gives information into the planet's thick atmosphere.

The mission, which has set a target of March 2028, involves sending an orbital spacecraft to study the planet closest to Earth. Venus is believed to have formed in conditions similar to Earth, but the planet deviated due to a runaway greenhouse effect, making it uninhabitable for life. It offers a "unique opportunity to understand how planetary environments can evolve very differently", the statement said.

The third approval was for the Gaganyaan follow-on missions and the building of Bharatiya Antariksh Station, or BAS.

Perhaps India's most ambitious space project, BAS, aims to establish an Indian space station that will orbit 400km above the Earth's surface. The 52-tonne behemoth will serve as a research platform for Indian astronauts and scientists to conduct experiments in microgravity, astronomy, and Earth observation, and will allow astronauts to stay in orbit for 15-20 days. Wednesday's

approval was for the first module of the project (dubbed BAS-1), which targets a launch in 2028. The target to complete the entire project is for 2035, according to ISRO.

The project, which saw a net additional funding of ₹11,170 crore, expands the coverage of the Gaganyaan mission (slated to kick off next year).

"Revision in Gaganyaan programme to include the scope of development and precursor missions for BAS, and factoring one additional uncrewed mission and additional hardware requirement for the developments of ongoing Gaganyaan programme. Now the human spaceflight programm is through eight missions to be completed by December 2028 by launching the first unit of BAS-1," the statement said.

Also approved by the Union Cabinet was the development of the NGLV , a new launch vehicle that is capable of high payload, and will be cost-effective, reusable, and has the potential to be commercially viable.

According to the government, NGLV will have three times the present payload capability with 1.5 times the cost compared to LVM-3. It will also have reusability resulting in low-cost access to space and modular green propulsion systems. In total, ₹8,240 crore was approved for NGLV, which includes development costs, three developmental flights, essential facility establishment, programme management and launch campaign, the statement said.

Jammertest 2024 is Underway

Jesse Khalil | 11 September2024

Source: GPS World | https://www.gpsworld.com/jammertest-2024-is-underway/

JammerTest in Bleik, Andoya, Norway. (Photo: David Jensen)

GNSS jamming trials have begun on the Island of Andoya in Northwestern Norway as part of Jammertest 2024. This event features both simple and sophisticated staged spoofing and jamming attacks, allowing participants to identify potential strengths and weaknesses in their GNSS-based systems.

The increasing frequency of jamming and spoofing incidents, particularly affecting Northern Norway and possibly linked to Russian activities, drives the demand for more resistant GNSS and non-GNSS-based contingency systems. In response, the Norwegian Defense Ministry has called for the development of alternative means of positioning, navigation, and timing (PNT) provisions to protect against GNSS jamming in maritime navigation.

During Jammertest 2024, researchers from both public and private sectors are assessing how effectively existing and new technology systems can withstand jamming and spoofing attacks in real-world scenarios. One of the staged jamming attacks, taking place from

Sept. 4-13, 2024, is occurring on two stretches of road near Bleik, a small coastal town on Andøya Island. This trial was approved by Norway's National Communications Authority and is being carried out by the Public Roads Administration, Defense Research Institute, Norwegian Space Center, and other partners.

Later in September 2024, the Defense Research Institute will conduct military jamming tests on Andøya, focusing on operational testing of military weapons systems and loss of GPS signals. Local inhabitants have been notified that they may experience relatively short-lived GNSS disruption during these trials, most of which will involve GPS jamming but not spoofing or meaconing.This year marks the third consecutive year that Jammertest is being held on Andøya, which is also the site of Norway's Andøya Space Center.

The event has garnered record-high interest worldwide, with more than 300 applicants for Jammertest 2024. During the 2023 edition, 264 comprehensive tests were conducted, exploring various topics such as sensor fusion, radio frequency interference (RFI) countermeasures, and combinations of GNSS with alternative positioning, navigation and timing (PNT) solutions.

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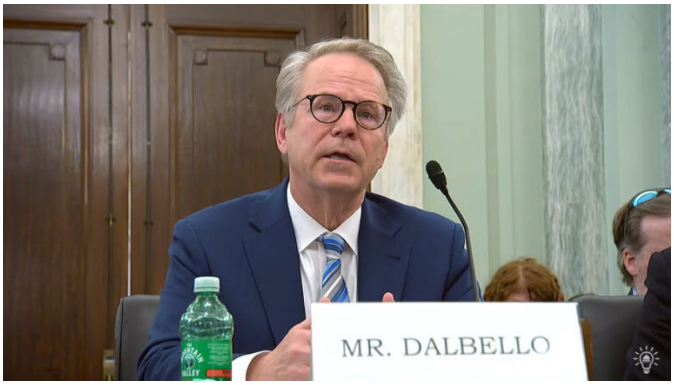
Commerce 'On Track' for Version 1.0 of the Space Tracking System, Using DoD Data

Theresa Hitchens | 12 September 2024

Source: Breaking Defense | https://breakingdefense.com/2024/09/commerce-on-track-for-version-1-0-of-space-tracking-system-using-dod-data/



On Dec. 13, 2023, Office of Space Commerce Director Richard DalBello testified before the Senate Committee on Commerce, Science, and Transportation, at a hearing on "Government Promotion of Safety and Innovation in the New Space Economy." (Photo: NOAA Office of Space Commerce)

WASHINGTON — The Commerce Department is readying the final step towards launch of its space object tracking system for non-military satellite operators, a key new responsibility the department is taking over from the Pentagon.

"We are weeks away from launching the Traffic Coordination System for Space (TraCSS)," Deputy Secretary Don Graves told the US Chamber of Commerce's Global Aerospace Summit 24 on Wednesday. "It's time for us to migrate this to the Department of Commerce."

Graves and other senior officials said the department will meet its Sept. 30 roll-out deadline, although the debut product will represent only a minimal capability.

The National Oceanographic and Atmospheric Administration's Office of Space Commerce (OSC) has been working since 2018 on the effort to establish a new process for taking on what is now a Defense Department's mission to keep tabs on satellites and dangerous space junk and warn non-military operators of possible on-orbit crashups. Commerce leadership, working with Congress and the Office of Management and Budget, in 2023 set this fall as the deadline for achieving that goal.

"TraCCS is on track," OSC Director Richard DalBello told the summit during a later panel. He explained that the final step, coming shortly, is to contract for "what we call the presentation layer, or more commonly the webpage 'TraCCS.gov'."

OSC already has contracted with Amazon Web Services to provide its cloud services, and Parsons to provide systems integration.

"Over 2025 we will build out the system. We'll open the TraCCS.gov website to satellite owner operators and other users, and we'll begin the transition of all the people who are on [DoD's] Space-Track.org who are not national security customers. We'll begin that transition, with the goal of completing it at the end of 2025," DalBello said.

That said, DalBello stressed that the roll out will comprise a "minimum viable product" — rather than a more fulsome operating system as OSC had previously planned.

"We will be using the DoD system, the DoD website, to store the data for operators. But we will be able to take DoD Information, we'll be able to take operator information, and we'll be able to use our system to create conjunction data messages and orbital determination for the satellites that we're covering," he said.

"Operators that are working with this know that this is not operational data yet. This is not data that they should be relying on for safety services yet," he added.

DalBello explained to Breaking Defense that this first version of TraCCS will in essence duplicate the data that DoD currently provides, although the system will process incoming and outgoing data every four hours rather than DoD's every eight hours. But TraCCS will evolve and improve over time under an agile development process, he said.

Commerce's goal is to eventually create a free, government-owned collision warning service accurate enough to provide a baseline of space tracking data for satellite operators to be able to ensure a modicum of safety if they decide to move out of the way of a potential crash — unlike DoD's current warning system that has a fairly big margin of error. The move will also free up Pentagon resources to focus more directly on military space matters, officials have said.

The problem is that Commerce leaders at the same time want to promote the handful of domestic commercial providers of space situational awareness (SSA) data and collision warning analysis that have sprung up over the past decade or so. Thus, they do not want TraCCS to become a competitor or squeeze those companies out of the marketplace.

"The plan is to integrate our SSA providers

to get basic data out there that is free of charge to operators," Graves said. "We want to give that basic service, but make sure our commercial SSA providers are able to continue to innovate and beat the pants off of other companies in the world. … We are going to help drive the commercial marketplace by being an acquirer of data … to grow the industry significantly over the next couple of years."

Meanwhile, OSC also is hoping to help industry help itself, by promoting the creation of voluntary standards for safe on-orbit operations as part of the TraCCS project. The office has initiated a new "pathfinder" project, "that will examine the efficacy of generating improved satellite ephemeris based on data provided by satellite owners/operators (O/O's)," according to a Sept. 10 announcement.

"OSC is investigating this capability to help inform quality standards for satellite ephemerides, and means of achieving those standards, for the system. Ephemeris (plural: ephemerides) is a table indicating a space object's position and velocity at specific times," the announcement added.

The solicitation via DoD's Global Data Marketplace is asking interested vendors to submit proposals for three different potential buys:

- An order to generate ephemerides for a given set of satellites in low Earth orbit (LEO);
- An order to generate ephemerides for a given set of satellites in geostationary Earth orbit (GEO); and
- An order for two companies to provide data quality monitoring services related to the above two orders

Further, DalBello told Breaking Defense that OSC has been working closely with the European Union to try to align it's nascent Space Surveillance and Tracking System with TraCCS, in order to avoid the development of two different sets of measurement data that could result in operators working at odds in trying to avoid collisions.

The eventual evolution of an international space traffic management system, however, will be a job for another day and another head of OSC — as DalBello intends to step down at the end of year. And this isn't a pro-forma, end-of-administration resignation, he told Breaking Defense, but actual retirement.

"I've done this three times. People are going to stop taking me seriously," DalBello said, with a laugh.

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Indian Space Station will Enable Research in Bioastronautics, Biological Research, Drug Discovery: ISRO Chairman

20 September 2024

Source: Economic Times | https://economictimes.indiatimes.com/tech/technology/indian-space-station-will-enable-research-in-bioastronautics-biological-research-drug-discovery-isro-chairman/articleshow/113532897.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst

A Station in Space will enable India's astronauts to do research in Space like Bioastronautics, biological research, drug discovery, and material science research in Space, said the Indian Space Research Organisation (ISRO) Chairman S Somanath here on Friday.

He was talking at a press briefing at the Bengaluru Space Expo organised by the Confederation of Indian Industry (CII).

"We are also looking at how to collaborate with other nations. There are already discussions happening with other nations on how to work together in building Space Stations and its utilisations, and joint Missions etc," he said.

Building the Space Station is an important activity. "With India launching several satellites, it is important to have a permanent habitat, where astronauts can go and stay. Gaganyaan programme was only a one-time Mission of sending astronauts to Space but that is not enough. We need to have a continuity of Missions. Our first Mission is still not achieved, we are already looking at how we can continue this programme," he said.

The four projects approved by the Union Cabinet on Wednesday that includes Chandrayaan-4, Venus Orbiter Mission, a New Generation Launch Vehicle, and building the Bharatiya Antariksh Station (an extension of the Gaganyaan programme) has an outlay of around Rs. 22,000 crore, he said.

This long term Mission includes other goals that will inspire generations and create a technological jump in Space activities, apart from the typical activities of ISRO in applications, communications and remote sensing, said Somanath.

"The ultimate vision is to have an Indian landing on the Moon by 2040, and come back to Earth safely. We also want to have a Space Station built and operated by 2035. We need to make incremental steps in developing technologies and capabilities. The first phase will last about six to eight years for which projects have been approved," he said.

Chandrayaan-4 will be a continuation of Chandrayaan-1, 2, and 3, and there will be further missions of Chandrayaan, the Space agency head said. "We will continue to go to the Moon and create a step-by-step process,"

he said.

Payload Capability

Currently, India has 10 tonne payload capability, Somanath said, which will be increased to 30 tonnes with the launch of the Next Generation Launch Vehicle. "It is not just payload capability, we are looking at how to bring down the cost of access to Space substantially by bringing in modularity, reusability, etc," he said.

Venus Orbiter Mission

Venus is important because "we have successfully gone to Mars, the Moon, and Venus is nothing different from Mars. It is our nearest planet", said Somanath.

"Though we went to mars a little farther away Venus is closer but it is more challenging than Mars. The atmosphere of Venus has 100 times more pressure than Earth. Mars, Venus and Earth are sister planets. They look alike in terms of their size, geometry, mass, gravity and speed etc. But Earth is habitable. Why is Mars or Venus not habitable? We do not know. Tomorrow Earth may become uninhabitable due to some reasons," he explained.

This is why the Mission to Venus has been taken up. There are other nations like the US, Russia, China and Japan. "They are also sending missions to Venus by 2028. The timeline which we have also set. We are looking at creating more knowledge about our place in the Universe. These are important missions. More will come in the coming days," he said.

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Gaganyaan to be Launched by End of this Year, Says ISRO Chief

Andrew Jones | 09 August 2024

Source: Economic Times | https://economictimes.indiatimes.com/news/science/gaganyaan-to-be-launched-by-end-of-this-year-says-isro-chief/articleshow/113517270.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst

ISRO chief S Somnath

Indian Space Research Organisation (ISRO) Chairman S Somanath said that efforts are being made to launch India's first human space flight program, Gaganyaan by the end of this year.

"Gaganyaan is ready for launch, we are trying to launch it by the end of this year," Somanath said as he visited the Space Expo in Karnataka's Bengaluru on Friday.

The Union Cabinet on Wednesday approved the building of the first unit of the Bharatiya Anatriksh Station by extending the scope of the Gaganyaan program.

The Gaganyaan Programme approved in December 2018 envisages undertaking human spaceflight to Low Earth Orbit (LEO) and laying the foundation of technologies needed for an Indian human space exploration programme in

the long run.

On Chandrayaan 4, Somanath said that ISRO has completed the engineering for the mission.

"Cabinet has just announced its (Chandrayaan 4) approval, so there will be updates in the next few months, right now we have completed the engineering, we got the approval from the Cabinet, it has to go through many layers of approvals. Chandrayaan 3 was only to go there and land softly so now to come back from the moon is equal to another one more mission. So the overall size of the satellite becomes almost double. The number of modules becomes 5 and we don't have launch capability, so we have to do with two launches. So that way, it is much more complex," the ISRO chief said while speaking to ANI.

On September 18, the Cabinet approved the mission to the moon, named Chandrayaan-4 to develop and demonstrate the technologies to return to Earth after successfully landing on the Moon and also collect moon samples and analyse them on Earth.

The Chandrayaan-4 mission will achieve the foundational technologies and capabilities eventually for an Indian landing on the moon (planned by the year 2040) and return safely back to Earth. Major technologies that are required for docking/undocking, landing, safe return to earth and also accomplish lunar sample collection and analysis would be demonstrated.

The central government has outlined an expanded vision for the Indian space programme during the Amrit Kaal that envisages an Indian Space Station (Bharatiya Antariksh Station) by 2035 and an Indian Landing on the Moon by 2040.

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Radian Aerospace Begins Tests of Spaceplane Prototype

Jeff Foust | 25 September 2024

Source: Space News | https://spacenews.com/radian-aerospace-begins-tests-of-spaceplane-prototype/

Radian Aerospace performed taxi tests and "short hops" of PFV01, a prototype of the reusable orbital spaceplane it is developing. Credit: Radian Aerospace

WASHINGTON — Radian Aerospace, a company with ambitions to develop a reusable orbital spaceplane, has started flight tests of a prototype vehicle.

The Seattle-based company announced Sept. 25 that it performed an initial series of taxi tests of a prototype flight vehicle it calls PFV01 at an unidentified airport in Abu Dhabi in the United Arab Emirates. The tests included what it called “short hops” by the vehicle as it tested its handling characteristics for takeoff and landing.

PFV01 is designed to test the aerodynamics of the company’s proposed Radian One, a

spaceplane that would take off horizontally using a rail sled system more than three kilometers long and reach orbit using rocket engines before returning to a runway landing. The vehicle, as currently designed, could carry up to five people and 2,270 kilograms of cargo to low Earth orbit and return with up to 4,540 kilograms of cargo.

Radian has already done extensive computer modeling and wind tunnel testing of the design, said Livingston Holder, chief technology officer and co-founder, in an interview. "But, we wanted to get a system in the air to see if the analytical work done to date matches our predictions."

The runway tests, he said, confirmed those models. "It's an important step," he said, "validating that the analytical models that we're using match what we're seeing in real life."

The company performed the tests in Abu Dhabi with the support of an unnamed partner there. The airfield where the tests took place was a "good, permissive environment," Holder said, that gave the company access daily.

Radian largely avoided export control issues with doing the tests there since PFV01, powered by two jet engines, did not contain any space-specific technologies like rocket engines that would have been in the purview of the International Traffic in Arms Regulations (ITAR). "We're keeping this to the airplane side of things because the airplane part makes it easier from an ITAR standpoint," he said of the tests.

The next phase of testing will involve moving to another airfield in the region with a longer runway, enabling more sustained flights to test handling of the vehicle. "We've learned enough that we can start opening the envelope of performance," Holder said. He didn't provide a schedule for those tests, but those could involve the same PFV01 vehicle or a modified version to test different configurations.

Radian performed the PFV01 taxi tests while doing other work on the design of the spaceplane. That has included new tests of the thermal protection system the company has developed for the vehicle as well as production of a propellant test tank using composites.

"We're really pleased with how things have been going," Holder said of the overall work on the spaceplane, with no major surprises during development of its key technologies. "We're making predictable progress toward our end results."

Radian, which raised a $27.5 million seed round in early 2022, is working on its next funding round, but he said it was premature to discuss details about it. He said the company has had good discussions with undisclosed potential customers interested in the ability of the vehicle to take cargo both to orbit and back. That has included both signing letters of intent as well as converting those letters into contracts.

"It's one thing for a company to have an idea: this is what your product is going to do, how it's going to work, who it's going to be beneficial for," he said, "and then to try and find out, does the marketplace really believe what you believe? And the answer is, they do."

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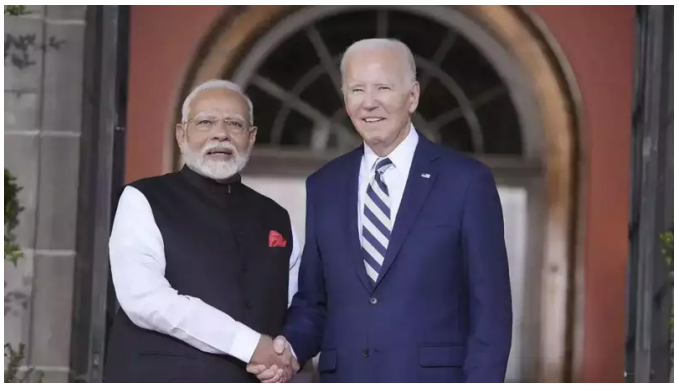
Global Aerospace Industry

US Space Force to help set up a Semiconductor Plant in India

22 Septmeber 2024

Source: Times of India | https://timesofindia.indiatimes.com/india/us-space-force-to-help-set-up-semiconductor-plant-in-india/articleshow/113573861.cms



PM Modi and President Joe Biden

NEW DELHI: India is set to establish its first national security semiconductor fabrication plant that will supply chips to the US armed forces, allied militaries, and Indian defense forces. The announcement follows a groundbreaking agreement between India and the United States, as detailed in the joint fact sheet released after the meeting between Prime Minister Narendra Modi (https://timesofindia.indiatimes.com/topic/narendra-modi) and President JoeBiden (https://timesofindia.indiatimes.com/topic/joe-biden) in Delaware.

"President Biden and Prime Minister Modi hailed a watershed arrangement to establish a new semiconductor fabrication plant focused on advanced sensing, communication, and power electronics for national security, next generation telecommunications, and green energy applications," according to the joint fact sheet released following the meeting read on Sunday.

"The fab, which will be established with the objective of manufacturing infrared, gallium nitride and silicon carbide semiconductors, will be enabled by support from the India Semiconductor Mission as well as a strategic technology partnership between Bharat Semi, 3rdiTech, and the US Space Force ," the fact sheet added.

The Leaders also commended the collaborative initiatives aimed at promoting resilient, secure, and sustainable semiconductor supply chains.

A notable example is GlobalFoundries' (GF) establishment of the GF Kolkata Power Center in Kolkata, which will strengthen mutually advantageous connections in chip manufacturing research and development, paving the way for groundbreaking advancements in zero and low emission vehicles, connected vehicles, internet of things devices, AI, and data centers.

The leaders also welcomed recent private sector collaborations in emerging technologies. IBM has recently signed memoranda of understanding with the Government of India, which will allow the deployment of IBM's watsonx platform on India's Airawat supercomputer.

This partnership will foster new AI innovation opportunities, enhance R&D collaboration on advanced semiconductor processors, and bolster support for India's National Quantum Mission.

Both the leaders expressed their appreciation for the advancements made following the signing of a Memorandum of

Understanding (MoU) in November 2023. The MoU, signed between the Commerce Department and the Ministry of Commerce and Industry, aims to strengthen the innovation ecosystems of both nations under the "Innovation Handshake" agenda.

“Since then, the two sides have convened two industry roundtables in the US and India to bring together startups, private equity and venture capital firms, corporate investment departments, and government officials to forge connections and to accelerate investment in innovation,” it added.

The leaders welcomed the progress toward the first joint NASA - ISRO mission to conduct scientific research aboard the International Space Station in 2025 and appreciated the initiatives and exchange of ideas under the Civil Space Joint Working Group and expressed hope that its next meeting in early 2025 will open additional avenues of cooperation. They pledged to pursue opportunities to deepen joint innovation and strategic collaborations, including by exploring new platforms in civil and commercial space domains."

Addressing a special briefing on PM Modi's visit to the US, foreign secretary Vikram Misri said, "India's emphasis is on minimizing conflict and division, leveraging democratic values even as we pursued development objectives, and highlighting the role of technology and the digital revolution in ushering in good governance, essentially to turn the disruptive features of technology to good ends."

These themes were reflected during the bilateral meetings in Delaware, according to the foreign secretary. Misri noted that technology was a central focus in both bilateral and plurilateral discussions, as highlighted in the Quad fact sheet and the joint statement with the United States.

"In the plurilateral meetings today, PM Modi underlined India's approach to cooperation, contact and engagement for growth with a variety of partners in the Indo-Pacific. It was striking to hear the other Quad leaders acknowledge India's actions," the foreign secretary added.

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Foreign Debuts, but Few Defence Deals at Singapore Air Show

Gerry Doyle | 23 February 2024

Source: Reuters | https://www.reuters.com/business/aerospace-defense/foreign-debuts-few-defence-deals-singapore-air-show-2024-02-23/#:~:text=SINGAPORE%2C%20Feb%2023%20(Reuters),major%20defence%20deals%20were%20scarce.

An Aviation Industry Corporation of China (AVIC) Z-10ME attack helicopter is displayed at the Singapore Airshow at Changi Exhibition Centre in Singapore February 22, 2024. REUTERS/Edgar Su/File Photo

SINGAPORE, Feb 23 (Reuters) - The Singapore Airshow included the foreign debuts

of new weapons systems, growing interest in systems that could destroy ballistic missiles and swat down drones - but it was missing any Russian presence and major defence deals were scarce.

The trade portion of Asia's biggest aviation gathering ended on Friday, with exhibitors packing up their sprawling displays of military hardware, aerospace services, parts and national pride.

After days of demonstration flights, Asian military acrobatic teams took a break on Friday, when no aerial displays were scheduled in advance of the public air show on Saturday and Sunday.

Unlike previous years, there were no Russian companies presenting their wares at the air show. With international sanctions hobbling business and the invasion of Ukraine sapping supplies, competitors said there were opportunities to step in with some Asian operators of Russian gear.

"In this region you have seen a shift away from Russian equipment already," said Robert Hewson of Sweden's Saab (SAABb.ST), opens new tab. "Of course there are some natural client countries... who stay where they are" in terms of suppliers.

Several Southeast Asian countries, including Malaysia, Indonesia, Vietnam, Cambodia and Laos, also use Russian-made or Soviet Union-vintage equipment, sometimes alongside Western-made gear. Russia's largest arms exporters did not respond to Reuters requests for comment.

Israel's defence industry made a quiet return after being largely absent from the Dubai air show in November in the wake of the Israel-Hamas war - a subject that the companies were reluctant to discuss.

IAI, Rafael, Elbit and the Israeli defence ministry all declined to comment on anything involving the war in Gaza, including the performance of their weapons.

The war wasn't brought up by delegates at the Singapore event and didn't dampen appetite for Israel's missiles, spy gear and aerial drones, two Israeli industry officials at the show told Reuters, asking not to be named because of the sensitivity of the matter.

Missiles, Helicopters

The barrage of anti-ship ballistic missiles in the Red Sea, meanwhile, led to an interest in systems that could not just protect against those threats, but also smaller, cheaper missiles and drones, attendees said.

On the sidelines of the air show, a senior executive at a U.S. defence contractor said the activity in the Red Sea by Yemen's Iran-aligned Houthis and in Ukraine had caught the attention of potential customers in Asia.

"What we're seeing is demand increase for integrated air and missile defence here," said the executive, who declined to be named because of the sensitivity of the matter. He said that included sensors to detect targets, the weapons to shoot them down and the command-and-control systems tying it all together.

Jeffrey Lewis, director of the East Asia

Nonproliferation Program at the Center for Nonproliferation Studies, said the cost of such systems might make it more economical - based on the experience in the Red Sea - to simply try to destroy the attacking weapons on the ground.

"At the end of the day, we turned to offensive systems to strike the launchers," he said. "That implies that defences are a very expensive niche capability. Why shoot the arrow when you can shoot the archer?"

U.S. Navy destroyers are equipped with the Aegis air defence system, with components from Lockheed Martin (LMT.N), opens new tab, among others, which is designed to shoot down aircraft, cruise missiles and ballistic missiles.

Aegis uses RTX (RTX.N), opens new tab subsidiary Raytheon's SM-2, SM-3 and SM-6 missiles to intercept threats. A Raytheon spokesperson declined to comment on whether the company had seen increased interest in missile defence systems since the Houthi attacks began. A Lockheed Martin spokesperson provided public information about increased production of certain systems.

Among the notable weapon systems on display at the show was the Z-10 attack helicopter, made by China's AVIC, which made its first trip outside Chinese territory in Singapore.

China hopes to export the helicopter. Experts and attendees said the number of potential customers might be small in Asia.

"The performance and capabilities of this platform would certainly make it of interest for export," said Malcolm Davis, a senior analyst at the Australian Strategic Policy Institute. He named Laos, Cambodia and Myanmar as possible buyers.

Although several commercial deals were announced at the air show, and "sustainability" was a buzzword throughout, the defence side of the show ended quietly, with discussion of hopes for future sales but no big announcements.

Still, many attendees came away optimistic, with Boeing saying it had seen "substantive customer engagements" with its defence portfolio.

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India and US Poised to Seal $3.1 Billion MQ-9B Predator Drone Deal before October End

10 September 24

Source: Economic Times | https://economictimes.indiatimes.com/news/defence/india-and-us-poised-to-seal-3-1-billion-mq-9b-predator-drone-deal-before-october-end/articleshow/113220129.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst

MQ-9B Predator drone

The Indian Defence Ministry is progressing with a significant acquisition of Predator drones from US-based General Atomics, following approval from the Defence Acquisition Council

(DAC) on July 30, according to a Hindustan Times report. The deal, valued at approximately $3.1 billion, is now pending expenditure approval from the Finance Ministry and final authorization from the Cabinet Committee on Security (CCS). The acquisition must be completed by October 31 to avoid potential price increases ..

Details of the Predator Drone Acquisition

India plans to purchase 31 MQ-9B Predator drones, each equipped with air-to-surface missiles and laser-guided bombs. Of these, 16 drones will enhance the Indian Navy's maritime security operations, eight will be assigned to the Indian Army, and the remaining eight will support the Indian Air Force. The deal marks a strategic enhancement of India's defense capabilities across maritime and land operations.

The Indian forces aim to induct 10 MQ-9B drones as soon as possible, with the remaining drones to be delivered in batches every six months. The Navy's MQ-9Bs will be stationed at command and control centers in Arakkonam and Porbandar, close to the coastline. The drones allocated to the Army and Air Force will focus on monitoring the Line of Actual Control (LAC).

During a visit to the US in August, Defence Minister Rajnath Singh received a detailed briefing on the Predator drone's capabilities from General Atomics. The Predator drones have a proven track record of precision strikes in the Middle East and Afghanistan, targeting high-value assets effectively.

Currently, India is utilizing two Sea Guardian drones, which are the unarmed variants of the Predator, on lease from General Atomics for maritime surveillance. Although the lease was set to expire in January 2024, the Indian Navy has extended it for an additional four years. These drones offer real-time maritime domain awareness, covering critical areas from the Sunda Straits in Indonesia to the Suez Canal and the southern Indian Ocean.

Why India is Buying Predator Drones

The decision to acquire armed drones has become more urgent due to the increasing use of such technology in global conflicts, including Ukraine and Gaza. Non-state actors like the Houthis and Hezbollah have also begun deploying drones in their operations. Additionally, China and Pakistan currently operate weaponized drones, with Beijing supplying such platforms to Islamabad. This acquisition reflects India's strategic response to the evolving landscape ..

This deal represents a significant step in enhancing India's defense infrastructure and addressing the growing importance of unmanned aerial systems in contemporary conflicts.

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MQ-9B Predator Drone Crashes after Technical Failure at Sea off Chennai

18 September 2024

Source: ANI News | https://www.aninews.in/news/national/general-news/mq-9b-predator-drone-crashes-after-technical-failure-at-sea-off-chennai20240918221446/

MQ-9B Predator drone crashes after technical failure at sea off Chennai

Arakkonam (Chennai) [India], September 18 (ANI): The Indian Navy said that a MQ-9B Predator High Altitude Long Endurance Remotely Piloted Aircraft (HALERPA) encountered a technical failure on Wednesday, afterwhich the aircraft was navigated to a safe area over the sea and carried out a controlled ditching at sea off Chennai.

"A High Altitude Long Endurance Remotely Piloted Aircraft (HALERPA) leased by the Indian Navy operating from INS Rajali, Arakonnam (near Chennai) encountered a technical failure at about 1400 hrs whilst on a routine surveillance mission which could not be reset in flight," the Ministry of Defence said.

Later, the aircraft was navigated to a safe area over the sea and carried out a controlled ditching at sea off Chennai, it stated.

"A detailed report has been sought from the Original Equipment Manufacturer (OEM)," it added.

"The MQ-9B Predator drones (HALERPA) flying for the Indian Navy are operated by General Atomics under a lease agreement between the Indian Navy and the American firm. The Indian side pays only for the services provided by the vendor and the drones are flown by the pilots from the vendor side. The Indian side has asked for a detailed report from the vendors on the accident," Navy officials said. (ANI)

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Indian Aerospace Industry

Dassault Aviation to Set up a Maintenance Facility in India for Indian Air Force's Rafale and Mirage-2000 Fighter Jets

Ujjwal Shrotryia | 03 July 2024

Source: Swarajya | https://swarajyamag.com/defence/dassault-aviation-to-set-up-a-maintenance-facility-in-india-for-indian-air-forces-rafale-and-mirage-2000-fighter-jets

A Rafale fighter of the Indian Air Force. (Twitter)

France's Dassault Aviation, the manufacturer of Rafale and Mirage 2000 fighter jets, wants to establish a maintenance, repair and overhaul

(MRO) facility in India.

This MRO facility will allow the Indian Air Force (IAF) to repair its Mirage 2000 and Rafale jets locally in India. The Indian Navy's Rafale-M jets will also be repaired at this facility.

The MRO facility will be located near Jewar International Airport in Noida, Uttar Pradesh, and Dassault Aviation is in the process of acquiring land near the international airport.

The IAF already operates 36 Rafale jets, which were bought in 2016. These jets are India's most technologically advanced jets.

The Indian Navy is also looking to buy 26 of these jets worth $5 billion. A negotiating team for deciding the final price of these jets was earlier in India.

Dassault is also in the race to sell 114 fighter jets to IAF under the multi-role fighter aircraft (MRFA) contest.

The MRO facility at Jewar will also overhaul older Mirage 2000 jets in India, for which India is going to several countries to acquire older airframes for cannibalisation.

Safran, the manufacturer of M-88 engines for Dassault Rafale, is also planning another MRO facility in Hyderabad, which is expected to be operational by 2025. Safran has also committed to making these engines entirely in India if large numbers of Rafales are ordered.

Safran is also tying up with Hindustan Aeronautics Limited (HAL) to design, develop and manufacture a turboshaft engine to power the Indian Multi-role Helicopter (IMRH) and Deck-Based Multi-role Helicopter (DB-MRH).

These new MRO facilities also pave the way for the production of Rafale fighters and their components in India if Dassault wins the MRFA competition.

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India Orders Hundreds of New Engines for Su-30MKI Fighters

Gordon Arthur | 17 September 2024

Source: Defense News | https://www.defensenews.com/global/asia-pacific/2024/09/17/india-orders-hundreds-of-new-engines-for-su-30mki-fighters/

An Indian Air Force Su-30MKI fighter takes off from Darwin during Exercise Pitch Black 2024. (Gordon Arthur)

CHRISTCHURCH, New Zealand — The backbone of India's fighter jet fleet is the Russian-designed Sukhoi Su-30MKI, and the country recently ordered 240 engines to keep the fleet airborne for years to come.

Following approval by the Cabinet Committee on Security earlier this month, officials signed a deal with state-owned Hindustan Aeronautics Limited (HAL) to supply the so-called AL-31FP engines.

The contract, worth more than 260 billion rupees or US$3.1 billion, will see the first engine handed over to the Indian Air Force (IAF) after a year. All will be delivered within eight years, according to a Ministry of Defence statement, with production of 30 annually.

Made by HAL under Russian license, the engines currently feature local content of 54%. However, the company plans to boost the ratio to 63% by tapping India's defense manufacturing ecosystem. "This would also increase the indigenous content of repair and overhaul tasks of the aero engines," said the ministry.

It further stated, "These aero engines will be manufactured by the Koraput Division of HAL, and are expected to fulfill the needs of the Indian Air Force to sustain the operational capability of the Su-30 fleet for the defense preparedness of the country."

Notably, India chose to stick with AL-31FP engines, even as Russia is upgrading its Su-30SM fighters with the newer and more powerful AL-41FS.

Incidentally, the IAF is buying twelve new Su-30MKIs from HAL for $1.3 billion to make up for losses. This purchase was approved in September 2023.

The air service has approximately 260 Su-30MKIs, six of which traveled to Exercise Pitch Black 2024 in Australia in July. The Indian detachment commander, Group Captain Ajay Rathi, praised the platform: "With its advanced avionics, thrust vectoring and superior payload capacity, the aircraft is capable of undertaking offensive and defensive missions, to execute strategic and tactical operations."

He described its key capabilities as its long range, maneuverability, firepower and effectiveness in contested environments.

Last November, India's Defence Acquisition Council signed off on a major upgrade program for 84 Su-30MKIs. HAL Chairman and Managing Director C.B. Ananthakrishnan subsequently told The Economic Times: "The upgrade will see significant private-sector participation, with HAL as the lead integrator."

Air Chief Marshal Vivek Ram Chaudhari, the Air Force's top officer, said the project would upgrade 51 aircraft systems, with 78% of the content being indigenous. HAL is responsible for 30 elements, while the private sector will upgrade eight systems.

Once implemented, the upgrade will include installation of the Virupaksha active electronically scanned array radar, a new electronic-warfare system, and a domestic infrared search and track system.

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HAL Beats Global Rivals As Nigerian Army Is Set To Seal Historic Deal For Its Light Combat Helicopter Prachand

18 September 2024

Source: The Week | https://www.theweek.in/news/defence/2024/09/18/hal-beats-global-rivals-as-nigerian-army-is-set-to-seal-historic-deal-for-its-light-combat-helicopter-prachand.html

Nigeria may soon become the first country to import light combat helicopter (LCH) Prachand, designed and manufactured by Hindustan Aeronautics Limited (HAL).

According to media reports, discussions between Nigerian officials and HAL over procuring India's first indigenous multi-role light attack helicopter are nearing completion, and an agreement regarding this is likely soon.

Financial Express reports that Nigeria is looking to purchase four combat helicopters through a soft credit agreement. An announcement regarding this will be made soon, reported EurAsian Times.

If HAL gets the deal, it would have beaten Turkish T-129 ATAK helicopter and Airbus' Tiger HAD multi-role attack helicopter as these were the other options before Nigeria.

Earlier, officers of the Nigerian Army were trained on HAL's a twin-engine, multi-mission Dhruv helicopters.

About Prachand LCH

Based on the Dhruv helicopter, Prachand is a two-seater anti-infantry and anti-armour helicopter. It is capable of precisely hitting targets at high altitudes and can also be used for bunker-busting operations at high altitudes.

Designed and developed in response to the operational needs identified during the Kargil War in 1999, the first prototype of HAL Prachand made its maiden flight in 2010.

The aircraft, powered by two HAL/ Turbomeca Shakti turboshaft engines, features advanced avionics and a design that allows it to operate effectively in challenging environments, including high altitudes up to 5,000 meters.

Prachand LCH features advanced electronic warfare capabilities and cutting-edge weaponry, including chin-mounted and twin-barrel M621 20mm cannon, FZ231 rocket launcher built by Forges de Zeebrugge and is equipped with air-to-air, air-to-surface, and anti-radiation missiles.

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ISRO, IN-SPACe & NSIL Sign Five Tech Transfer Pact with Non-Governmental Entities

29 August 2024

Source: Economic Times | https://economictimes.indiatimes.com/news/science/isro-in-space-nsil-sign-five-tech-transfer-pact-with-non-governmental-entities/articleshow/113529628.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst

Indian Space Research Organisation

Indian Space Research Organisation (ISRO), Indian National Space Promotion and Authorization Centre (IN-SPACe) and NewSpace India Limited (NSIL) signed five Technology Transfer Agreements (TTA) with non-governmental Entities on Friday. According to a press statement issued by IN-SPACe, with the five TTAs signed, the total number of agreements signed post space reforms stands at 75.

Pawan Goenka, Chairman, IN-SPACe said, "The milestone of achieving 75 TTAs marks a significant step forward in empowering India's space private sector to harness cutting-edge space technologies for not just commercial applications, but also applications beneficial to society."

He further said ISRO, IN-SPACe and NSIL will continue to focus on enabling greater participation, fostering new ventures, and strengthening India's position in the global space ecosystem.

The companies that signed the TTAs today were Anabond Ltd, Salvo Industries Pvt Ltd, Micropack Pvt Ltd, and Astra Microwave Products Ltd, stated the release.

The TTAs aim to give private players the opportunity to access the developed technologies available with ISRO, enabling them to use space-related technology for commercial applications in space as well as other sectors such as agriculture, energy, infrastructure, defence, telecommunications, and cybersecurity, added the statement.

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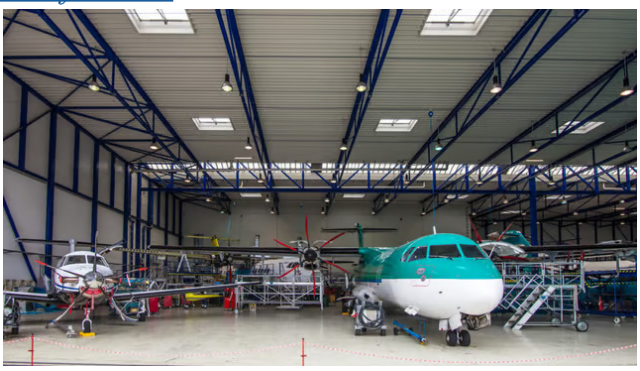
Efforts on to Make India a Global Aviation Hub, Manufacture Aircraft: Naidu

12 September 2024

Source: Outlook Business | https://www.outlookbusiness.com/news/efforts-on-to-make-india-a-global-aviation-hub-manufacture-aircraft-naidu



Aircraft Manufacturing

Highlighting the aviation sector's growth potential, Union minister K Rammohan Naidu on Wednesday said efforts are on to make

India a global aviation hub as well as to start manufacturing aircraft in the country.

With Asia-Pacific region poised to lead global aviation growth, Naidu said strategic investments in infrastructure and collaboration amongst the regional stakeholders is critical to achieving sustainable growth across the sector.

Speaking at the second Asia Pacific Ministerial Conference on Civil Aviation in the national capital, Naidu emphasised on three elements -- infrastructure, integration and innovation -- for the sector's growth.

"My ministry is working with the vision of establishing a seamless aviation landscape in the country, integrating helicopters and seaplane operations alongside wide-body aircraft under the regional connectivity scheme UDAN," he noted.

India is one of the world's fastest growing civil aviation markets and the fleet size of domestic carriers has increased to around 800 from 400 in 2014 while the number of domestic passengers climbed from 67 million to 152 million during the same period.

The number of operational airports have grown from 74 in 2014 to 157. "We have an ambitious plan of scaling this up to 350-400 airports by 2047," the civil aviation minister said.

The country is also well-positioned to offer cost-effective and high quality MRO (Maintenance, Repair and Overhaul) services to domestic and international airlines, he noted.

According to him, the government is looking at ways to boost indigenous production capabilities and also start manufacturing aircraft in the country.

While noting that the aviation industry has long been recognised as a significant contributor to global carbon emissions, the minister said India is promoting adoption of Sustainable Aviation Fuel (SAF).

"The target is to blend 1 per cent of sustainable aviation fuel with jet fuel in 2027, 2 per cent in 2028 and 5 per cent by 2030 for all international flights," he added.

Around 250 representatives from 41 countries are expected to participate in the two-day conference that began on Wednesday.

Naidu was also elected as the Chairman of Asia Pacific Ministerial Conference on Civil Aviation.

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Technology & Innovation

Indian Air Force Pilot Sqn Ldr SS Bhatkare Develops AI-Driven Aircraft Inspection System

15 September 2024

Source: Economic Times | https://economictimes.indiatimes.com/news/defence/indian-air-force-pilot-sqn-ldr-ss-bhatkare-develops-ai-driven-aircraft-inspection-system/articleshow/113361864.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst

Indian Air Force pilot Sqn Ldr SS Bhatkare develops AI-driven aircraft inspection system

Indian Air Force pilot Squadron Leader Bhatkare has developed an AI-driven aircraft inspection system to reduce accidents caused by human errors. This innovation aims to detect damages on aircraft panels, gauges, and covers. Defence Minister Rajnath Singh praised the move towards self-reliance in India's defence sector during the 'Tarang Shakti 2024' exercise.

Indian Air Force MCC's SU-30 MKI pilot Squadron Leader Bhatkare has developed an AI-driven aircraft inspection system. The newly developed facility will help in reducing the accidents that earlier used to happen due to human errors.

"From injury to innovation, meet @IAF_MCC's SU-30 MKI pilot, Sqn Ldr SS Bhatkare. Fueled by the vision of #AatmanirbharBharat, he has defied the odds to develop a cutting-edge, AI-driven aircraft inspection system. Discover how his pioneering work is enhancing safety for fellow aviators," the Ministry of Defence posted on X.

Squadron Leader Bhatkare shared more details about his innovation. "Since 3-5 years, there has been a lot of promotion given to startups and innovations and make things in India itself. That motivated me. I thought I would also innovate something. I have created this innovation of detecting aircraft panels, gauges, and covers. First of all, an inspection of aircraft needs to be done to try to find out if there is any damage. Sometimes the pilot is tired, or because of human error, it can happen that they miss out on certain things. A camera system will be developed that can scan the entire service of aircraft. This will be able to reduce the accidents that happen because of human errors," he said in the video posted by the Ministry of Defence.

Earlier on Thursday, Defence Minister Rajnath Singh attended the multilateral aerial exercise 'Tarang Shakti 2024'. He stated that the Indian Air Force and defence sector are moving ahead rapidly with the resolution of self-reliant India.

He added that India's defence sector has taken strong steps towards indigenisation in the manufacture of weapons, platforms, and aircraft. India has become self-sufficient to

a large extent in things like Light Combat Aircraft, Sensors, Radars and Electronic warfare. He further stated that we are constantly striving to move ahead in these areas.

The multilateral aerial exercise 'Tarang Shakti 2024' also showcased the display of Surya Kiran aircraft and Tarang helicopters. 'Tarang Shakti' has been organised in two phases. Its first phase was organised in Sulur, while its second phase was organised in Jodhpur.

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Frying Pan-Sized Detector could Track US Stealth Fighters Using Starlink, Claims China

Christopher McFadden | 16 September 2024

Source: Interesting Engineering | https://interestingengineering.com/innovation/china-starlink-detect-stealth-fighters

Image of a SpaceX Starlink constellation captured at night.

Chinese researchers have found an innovative way to use SpaceX Starlink satellite constellations to detect aircraft, like stealth fighters, passively. According to Chinese media, this was achieved by effectively detecting the "shadow" of an object between the detector and the electromagnetic radiation emitted by the satellites.

The team behind the discovery reportedly used a DJI Phantom 4 Pro drone to simulate a stealth fighter and conduct their experiment to achieve this. This drone was chosen as it has roughly the same radar cross-section as something like an American F-22.

If true, the experiment, conducted off the coast of Guangdong in the South China Sea, could revolutionize stealth aircraft detection. The Chinese government's State Radio Monitoring Centre oversaw the experiment, and the results were peer-reviewed before publication.

Stealth aircraft, like the F-22, are designed to reduce radar reflection through clever geometric shapes and radar-absorbing paints. This combination of technologies reduces the "size" of the objects on radar equipment, hopefully masking their true nature.

Starlink to Find Stealth Aircraft

The basic idea is that when an aircraft flies through the space between Starlink satellites and ground antennas, it can cause forward scattering of the satellites' electromagnetic waves, which can disrupt normal communication signals.

The team found that if this scatter can be detected and analyzed, it can be used to detect and potentially track stealth aircraft. Interestingly, Russian scientists initially suggested using forward scatter to detect drones at an international academic conference in 2015.

Starlink wasn't launched until 2019. Today, SpaceX has constructed a massive constellation comprising over 6,000 satellites.

The Starlink signals are encrypted, and

SpaceX CEO Elon Musk does not offer services to users in China. Yi's team claims they can construct a Starlink receiver using affordable, easily obtainable electronic components.

The antenna is mounted on a rotatable base, enabling it to track the satellite as it moves across the sky. Starlink satellites emit high-frequency radio signals to provide internet connections with speeds of up to 220Mbps.

However, this complex electromagnetic environment was not a consideration when stealth fighters were first developed. According to a research team, if a radar station utilizes strong and widespread Starlink satellite signals, its detection capabilities could be unaffected by the target's three-dimensional shape and surface material.

Not Ready for Militarization

Yi and his team revised the forward scatter radar detection model after thoroughly examining the fundamental physical mechanisms and developing a new algorithm. They processed the received signals using an undisclosed high-performance chip.

Currently, their radar antenna is only the size of a frying pan, and the drones in the experiment flew at relatively low altitudes. Therefore, the new technology can not yet be used for military applications.

Yi's team claims to have successfully detected signals corresponding to detailed features such as drone rotor movement, confirming the "feasibility and effectiveness" of the method and system design in anti-drone and stealth fighter applications.

The team explained that this will "provide significant advantages in detecting small and stealth targets." "Using third-party radiation sources, radar systems can have improved concealment and anti-jamming capabilities," Yi and his colleagues added.

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"The term 'Aerospace' was introduced in 1958 by the USAF Chief of Staff, General Thomas D White, as a new construct that depicted air and space as a seamless continuum stretching from the Earth's surface to infinity."

The Centre for Air Power Studies (CAPS) is an independent, non-profit think tank that undertakes and promotes policy-related research, study and discussion on defence and military issues, trends and developments in air power and space for civil and military purposes, as also related issues of national security. The Centre is headed by Air Vice Marshal Anil Golani (Retd).

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