जुलाई
July
2023

खंड/Vol. : 48 अंक/Issue : 134
18/07/2023

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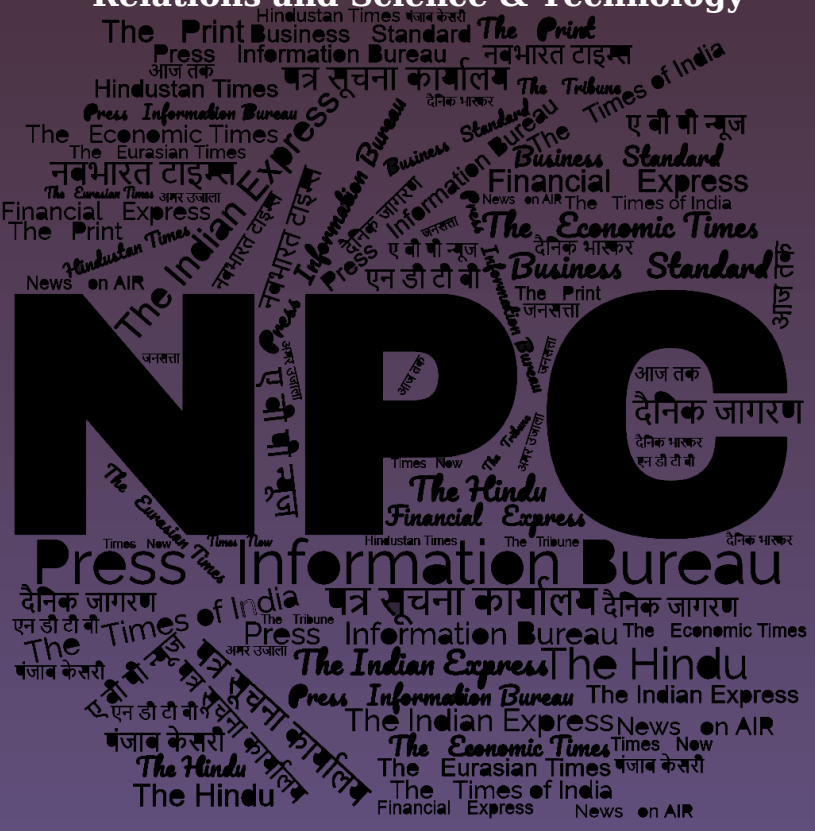

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Tue, 18 Jul 2023

INS Sahyadri and INS Kolkata to Jakarta, Indonesia

Two frontline Indian Naval ships INS Sahyadri and INS Kolkata, mission deployed in South Eastern IOR, arrived in Jakarta on 17 July 2023. The ships were accorded a warm welcome by the Indonesian Navy.

During the port call, personnel from Indian and Indonesian navies will engage in a wide range of professional interactions, joint yoga sessions, sports fixtures and cross-deck visits, aimed at strengthening mutual cooperation and understanding between the two navies.

Upon completion of the operational turnaround, the two ships will also participate in a Maritime Partnership Exercise (MPX) at sea with the Indonesian Navy towards further bolstering the high degree of interoperability that already exists between the two navies.

INS Sahyadri is the third indigenously designed and built Project-17 class stealth frigate and INS Kolkata is the first indigenously designed and built stealth destroyer of the Project-15A class. Both the ships have been built at Mazagon Dock Shipbuilders Ltd, Mumbai.

https://pib.gov.in/PressReleasePage.aspx?PRID=1940405

R. REPUBLICWORLD.COM

Tue, 18 Jul 2023

India to Acquire Rs 10,000 Cr 'Made-in-India' Drones for Border Surveillance

Indian Defence forces are bolstering the nation's border surveillance capabilities along China and Pakistan borders with the procurement of 97 drones under the 'Make-in-India' project, valued at over Rs 10,000 crore, according to reports.

This significant decision aligns with India's recent acquisition of 31 MQ-9B Reaper drones from the United States, showcasing the nation's commitment to enhancing aerial surveillance and Unmanned Combat capabilities. During the Defence Acquisition Council Meet on June 15,

discussions also encompassed the procurement of drones of a similar class, like the Reaper, from domestic vendors, further emphasising the country's focus on strengthening its defence capabilities.

3 Things you should know

India to procure 97 drones worth Rs 10,000 crore for border surveillance and Unmanned Combat capabilities.

Indian Air Force to lead the acquisition; TAPAS UAV shows promising potential.

Project Cheetah: Upgrading Heron UAVs with enhanced strike capabilities for improved targeting.

Medium Altitude Long Endurance requirement

The decision to acquire 97 highly capable drones was based on “a scientific study” carried out “jointly” by the defence forces. These drones are intended to meet the Medium Altitude Long Endurance (MALE) requirements and will play a crucial role in monitoring both land and sea regions. These unmanned aerial vehicles (UAVs) are designed to fly for close to 30 hours continuously, making them highly efficient for surveillance operations.

Indian air force to lead the procurement

According to government sources, the Indian Air Force (IAF) will be the lead service responsible for the procurement of these drones, indicating its significance in enhancing India's aerial surveillance capabilities. The IAF is set to receive the highest number of drones among all three defence forces.

Tapas to be the top-contender

Among the potential acquisitions that could be made under the 'Make-in-India' project, the TAPAS UAV is the leading contender. The indigenous TAPAS UAV, also known as Rustom-II, recently achieved a significant milestone when it demonstrated its capabilities to the tri-services team for the first time on 27th June 2023 at ATR Chitradurga in Karnataka. The successful demonstration earned praise from the Defence Research and Development Organisation (DRDO) and the Indian Navy. As a result, the TAPAS UAV is now deemed ready for user evaluation trials, marking a crucial step in its potential integration into the Indian Defence forces' fleet.

Project Cheetah: Weaponization of Israeli drones

The defence forces have also acquired over 46 Heron UAVs over the years, and now they intend to complement this existing fleet with an additional 97 drones. Hindustan Aeronautics Limited, in collaboration with original equipment manufacturers, will be responsible for upgrading the drones that are already in service. This upgradation follows the 'Make-in-India' approach, with a mandate that over 60 percent of Indian content must be utilised in the process.

Part of these upgrades is the Indian Air Force's "Project Cheetah," a program aimed at enhancing the Israeli Heron drones by equipping them with enhanced strike capabilities and implementing other minor upgrades to their fuselage. This ambitious project entails modernising the existing fleet of Israeli-origin Heron UAVs, incorporating advanced communication facilities and missile systems, thus significantly enhancing their effectiveness in targeting enemy positions. Notably, India had received a couple of these drones during the peak of Indo-China tensions, and they were successfully deployed along the LAC, Line of Actual Control.

Upgraded surveillance and reconnaissance pods

The upgraded surveillance capabilities of the drones will provide the forces on the ground with precise intelligence about potential hideouts in operational areas. Moreover, the ground stations will be able to control these aircraft from distant locations through a satellite communication system, enhancing their operational flexibility.

Pakistan and China already possess an array of unmanned combat vehicles, and recently, Pakistan acquired Turkish drones, including the now-renowned Bayraktar TB2 and Akinci drones. Similarly, China has established a drone manufacturing industry that has produced and demonstrated products equivalent to top-tier Western drones, such as the WZ-7 Soaring Dragon or the WZ8 drone, which was first displayed at the Zuhai airshow back in 2019. In light of these developments, the procurement of more armed drones becomes crucial for the Indian Armed Forces.

https://www.republicworld.com/india-news/general-news/indian-to-acquire-rs-10000-cr-made-in-india-drones-for-border-surveillance-articleshow.html

THE HINDU

Mon, 17 Jul 2023

Naval Group Working on Qualifying DRDO-Developed Air Independent Propulsion System for Installation on Scorpenes

As India begins negotiations with France for three more Scorpene-class submarines, Naval Group has already invested over ₹100 crore for three workshops for maintenance of critical systems of Scorpene submarines which have the tools and infrastructure for important tasks and also stocking spares and is also working on qualifying the Defence Research and Development Organisation-developed (DRDO) Air Independent Propulsion (AIP) system for installation on the Scorpenes.

Naval Group and Mazagon Dock Limited (MDL), Mumbai, signed a Memorandum of Understanding (MoU) for cooperation on three additional Scorpenes on July 6.

“The details of technical features and other parameters, including delivery lead time, will be complied with the MDL as per the requirements of the Indian Navy. Industrial partners, both French and Indian, will provide all necessary support,” Pierre Éric Pommellet, Naval Group Chairman and Chief Executive Officer, told The Hindu.

On July 13, as Prime Minister Narendra Modi was entourage to Paris, the Defence Acquisition Council (DAC) chaired by Defence Minister Rajnath Singh accorded Acceptance of Necessity (AoN) for the procurement of 26 Rafale-M fighters and three additional Scorpene-class diesel-electric submarines for the Navy from France.

The DAC granted the AoN for procurement of three additional Scorpene submarines under Buy (Indian) category which will be constructed by the MDL and has higher indigenous content, the Ministry had stated.

The three additional Scorpene submarines will also come fitted with the DRDO-developed AIP system to enhance their endurance. “Further, the indigenous content will be higher as several efforts are in place in areas of DRDO AIP, combat system among others. We are assisting the DRDO to integrate their AIP and other indigenous technologies on-board Scorpene designed submarines,” Mr. Pommellet said.

Indigenous AIP module

The Navy has drawn up plans to install Air Independent Propulsion (AIP) modules on all Scorpene submarines as they go for their refit beginning with INS Kalvari likely by end next year to enhance their endurance. The indigenous AIP module has been tested on shore and recently DRDO and Naval Group signed an agreement to integrate the AIP module on the Scorpene.

"We are actively supporting the DRDO in qualifying indigenous supplier of liquid oxygen tank and preparation of the future stage of "jumboisation" [making the new hull, integrate safely the AIP, cut the submarine and join it with new AIP section] during submarine's normal refit," Mr. Pommellet said. In addition to submarines, Naval Group has signed MoUs with Hindustan Shipyard Limited, Visakhapatnam to support their bid for the Navy's Landing Platform Dock (LPD) ships and with Larsen and Toubro (L&T) to support their midget submarine development.

The Indo-French joint statement issued on July 14 hailed the success of the first Scorpene submarine construction programme and the sharing of naval expertise between companies in the two countries and added, "India and France are ready to explore more ambitious projects to develop the Indian submarine fleet and its performance."

Six Scorpene submarines are being built under Project-75 by the MDL under technology transfer from Naval Group under a $3.75 bn deal signed in October 2005 and is almost complete. The first submarine INS Kalvari was commissioned in December 2017, second submarine INS Khanderi in September 2019, third one INS Karanj in March 2021 and the fourth one INS Vela joined service in November 2021. "The 6th submarine, Vagsheer, is undergoing trial phases and we expect it to be delivered by early 2024", Mr. Pommellet added.

The Navy currently has 16 conventional submarines in service. They include seven Russian Kilo-class submarines, four German HDW submarines, five Scorpene-class submarines. With delays in submarine induction, the SSKs - 209s (German HDWs) and EKMs (Russian Kilo's), are being put through the Medium Refit Life Certification (MRLC) process which will give them additional life of 10 to 15 years, as reported earlier.

https://www.thehindu.com/news/national/naval-group-working-on-qualifying-drdo-developed-air-independent-propulsion-system-for-installation-on-scorpenes/article67091237.ece

FINANCIAL EXPRESS
Read to Lead

Mon, 17 Jul 2023

Safran Secures India's AMCA Jet Engine Contract amid Rolls Royce & BAE Systems Corruption Scandal

Following the Rolls Royce corruption scandal that threatened to destabilise India's defence industry, French firm Safran has been selected over UK's Rolls Royce for the Advanced Medium Combat Aircraft (AMCA) engine.

In May 2023, India's Central Bureau of Investigation (CBI) implicated Rolls Royce India Private Limited and BAE Systems in an alleged scheme to defraud the Government of India during the procurement of Hawk Aircraft. This led to severe concerns about India's defence procurement processes and cast a harsh light on the roles foreign companies play in the nation's defence sector.

Such a scandal had the potential to sway the decision for India's next-generation AMCA project, which was in need of a new engine. It was understood that Rolls Royce was in close competition with Safran, the French engine maker. However, the recent allegations significantly influenced India's decision, tilting it in Safran's favour.

The procurement of Hawk aircraft was intended to modernise the Indian Air Force (IAF) and bolster its domestic aerospace industry, making this scandal's impact potentially far-reaching. Repercussions may even alter relations with principal foreign suppliers.

While Rolls Royce and BAE Systems have pledged to cooperate with the Indian authorities and maintain their commitment to high ethical standards, Safran has emerged as the clear choice. The company, having thus far avoided such controversies, has strengthened its position in the Indian defence sector.

Safran's engines already power several aircraft within the Indian military, and their selection for the AMCA project reinforces their standing. This decision is expected to not only shape the immediate future of India's AMCA project but also potentially redefine the contours of India's defence procurement landscape.

https://www.financialexpress.com/business/defence-safran-secures-indias-amca-jet-engine-contract-amid-rolls-royce-bae-systems-corruption-scandal-3174842/

The Tribune

Tue, 18 Jul 2023

Engine Deals with France, US are for Separate Jets

The simultaneous discussions that India is having with the US and France for the production of engines for fighter jets are for separate requirements that, as per officials, won't overlap.

The US-origin General Electric (GE) F414 engine is for immediate needs. The Bengaluru-headquartered plane manufacturer Hindustan Aeronautics Limited (HAL) is set to ramp up the production of its light combat aircraft Tejas.

The Ministry of Defence (MoD) had last month given permission to start testing the prototype of the Tejas Mark-2 jet. GE has already supplied eight engines for the testing process. The deal with the US has been sealed and the two sides have agreed on the level of transfer of technology to India.

GE and HAL last month announced a memorandum of understanding to produce engines for fighter jets. The announcement had come during PM Narendra Modi's visit to the US. In the case of co-production of French-origin Safran engine, the project is about making a new engine that is aimed to be more powerful than anything being used anywhere in the world, for now. A roadmap for the project is being prepared by Safran and the DRDO and is expected to be ready before the year-end. The engine, 110 kilo newton thrust, is expected to roll out some 10 years down the line.

Sources said the US engine could be put on as many as 360 jets scheduled to be made in India over the next about 15 years. The GE F414 engine will be used in Tejas Mark-2 jets. Some 120 of these planes are to be made by HAL. The engine is also to be used for the deck-based fighters for the Indian Navy—some 100 such planes have been planned. The same engine is also expected on the advanced medium combat aircraft (AMCA), Mark-1, some 40 of these are expected.

Another 80-odd AMCA Mark-2 jets are planned and the more powerful engine is needed for this. The Safran-DRDO project is expected to deliver the 110 kilo newton engine. The US firm has promised that "GE will continue to collaborate with Indian government on the AMCA Mark-2 engine programme".

https://www.tribuneindia.com/news/nation/engine-deals-with-france-us-are-for-separate-jets-526548

FINANCIAL EXPRESS
Read to Lead

Mon, 17 Jul 2023

Fighter Jet Engine: How India is Filling Gaps in Critical Materials, Core-Technology

By Manish Kumar Jha

With the rocketing success of the Indian space programme—as advanced among the world's top 4 space entities—which is driven by Indian Space Research Organisation (ISRO), the question is often being raised in comparison to military aerospace projects. Straight away, the questions hint at the development of fighter jets and to be specific the jet engine. While the LCA Tejas did succeed with 4+ generation capabilities, it failed to develop a viable and functional jet engine, beginning with the Kaveri engine.

In fact, it is the jet engine that is still defined as the most complex technological feat in the era of artificial intelligence and machine learning. That is now set to change as the government strived to fill that technological void. The radical approach and importance that the government adopted, led to two leading global engine makers joining hands with India.

The recent talks with world-leading original engine manufacturer (OEM) Safran is a defining moment which actually lays the foundation of a new jet engine with best of class thrust ratio to power next-generation (5+) fighter jets.

However, it is important to understand what is actually needed to develop a jet engine which could power India's highly ambitious programmes like Advanced Medium Combat Aircraft (AMCA), Multi-Role Fighter Aircraft (MRFA) and possibly Tejas Mk2.

The technological gaps are well understood now as India learnt during the development stage of the Kaveri engine, which was sanctioned in 1989 for LCA Tejas.

Propulsion technologies

The jet engine is fundamentally all about the three highly complex core elements – advanced materials and process technology, combustion technology and Computational Fluid Dynamics (CFD) in engine design procedures.

Worldwide, all gas turbine engines have now improved turbine inlet temperature and compressor pressure ratio. The core functional aspect of the turbine has been transformed with a greater bypass ratio and nacelle performance which also boosts emissions.

The Kaveri turbofan engine faced thrust deficit performance at high altitudes, excessive weight and a "mysterious noise". The noise that emanates from the excessive heat in the core could not be rectified but that corresponded to the material within.

The material in question is the superalloys which can withstand combustion heat beyond 1,800°C. To generate 110-kN wet and 75-kN dry thrust aimed at new engines for Indian fighter jets, the higher heat- resistance materials were needed. And that is about finding high-temperature materials-mix and technology to process it for jet engine. Mostly, silicon carbide (SiC) and ceramic matrix composite systems are the proven ones for jet engines which India lacked. Besides, ceramic matrix composite materials are a choice for aerospace structural parts, which are largely utilized by the world's leading global engine manufacturers, Safran and GE among others. Despite the challenges, ISRO has successfully used such complex materials, especially Carbon-carbon

composites for aerospace structures in the parts of gas turbine engines such as flaps, vanes, seals and liners. That remains for India's ingenious plan for jet engine.

That is where the recent development and foreign collaborations matter where India needs to address the ceramic matrix composites (CMCs) for engine, especially the core.

Both global leaders of the jet engine — Safran Aircraft Engines and GE – can resolve the materials issues. In fact, jointly, Safran and GE have established an entity which is known as CFM Materials for their existing and futuristic jet engine. Additionally, the CMCs are also being tested with CentrAl reinforced aluminium (CentrAl) which can drastically improve performance and reduce the cost of aircraft manufacturing. CentrAl has proved to be 25% more tensile strength than high-strength aluminium alloys, with high fatigue resistance and high damage tolerance. For example, CentrAI has made a massive difference in CFM LEAP high-bypass turbofan engines which reduced fuel consumption by 16%.

Another key area that is being addressed, focuses on the CFD for jet engine solutions in the areas such as aerodynamics (Fluid Analysis), structure-fluid interface analysis, and heat transfer analysis. Besides, the CFD will provide tech capability for components managing heat in avionics systems, electrical and electronics systems, landing gear wheels, air-conditioning units, fuselage and cockpit pressurization units. The CFD will be crucial for fluid analysis, and aerodynamic analysis in aircraft comprising pressure, velocity, lift, drag, etc.

The other areas which need to be highlighted are single crystal blade technology, integrated rotor disk and blades. These are again highly dependent on the advanced materials mix.

Safran-HAL co-development

Once we cross the materials issue, the next stage is about developing capabilities for the supply chain of components & ancillaries in India for the next-generation 110 KN engine for AMCA and MRFA. Safran is already heavily investing in 6th generation fighter aircraft with afterburner thrust of 125 kN. That if it is well negotiated, will design & develop a 110kN engine with India without any hiccups and clauses which is prevalent in the inner world of elusive jet technology.

Here, the collaboration will enable critical cast components of Titanium and Super Alloys. India can not only leverage Safran's M88 engines which power Rafale fighter jets but the new -engine for military aircraft engine and other critical applications.

Collaboration is a much better option for India as it tests our real ambitions & efforts for such high tech. DRDO's Gas Turbine Research Engine (GTRE) has achieved some good fundamental success in single crystal blades where the French giant Safran will play an immense role which includes the core material, computational fluid dynamics & heat management etc.

In fact, Safran has proposed a better engine core than M-88 which powers Rafale.

Besides, Safran Helicopter Engines and HAL are already in the process of setting up their new joint venture company in Bengaluru, which will be dedicated to the design, development, production and support of helicopter engines for the 13-ton Indian Multi-Role Helicopters (IMRH) and its naval version, the Deck Based Multi-Role Helicopter (DBMRH).

In fact, elaborating on the proposed collaboration, Cedric Goubet, CEO of Safran Helicopter Engines, explained: "We at Safran Helicopter Engines are truly elated to partner with HAL and India to craft this new turboshaft engine joint venture set to address the Indian market and also future export opportunities." Safran's Ardiden 1H1 engine with Hindustan Aeronautics (HAL) as later called Shakti, is one of the most successful high-tech military projects which powers India's all indigenous helicopters, including the Advanced Light Helicopter (ALH) Dhruv, ALH Rudra and Light Combat Helicopter (LCH) Prachand.

Here, the scope of tech-collaboration has touched the engine manufacturing process in its entirety, including the two-stage centrifugal compressor, single-stage gas generator turbine, reverse flow combustion chamber, two-stage free power turbine, gear box unit and Dual channel FADEC (Full Authority Digital Engine Control). HAL will further leverage the compact modular design of Shakti 1H1 for IMRH and high-altitude sustained capabilities in extreme conditions.

Apart from fighter jet engine, the civil space is also witnessing unprecedented demand for aero engine. For example, the LEAP and its predecessor, CFM56, which power over 330 Airbus A320/A320neo and Boeing 737/737 MAX aeroplanes are operational in the Indian sub-continent.

With 1,500 LEAP engines currently on order Safran is also establishing a Maintenance, Repairs and overhaul (MRO) facility. Later, Safran is also planned to build parts.

According to a recent study, the aero-engine market is expected to grow from $54.7 billion in 2022 to $112.6 billion in 2029 at a CAGR of approximately 11%. India is expected to order 500 military aircraft over the years. Broadly, taking account of services requirement, there will be a demand for 2,700 turbine engines for fighter aircraft, including those for replacement and trainers, and over 5,000 helicopter engines of various classes.

https://www.financialexpress.com/business/defence-fighter-jet-engine-how-india-is-filling-gaps-in-critical-materials-core-technology-3174356/

THE ECONOMIC TIMES

Mon, 17 Jul 2023

Argentina Defence Minister Arrives in India on Four-day Visit

Argentina's Defence Minister Jorge Enrique Taiana on Monday arrived here on a four-day visit to India during which he will hold talks with his Indian counterpart Rajnath Singh to further consolidate the defence cooperation between the two countries, officials said. The visiting dignitary will also lay a wreath at the National War Memorial here and pay homage to the fallen heroes, the Ministry of Defence said in a statement here.

"Defence Minister of Argentine Republic Jorge Enrique Taiana arrived in New Delhi on July 17, 2023 on a four-day visit to India. During his stay, Mr Jorge Taiana will hold bilateral talks with Raksha Mantri Shri Rajnath Singh on July 18, 2023 to further consolidate defence cooperation between the two countries," it said.

The Argentine minister is also scheduled to visit Bengaluru, officials added.

https://economictimes.indiatimes.com/news/defence/argentina-defence-minister-arrives-in-india-on-four-day-visit/articleshow/101834384.cms

FINANCIAL EXPRESS
Read to Lead

Tue, 18 Jul 2023

Argentina’s Defence Minister Boosts Ties with India: Focused Talks and Cutting-edge Military Platforms on the Agenda!

The Defence Minister of Argentina, Jorge Enrique Taiana, is currently on a four-day visit to India and is scheduled to visit Bengaluru after his talks with Indian Defence Minister Rajnath Singh in

New Delhi. The purpose of the visit is to strengthen defence cooperation between the two countries.

In an official statement, the Ministry of Defence announced the visit of the Argentine Defence Minister, Jorge Enrique Taiana, who will engage in talks with his Indian counterpart, Rajnath Singh, on July 18 in New Delhi. The primary focus of these discussions will be to strengthen defence cooperation between Argentina and India.

Furthermore, the ministry confirmed that Minister Taiana will also visit Hindustan Aeronautics Limited (HAL) to discuss matters concerning the Light Combat Helicopter 'Prachand,' Advanced Light Helicopter (ALH) Dhruv, and Light Utility Helicopter for the Argentine armed forces.

This visit to HAL serves as a follow-up, as a team had previously visited Buenos Aires in June to present to the Argentine Air Force Chief, Brigadier General Xavier Isaac, in the presence of the Indian ambassador. However, the outcome of these presentations remains undisclosed.

The delegation-level meeting, to be co-chaired by both ministers on Tuesday, aims to further consolidate defence cooperation, according to Defence Ministry officials.

Argentina is now interested in receiving a formal proposal from India for its planned acquisition of 16 Light Combat Aircraft 'Tejas.' Additionally, the South American nation has expressed interest in acquiring BrahMos supersonic cruise missiles and Akash surface-to-air missile systems from India, as part of India's commitment to exporting major military platforms to friendly nations.

However, Argentina's decision-making process for defence acquisitions might be affected by the upcoming general elections scheduled for October 22, 2023. With the incumbent president, Alberto Fernández, announcing that he will not seek reelection despite being eligible for a second term, it is unclear whether Argentina will decide on the fighter jet procurement within the next one or two years, consequently leaving LCA Tejas's future uncertain.

The Argentine Air Force considered proposals from major global powers like Russia, India, China, and the US to acquire up to 18 supersonic fighter aircraft. Among these, China's offer meets their requirements, while the US is promoting its F-16 aircraft to counter China's influence in the Southern Hemisphere. In 2022, Defence Minister Jorge Taiana showed interest in acquiring new supersonic fighters after retiring the French Mirage aircraft from the 1970s. Argentina received four bids, including the JF-17 Thunder Block III, F-16 MLU, MiG-35, and Tejas for evaluation.

The Argentine Air Force had evaluated the JF-17 in China in May 2022 and the F-16 in Denmark in November and was planning a visit to India.

Reportedly, Argentina rejected the Russian proposal in 2022 primarily due to the conflict in Ukraine and the potential risk of facing unilateral sanctions if they acquired Russian arms.

Currently, the Argentine Air Force is carefully examining the technical specifications of each aircraft model along with logistical support, required maintenance, and the possibility of technology transfer for construction within Argentine territory. The US F-16 and the Chinese JF-17 Thunder Block III are being contemplated as potential procurement options since they align with Argentina's operational requirements and budget.

The Chinese JF-17 meets all of the Argentine Air Force's requirements for a multirole fighter, with a lower cost per flight hour compared to the F-16.

The JF-17's Chinese-made WS-13 engines, ejection seats, and non-restricted short- to medium-range missiles hold significance for Argentina since their fundamental requirement is to avoid British-origin components. This stems from the 1982 Falklands War when the British government imposed an embargo on military supplies to the Argentine military, including foreign military equipment containing British components.

In conclusion, the visit of the Argentine Defence Minister to India marks a crucial step in enhancing defence ties between the two countries. However, Argentina's final decision on the fighter jet procurement is likely to be influenced by the upcoming elections and the country's operational and budgetary considerations.

https://www.financialexpress.com/business/defence-argentinas-defence-minister-boosts-ties-with-india-focused-talks-and-cutting-edge-military-platforms-on-the-agenda-3175429/

THE ECONOMIC TIMES

Tue, 18 Jul 2023

Ukraine Activates Air Defences in Odessa Region

Ukraine activated aerial defences in coastal Odessa early Tuesday, authorities said, hours after Russia refused to extend a deal allowing the safe export of grain from the region.

"Odessa. Air defence combat work continues," said Sergiy Bratchuk, spokesman for the Odessa military region, on Telegram.

The Odessa region in southern Ukraine is home to maritime terminals that were key to the expired grain export agreement between Moscow and Kyiv.

Russia was "attacking the south of Ukraine with attack drones," head of the Odessa region's military administration, Oleg Kiper, said on Telegram.

He warned residents to stay in shelters.

Ukraine's southern operations command said Russia was "attacking the southern regions with unmanned attack vehicles."

Air alerts were also announced in Mykolayiv, Kherson, Zaporizhzhia, Donetsk, Kharkiv, Dnipropetrovsk, Poltava, Kirovograd, and Cherkasy.

Russia's invasion last year saw Ukraine's Black Sea ports blocked by warships until the agreement, signed in July 2022, allowed for the passage of critical grain exports.

The deal expired at midnight in Istanbul (2100 GMT) after Russia refused an extension, arguing that elements of the deal allowing the export of Russian food and fertilisers had not been honoured.

https://economictimes.indiatimes.com/news/defence/ukraine-activates-air-defences-in-odessa-region/articleshow/101840632.cms

ANI
South Asia's Leading Multimedia News Agency

Tue, 18 Jul 2023

South Korea to Hold International Defence Exhibition in October 2023

South Korea will hold an international defence exhibition in October to showcase advanced military hardware and technologies, amid Seoul's push to become a significant player in the global arms market, Yonhap news agency reported.

The six-day Seoul International Aerospace & Defense Exhibition (ADEX) 2023 will kick off on Oct. 17 at Seoul Air Base in Seongnam, just south of Seoul, involving 550 companies from 35 countries, the organizers said.

It would mark the largest-ever edition of the exhibition, which first launched in 1996.

During this year's event, the organizers seek to hold various aircraft demonstrations and exhibit advanced military assets and equipment, including F-35 radar-evading fighter jets, FA-50 light attack aircraft, K2 battle tanks and K9A1 self-propelled howitzers, Yonhap news agency reported.

Yonhap News Agency delivers news to its customers as well as newspapers, broadcasters, government agencies, businesses and Internet portals on a real-time basis. They are also in talks with the US military to showcase its aircraft and other assets to mark the 70th anniversary of the South Korea-US alliance this year, an official told reporters.

The first four days will host various seminars and forums for defence industry officials before the exhibition is opened to the general public in the last two days.

The exhibition's previous edition 2021 featured hydrogen-fuel drones, virtual reality-based training systems, laser weapons systems, multipurpose unmanned vehicles, and military aircraft, including FA-50 fighters, Yonhap news agency reported.

This year's event will take place after South Korea unveiled a goal last year to become the world's fourth-largest defence exporter by 2027.

https://www.aninews.in/news/world/asia/south-korea-to-hold-international-defence-exhibition-in-october-202320230718003804/

JANES

Mon, 17 Jul 2023

BAE Systems Scores Stratospheric Success for PHASA-35 Pseudo Satellite

BAE Systems has flown the PHASA-35 solar-powered high-altitude long-endurance (HALE) unmanned aerial vehicle (UAV) in the stratosphere for the first time, the company announced on 14 July.

Speaking at the Royal International Air Tattoo (RIAT) 2023 show at Royal Air Force (RAF) Fairford in Gloucestershire, Phil Varty, business manager UAV systems, BAE Systems, said the milestone flight had recently taken place over a 24 hour period, during which the electrically driven high-altitude pseudo-satellite (HAPS) ascended to an altitude of more than 66,000 ft before landing back at Spaceport America in the US state of New Mexico.

“The flight marks a significant milestone in PHASA-35's development [which began in 2018]. Designed by BAE Systems' subsidiary Prismatic Ltd to operate above the weather and conventional air traffic, it has the potential to provide a persistent and stable platform for various uses including ultra-long endurance intelligence, surveillance, and reconnaissance, as well as security,” BAE Systems said. “[Carrying a 15 kg payload], it also has the potential to be used in the delivery of communications networks including 4G and 5G and could be used in a wide range of applications, such as disaster relief and border protection, as an alternative to traditional airborne and satellite systems.”

As noted by Varty, this milestone flight saw the PHASA-35 ascend at a rate of 1 ft/sec, passing through the troposphere where the weather could adversely impact the delicate 150 kg aircraft with its 35 m wingspan, before passing into the meteorologically stable stratosphere where it is designed to operate for months, even a year, at a time.

https://www.janes.com/defence-news/news-detail/bae-systems-scores-stratospheric-success-for-phasa-35-pseudo-satellite

Airforce Technology

Mon, 17 Jul 2023

UK MoD Awards Contract to Begin Next Phase of Excalibur Test Aircraft

The UK Ministry of Defence (MoD) has awarded a £115m ($150.4m) contract to begin the next phase of the Excalibur Flight Test Aircraft (FTA) project, which will see a Boeing 757 airliner overhauled and turned into a test platform for technologies that could be used by the Global Combat Air Programme (GCAP).

Announced at the Royal International Air Tattoo (RIAT) airshow on 14 July, the contract, which was awarded to Leonardo and delivered in partnership with 2Excel, is the next step in the delivery of the Excalibur project and will feed into much the UK's Future Combat Air System (FCAS), one element of the GCAP effort.

According to the UK Government the Excalibur aircraft will be adapted to host integrated sensors, digital technology, and integrated communications, and is expected to fly with the new technology within the next three years.

The GCAP collaboration between the UK, Italy, and Japan intended to deliver a next-generation air combat platform for 2035.

In 2022 it was revealed that the UK had already begun work on a technology demonstrator aircraft under the FCAS programme, with a first flight test due by 2027. Designed as a sixth-generation stealth combat air platform, the Tempest FCAS is intended to begin entering service from 2035 and gradually replace the Royal Air Force's Typhoon fleet.

UK jet engine manufacturer Rolls-Royce is also developing a new turbine under Project Orpheus, to inform propulsion requirements for the Tempest platform. With the tight timescales required by the GCAP effort, early testing of a system that could be integrated into Tempest could aid in delivery the platform, according to the current schedule.

Also at RIAT, UK Defence Procurement Minister, James Cartlidge, signed the Defence Aviation Net Zero Charter, which follows the release of the Defence Aviation Net Zero Strategy and is part of the MoD's effort to contribute to the UK Government's Net Zero by 2050 goal. Aviation accounts for over 30% of defence carbon emissions in the UK, with ESG a significant factor for both public and private organisations.

https://www.airforce-technology.com/news/uk-mod-awards-contract-begin-next-phase-excalibur-test-aircraft/

THE ECONOMIC TIMES

Mon, 17 Jul 2023

Chandrayaan-3 to Explore Possibility of Human Settlement on Moon: Science Minister Jitendra Singh

The Chandrayaan-3 mission will take up the exploration of the Moon where India's first lunar mission, Chandrayaan-1, left off. According to Union minister of state for science Jitendra Singh, the ISRO latest mission will also search for resources that could sustain life on Moon.

In an interview with TOI, Jitendra Singh stated, "Chandrayaan-1 was an entirely different mission than all other space missions." This is due to the fact that when India began its space voyage in the early 1960s, America was already preoccupied with its Apollo human trips to the Moon. Despite the fact that the United States landed on the Moon decades ago, no sign of water has previously been discovered." Singh highlighted the significance of Chandrayaan-1's groundbreaking discovery of water molecules on the Moon in 2009, which sparked a new era in space research and piqued NASA's interest in India's Moon mission. "By probing deeper into the Moon's surface and expanding on Chandrayaan-1's discoveries, Chandrayaan-3 is ready to take exploration to new heights. The primary goal of the mission is to find more evidence of water on the Moon, particularly in the South Pole region, which has mostly gone untouched by other nations," Singh said.

"There have been detected dark, persistently shaded craters, indicating possible water sources that could revolutionize lunar science and pave the door for future human housing possibilities," he said. Minister Singh emphasized the scientific opportunities that could arise if Chandrayaan-3 discovers more evidence of water, as water molecules contain hydrogen and oxygen, offering a rich source of clean energy on the Moon. These findings could significantly impact future space missions and open doors to space entrepreneurship through startup ventures.

At the G20 Young Entrepreneurs Alliance Summit in Delhi, Minister Jitendra Singh encouraged young scientists and youth from G20 nations to seize space exploration opportunities, promoting joint mission collaborations in a groundbreaking age of space entrepreneurship. Chandrayaan-3 marks a crucial step in India's space journey, propelling humanity towards a deeper understanding of the Moon and the potential for human habitation on our celestial neighbor.

https://economictimes.indiatimes.com/news/science/chandrayaan-3-to-explore-possibility-of-human-settlement-on-moon-science-minister-jitendra-singh/articleshow/101830034.cms

FINANCIAL EXPRESS
Read to Lead

Tue, 18 Jul 2023

Chandrayaan-3: A Historic Leap Encompassing Economic Enrichment in India’s Space Endeavours

The failure of Chandrayaan-2 in 2019 inspired Indian scientists at the Indian Space Research Organisation (ISRO) to correct their mistakes and be better prepared for Chandrayaan-3’s mission

from the Satish Dhawan space complex in Andhra Pradesh's Sriharikota. If the landing is successful next month, India will join the elite group of countries like the United States, Russia, and China to do so.

54 Women Making Their Mark in Chandrayaan-3: Meet Dr Ritu Karidhal Srivastava, Leading the Mission

Despite the fact that the Chandrayaan-3 mission is led by men, unlike the Chandrayaan-2 mission, a significant number of women are involved in the project. About 54 female engineers/scientists were directly involved in the Chandrayaan-3 programme. They are associate and deputy project directors, as well as project managers for various systems at various centres.

The mission is being led by Dr Ritu Karidhal Srivastava, one of ISRO's senior scientists.

Here's everything you need to know about her.

Ritu Karidhal Srivastava, a senior scientist at the Indian Space Research Organisation (ISRO), gained fame for her crucial role in the success of the Mars Orbiter Mission. With a master's degree in physics from Lucknow University and a master's degree in technology from the Indian Institute of Science (IISc) in Bengaluru, she has been fascinated by space since her youth, collecting articles on ISRO and NASA projects. Joining ISRO in November 1997, she has played a pivotal role in several significant space missions, serving as operations director and publishing approximately 20 papers in international and national journals. As the deputy director of the Mars expedition, she earned the moniker "Rocket Woman of India" and received the ISRO Young Scientist Award from former Indian President DR APJ Abdul Kalam in 2007. She has also delivered a TED talk, sharing insights on the Mars Orbiter Mission.

The Chandrayaan-3 mission will have huge economic consequences for India.

India's ascent on the global platform is observable in multiple fields, encompassing technology, talent, and culture. The triumph of Chandrayaan-3 showcases our tenacity, resolve, and capacity to recover with assurance. This achievement holds immense significance, extending beyond the annals of our space programme, for it symbolizes India's emergence onto the international stage.

The mission plays a vital role in fostering the development of the national space sector, opening doors for innovativeness, technological progress, and employment generation.

The triumph of the mission has the potential to allure investments and revitalize the sector. India's private space technology ecosystem is brimming with a wide range of prospects, courtesy of a fresh wave of visionary entrepreneurs.

Industry Players Enabling Chandrayaan 3's Success

Larsen & Toubro Pvt. Ltd.

When Larsen & Toubro Ltd. stated that it has contributed vital components to India's moon mission, the company's stock rose 1%. The corporation has said that it contributed crucial components for the Chandrayaan expedition, including the middle section and nozzle bucket flange, as well as ground and flight umbilical plates.

The company's state-of-the-art factories in Powai and Coimbatore produced these components. L&T has already participated in an Indian space mission. It had previously provided different hardware for the Gaganyaan, Mangalyaan, Chandrayaan-1, and Chandrayaan-2 missions.

Godrej Aerospace

Godrej Aerospace is another business that is currently in the spotlight after the company disclosed its involvement in Chandrayaan 3. On the day of the launch, Maneck Behramkamdin, AVP &

Business Head at Godrej Aerospace said: ‘We take enormous delight in our participation in ISRO’s Chandrayaan 3 mission.’

It has been reported earlier that in the past, Godrej Aerospace had important parts in the Chandrayaan 1 and Chandrayaan 2 films. It was in charge of providing the Vikas engine, thrustors, vital components for the remote sensing antenna, and the ground system antenna for Chandrayaan 1. It provided the GSLV Mk III launcher’s L110 and CE20 engines, as well as the thrusters for the orbiter and lander and the DSN antenna, for Chandrayaan 2.

Financial Express Online has reported earlier that for a long time, Godrej Aerospace has been a crucial component of India’s space exploration initiatives. It has given the Polar Satellite Launch Vehicle (PSLV) 175 engines throughout the past three decades.

Two more Hyderabad-based businesses, in addition to L&T and Godrej Aerospace, have been essential to the effort. The project’s structural components, including the Mark-11 release mechanism, were built in part by Sri Venkateswara Aerospace. A lithium-ion battery casing made of an aluminium alloy was provided by Naga Sai Precision Engineering Works.

Other companies

The success of this mission was also contributed by several other companies. Bharat Heavy Electricals played a significant role in ensuring the mission’s success. Hindustan Aeronautics Limited, known for its expertise in aerospace technology, was another key contributor. Walchandnagar Industries, renowned for its manufacturing capabilities, played a crucial role in providing necessary components. Centum Electronics, specializing in the field of defence electronics, made valuable contributions. Mtar Technologies, with its expertise in precision engineering, played a significant role in the mission’s success. Linde India, known for its expertise in industrial gases, provided critical support.

Girish Linganna, Bangalore based Space Expert says: “These companies, along with others, added their expertise and capabilities to ensure the success of this important mission by collaborating and bringing their unique contributions to the table. It is essential to keep an eye on their progress as they continue to make a significant impact in their respective fields.”

Titanium a Critical Mineral Takes Center Stage: The Crucial Component in Chandrayaan 3

“It should be duly acknowledged that the lunar subsurface harbours elevated concentrations of specific metals, namely iron and titanium, exceeding previous estimations,” Linganna, expresses.

Three Kerala-based Public Sector Undertakings (PSUs) have made significant contributions to the successful launch of Chandrayaan 3 last week on Friday. Based on the information available in the public domain, the PSUs include Keltron, Kerala Minerals and Metals Limited (KMML), and Steel and Industrial Forgings Limited (SIFL), who played a crucial role in the production of the rocket.

Keltron has played a vital role in the production of 41 electronics module packages, which have been essential for the manufacturing process. KMML’s titanium sponge alloys have proven to be indispensable in the development of pivotal components for the spacecraft. Furthermore, SIFL has manufactured titanium and aluminium forgings, as well as other accessories, contributing significantly to the project’s success.

he KMML Titanium Sponge Plant, established with the aid of technology created by the Defence Metallurgical Research Laboratory (DMRL), a division of DRDO, supplied the titanium sponge metal used in manufacturing engine components for India’s ambitious lunar mission, Chandrayaan-3. For the past six to seven years, KMML has been supplying materials to the Vikram Sarabhai Space Centre (VSSC), a prominent space research center of ISRO. This collaboration extends to both the Chandrayaan 2 mission and India’s forthcoming lunar mission, Chandrayaan-3. According to Linganna, “VSSC procures aerospace grade titanium sponge metal from KMML, which is then

melted and transformed into titanium alloy for engine parts. With an annual production capacity of 300 tonnes, KMML caters to VSSC's requirement amounting to at least 50 percent of the total titanium sponge metal produced each year."

https://www.financialexpress.com/lifestyle/science/chandrayaan-3-a-historic-leap-encompassing-economic-enrichment-in-indias-space-endeavours/3175507/