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Press Information Bureau
Government of India

Ministry of Defence

Sun, 31 Dec 2023

Government Developing a Strong Base of Domestic Defence Industrial Ecosystem to Make India a Strategic Economy: Raksha Mantri Shri Rajnath Singh

“New India no more tolerant to ‘let it be’ mindset & believes firmly in ‘let's do it’ approach”

Raksha Mantri Shri Rajnath Singh has said that the Government is developing a strong base of domestic defence industrial ecosystem to make India a strategic economy. Addressing the 21st convocation ceremony of Tezpur University on December 31, 2023 at Tezpur, Raksha Mantri said, the ministry is making all efforts to achieve the target of becoming self-reliant in the defence sector. Highlighting the various steps taken by the Ministry of Defence to achieve Aatmnirbharta in defence, Shri Rajnath Singh stressed that for the first time, the import of arms was restricted. “We issued five positive indigenization lists, under which 509 such defence equipment have been identified, whose manufacturing will now be done indigenously. In addition, we have also issued 4 positive indigenization lists of Defence Public Sector Undertakings, in which 4,666 items have been identified which will now be manufactured in our country,” said Raksha Mantri.

Underscoring the government's focus on domestic defence manufacturing, he quoted that for the first time, the production has crossed the record figure of Rs. One Lakh Crore. “The total value of India's defence exports, which was Rs 1,521 crore in 2016-17, has increased almost 10 times to reach a record level of Rs 15,920 crore in 2022-23,” he stated.

Shri Rajnath Singh elaborated on the proactive attitude of the present government in tackling any situation, which has replaced the crisis of credibility with a culture of confidence. “India is no more tolerant of the “let-it-be” approach. Today, under the leadership of Prime Minister Shri Narendra Modi, the new India believes in “let's-do-it” approach,” he said.

On the issue of women empowerment, Shri Rajnath Singh said, the government has taken steps to ensure proper representation of women in all sectors including the military. “Today, women are walking shoulder to shoulder with men in every field in the country. From fighter planes to Chandrayan, there is no field in which the presence of women is not seen,” said Raksha Mantri.

Underscoring the significant role of youth in making the country Viksit Bharat, Raksha Mantri said, the idea of making India an economic and military superpower is based on confidence in the capabilities of talented youth. “To empower the youth and enhance their capabilities, our government has promoted start-up culture and innovation ecosystem”, he added.

Mentioning the start-up culture initiated by the Ministry in the Defence Industrial Sector, Shri Rajnath Singh said the Innovation for Defence Excellence (iDEX) has been successfully promoting innovative ideas since its inception. “Because of the various efforts by the Government to promote entrepreneurship among youth, today there are over one lakh start-ups in the country,” he said.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1991950>



Press Information Bureau
Government of India

Ministry of Defence

Sun, 31 Dec 2023

Indian Navy Enhances Surveillance in North/ Central Arabian Sea and Gulf of Aden

The last few weeks have witnessed increased maritime security incidents on merchant vessels transiting through international shipping lanes in Red Sea, Gulf of Aden and Central/ North Arabian Sea. The piracy incident on MV Ruen approximately 700 nautical miles from the Indian coast and recent drone attack on MV Chem Pluto, approximately 220 nautical miles South West of Porbandar indicates a shift in maritime incidents closer to Indian EEZ.

In response to these incidents, Indian Navy has substantially enhanced maritime surveillance efforts in Central/ North Arabian Sea and augmented force levels. Task Groups comprising destroyers and frigates have been deployed to undertake maritime security operations and render assistance to merchant vessels in case of any incident. Aerial surveillance by long-range maritime patrol aircraft and RPAs has been enhanced to have a complete maritime domain awareness. Towards effective surveillance of EEZ, Indian Navy is operating in close coordination with Coast Guard.

The overall situation is being closely monitored by Indian Navy in coordination with national maritime agencies. Indian Navy remains committed to ensuring safety of merchant shipping in the region.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1991900>



Press Information Bureau
Government of India

Ministry of Defence

Fri, 29 Dec 2023

Delivery of Seventh 250 Men Ferrycraft, ‘MANJULA’ (YARD 786)

Contract for construction and delivery of 07 x 250 Men Ferry Craft was concluded with M/s Shalimar Works Ltd, Kolkata, in consonance with “Aatmanirbhar Bharat” initiatives of the Government of India. Six out of Seven Ferrycraft have already been delivered to IN. Seventh

Ferrycraft, 'Manjula' (Yard 786) has been delivered to Indian Navy on 29 Dec 23 in presence of Rear Admiral Deepak Kumar Goswami, ASD (Mbi). With all major and auxiliary equipment/systems sourced from indigenous manufacturers, these Ferrycraft are proud flag bearers of "Make in India" initiatives of Ministry of Defence.

With a capacity to ferry 250 Men, Induction of 'Manjula' (Yard 786) would provide impetus to Operational Commitments of IN by facilitating Transportation of both Men and Material between Indian Naval Ports and Ships/Submarines at anchorage.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1991612>



Press Information Bureau
Government of India

Ministry of Defence

Fri, 29 Dec 2023

Defence Secretary Inaugurates New Design & Test Facility at HAL's Aero Engine Research & Development Centre in Bengaluru

Defence Secretary Shri Giridhar Aramane inaugurated a new design and test facility at Aero Engine Research and Development Centre (AERDC) of Hindustan Aeronautics Limited (HAL) in Bengaluru, Karnataka on December 29, 2023. The AERDC is currently involved in the design and development of several new engines including two strategic engines - Hindustan Turbo Fan Engine (HTFE) of 25 kN thrust for powering trainers, UAV's, twin engine small fighter aircraft or regional jets and Hindustan Turbo Shaft Engine (HTSE) of 1200 kN thrust for powering light and medium weight helicopters (3.5 to 6.5 tonnes in single/ twin engine configuration).

The new state-of-the-art facility, spanning over 10,000 sq. meters, houses special machines, advanced setups leveraging on computational tools, in-house fabrication facility and two test beds for testing HTFE-25 and one testbed each for testing HTSE-1200 and upcoming JV engine for IMRH to be co-developed by Safran, France and HAL. In addition, the newly developed facility has set-ups for testing Air producer of Jaguar, Gas Turbine Starter Unit (GTSU) - 110 M2 and 127E of Light Combat Aircraft, Auxiliary Power Units of Indian Multi-Role Helicopter and Advanced Medium Combat Aircraft, Gas Turbine Electrical Generator (GTEG)-60 for An-32 aircraft. Set-ups to carry out various critical tests for engine components and Line Replacement Units (LRUs) have also been established within the new facility.

Hailing the work being done by HAL, the Defence Secretary stated that the government trusts the capability of the Defence PSU to deliver and make the country self-reliant. "Manufacturing sector is the future of the country and in the coming decades, the HAL should focus on mastering technologies for all types of aircraft. Think ahead as the entire paradigm of warfare is changing," he said.

Highlighting the role of unmanned aircraft in future warfare, the Defence Secretary encouraged the HAL to collaborate with other private companies to develop new platforms. He inspected the manufacturing range of various engines and test beds and also paid a visit to HAL's Aerospace Division. Chairman & Managing Director (Addl. Charge) of HAL Shri CB Ananthkrishnan said: "The development of this facility marks a key milestone in HAL's growth trajectory. It is a

testimony of our commitment towards achieving ‘Aatmanirbharta’ in aero-engine design and development.”

The Centre, established in the 1960s, holds the unique distinction of being the only design house that has developed test beds for engines of both Western and Russian origin. The Centre has successfully developed & certified PTAE-7 engine, the first indigenous turbojet engine of India powering Lakshya (Unmanned Aircraft), Gas Turbine Electrical Generator GTEG-60 for starting An-32 aircraft, Air starter ATS 37 & Air producer for starting Adour-Mk 804E/811 on Jaguar Aircraft and Shakti engine for powering ALH to support Ad804/811 engine of Jaguar aircraft.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1991532>



Sat, 30 Dec 2023

Indian Navy Sheds Colonial Link in New Epaulettes for Officers

The Indian Navy on Friday unveiled the new design of senior officers’ epaulettes, a shoulder piece that signals rank, inspired by the seal of Chhatrapati Shivaji Maharaj, with the move reiterating the service’s resolve to shed the “mentality of slavery” and project the country’s “rich maritime heritage”.

The new epaulettes, to be worn by the navy chief, vice admirals and rear admirals from January 1, have five modifications over the previous ones.

The development comes weeks after Prime Minister Narendra Modi announced that senior naval officers will wear epaulettes that bear the imprint of the Maratha ruler’s maritime legacy. He revealed the proposed change in his Navy Day address at Sindhudurg in Maharashtra on December 4. In the new design, the navy has done away with the Crown-inspired red background on which the national emblem sits and replaced it with an octagon derived from the Maratha king’s rajmudra or royal seal.

“The octagon represents the eight cardinal directions, indicative of an all-round long-term vision,” the navy said in a statement.

Last year, Modi unveiled the navy’s new ensign that also featured Shivaji’s seal, which replaced the colonial St George’s cross. The naval ensign was unveiled during the commissioning of India’s first indigenous aircraft carrier INS Vikrant at Kochi in September 2022.

Also, there is a twin-change in the crossed sword and baton on the epaulettes.

The generic sword has been replaced by a straight double-edged sword of Indian origin (akin to the Khanda used by Rajput warriors), and the baton (a symbol of authority) has given way to a telescope symbolising “long-term vision and foresight”.

“The Indian sword emphasises the very essence of our raison d’être, viz., be the cutting edge of national power and win wars through dominance, defeating adversaries and overcoming every challenge. The telescope symbolises a long-term vision, foresight and a weather-eye in an ever-changing world,” the statement said. The fourth change is the new style of stars on the epaulettes. This has no particular significance other than increasing the aesthetic appeal, HT has learnt. The navy chief dons four stars as an admiral, vice admirals wear three and rear admirals don two.

The final change is in the golden navy button on the epaulettes. It no longer features the foul anchor with the nautical rope, associated with the colonial era, and the design has introduced a clear anchor.

This change, from foul to clear anchor, is in line with the modification in the navy crest in December 2022. The clear anchor depicts steadfastness of the Indian Navy to deter any challenge in the maritime domain, and represents clarity in vision, mission and aspirations of its sailors, the navy said in a statement at the time.

Decoding the new epaulette

HT

The new epaulettes, to be worn by the navy chief, vice admirals and rear admirals, from January 1, 2024, have five modifications over the previous ones

- 1 GOLDEN BUTTON**
The golden navy button on the epaulettes no longer features the foul anchor with the nautical rope, associated with the colonial era, and the design has introduced a clear anchor
- 2 SHIVAJI'S SEAL**
Navy has discarded the Crown-inspired red background on which the national emblem sits and replaced it with an octagon derived from Shivaji's seal
- 3 INDIAN SWORD**
The generic sword has been replaced by a straight double-edged sword of Indian origin, akin to the Khanda used by Rajput warriors
- 4 TELESCOPE**
The baton (a symbol of authority) has given way to a telescope symbolising "long-term vision and foresight"
- 5 STARS**
The new style of stars on the epaulettes has no particular significance other than increasing aesthetic appeal

“As we usher in the new year #2024, #IndianNavy proudly unveils the new Design of Admirals’ Epaulettes. Announced by @PMOIndia during #NavyDay2023 at Sindhudurg - the (octagon) in the new Design, drawn from the Naval Ensign & inspired by Rajmudra of #ChhatrapatiShivajiMaharaj, is a true reflection of our rich maritime heritage,” the navy wrote on X on Friday.

“Adoption of the new design reaffirms our commitment to the two pillars of #PanchPran’ - ‘Virasat Par Garv’ & ‘Ghulami ki Mansikta se Mukti. #BharatiyaNausena embracing #Bharatiyata in letter and spirit.”

In his 2022 Independence Day speech, Modi spoke of the “panch pran” or five pledges for India to become a developed country by its 100th year of independence.

The Prime Minister also announced on December 4 that an upcoming nomenclature of naval ranks will also be in line with Indian traditions. The new epaulettes and the Indianised ranks will be the latest in a series of changes introduced by the navy since September 2022 to discard traditions associated with the British empire. It has adopted a new ensign, done away with batons for commanders and allowed traditional Indian wear in officers' messes.

It has completed a review of ranks held by sailors, inherited from the British, and is set to replace them with Indianised designations, HT reported on October 9. Gender-neutral changes to the ranks will also be announced shortly. More than 65,000 sailors will now get new ranks.

<https://www.hindustantimes.com/india-news/indian-navy-sheds-colonial-link-in-new-epaulettes-for-officers-101703875558654.html>

THE TIMES OF INDIA

Sun, 31 Dec 2023

Attacks on Merchant Vessels: Indian Navy Enhances Maritime Surveillance Efforts in Arabian Sea

The Indian Navy has enhanced maritime surveillance efforts in central as well as northern parts of Arabian Sea. This comes amid the rising incidents of attacks on merchant vessels transiting through international shipping lanes in the Red Sea, Gulf of Aden and central/north Arabian Sea.

Task Groups comprising destroyers and frigates have also been deployed to undertake maritime security operations and render assistance to merchant vessels in case of any incident.

In addition, the Navy is working in close coordination with the Indian Coast Guard.

"Aerial surveillance by long-range maritime patrol aircraft and Remotely Piloted Aircraft (RPAs) has been enhanced to have complete maritime domain awareness. Towards effective surveillance of Exclusive Economic Zone (EEZ), the Indian Navy is operating in close coordination with the Indian Coast Guard," it said on Sunday.

Navy chief Admiral R Hari Kumar issued directions to take all possible actions to enhance security in the Arabian Sea region, officials said on Sunday.

As per officials, the Indian Navy chief has asked to keep a close lookout for any suspicious activity in the region, which saw incidents of attacks on merchant vessels recently.

The Navy said that the piracy incident on MV Ruen (approximately 700 nautical miles from the Indian coast) and the recent drone attack on MV Chem Pluto (approximately 220 nautical miles south west of Porbandar) indicates a shift in maritime incidents closer to Indian EEZ.

While the MV Chem Pluto was attacked on December 23, MV Ruen was hijacked in the Arabian Sea on December 14.

Another commercial oil tanker -- MV Sai Baba, which was on the way to India -- came under a suspected drone strike in the southern Red Sea.

In view of the spate of attacks on commercial vessels in the Arabian Sea, the Navy has deployed the P-8I long-range patrol aircraft for surveillance, and warships INS Mormugao, INS Kochi and INS Kolkata in the region.

"The overall situation is being closely monitored by the Indian Navy in coordination with national maritime agencies. Indian Navy remains committed to ensuring the safety of merchant shipping in the region," it added.

Washington accused Tehran of carrying out the drone attack on MV Chem Pluto, claims Iran's foreign ministry dubbed 'worthless'. It was the first time that Washington openly accused Iran of directly targeting ships since the start of Israel-Hamas war.

The Red Sea attacks on shipping since the beginning of the Israel-Hamas war have prompted major firms to reroute their cargo vessels around the southern tip of Africa. The US and other naval forces operate in the Red Sea region to defend commercial shipping.

<https://timesofindia.indiatimes.com/india/attack-on-merchant-vessels-mv-ruen-mv-chem-pluto-indian-navy-enhances-maritime-surveillance-efforts-in-arabian-sea/articleshow/106417489.cms>



Sun, 31 Dec 2023

IAF to Extend Life of Russian Su-30MKI Fighter Jet Fleet by more than 20 Years

Having started the induction of Sukhoi-30 MKI fighter jets about two decades ago, the Indian Air Force is now planning to extend the service life of its Russian-origin combat aircraft by more than 20 years.

The Indian Air Force has inducted 272 of the Su-30 MKI fighter aircraft operating in its fleet and the twin-engine planes are going to be the mainstay of the force for at least the next 15-20 years.

"Indian Air Force is looking to extend the service life of the fighter jets by another 20 years or more. Indian Air Force carries out extensive tests on the airframe and other parts of the aircraft to extend their service life and has had earlier experience in doing so," defence officials told ANI.

"Service life extension would help the Indian Air Force to maintain the fleet of its mighty Su-30s around 2045-2050," they said.

Indian Air Force is also working on boosting the capabilities of the aircraft by equipping it with major upgrades in terms of indigenous advanced radars, avionics and weapon systems. It is working to upgrade its fleet of Sukhoi-30 MKI fighters with indigenous weapon systems and radar named Virupaaksha.

"Virupaaksha radar is being developed indigenously, keeping in view the requirements of IAF in different sectors and would be the most advanced one among all the Sukhoi-30 variants being flown around the globe," the government sources said.

Sources added that the Indian Air Force has been working on a mission mode to indigenize the equipment in its inventory and looking to buy equipment from Indian firms worth over Rs three lakh crore in the near future.

The Su-30MKI is a multi-role air dominance fighter that can carry a versatile array of weapons including the Astra Mk-1 long-range air-to-air missile, Brahmos Air Launched missile, and an array of bombs, among others.

<https://www.aninews.in/news/national/general-news/iaf-to-extend-life-of-russian-su-30mki-fighter-jet-fleet-by-more-than-20-years20231231183416/>

Indian Navy's INS Vikrant Equipped with New Radar, Missile Launch Platform

Indian Navy's first indigenously designed and manufactured aircraft carrier, the INS Vikrant, is back sailing, after completing a mandatory 'guarantee refit' at the Cochin Shipyard, which originally made the 45,000 tonne warship.

"The sailing is part of the sea trials after the refit," sources said adding that a key addition is the launch platform for medium range surface-to-air missiles – the Barak 8. The carrier has also now been fitted with

Israel-designed MF-STAR (multi-function surveillance, track and guidance radar) – both are crucial as the warship is heading for an operational deployment in January.

The MF-STAR detects airborne threats like aircraft, anti-ship missiles and cruise missiles, the Barak-8 missile can shoot these at ranges of 80 km or more.

In the first week of December, Vice Admiral MA Hampiholi, who headed the Southern Naval Command, told reporters in Kochi that Vikrant would be "operationalised" by the end of January 2024. Vice Admiral Hampiholi retired today and is succeeded by Vice Admiral V Srinivas.

The INS Vikrant also has new Commanding Officer Captain Birendra S Bains, assumed command from Capt Vidhyadhar Harke.

The mandatory 'guarantee refit' entails repairing, re-equipping, and re-supplying the concerned platform to certify its overall functioning.

The INS Vikrant was commissioned in September 2022, the refit was pre-scheduled to be carried out once the carrier completed its flight trials and fleet integration activities. The carrier showcased its maritime prowess as part of two-carrier battle group operations – with the INS Vikramaditya — off Goa coast in the first week of June 2023.

The Vikrant, once deployed, will lead the carrier battle group at sea. It will expand Indian Navy's arch of 'surveillance', provide more attack options at sea while having the agility to match latest warships. A carrier battle group would comprise the Vikrant, a submarine or two, three- or four other warships and a fleet tanker carrying tonnes of food and fuel for mid-sea replenishment.

Besides own radars, the Vikrant will get feed from satellite Rukmini, surveillance planes like the Boeing P8-I and Drones like the Predator.

<https://www.tribuneindia.com/news/india/ins-vikrant-equipped-with-new-radar-missile-launch-platform-577086>

INS Imphal | Guided Missile Destroyer

On December 27, the third of four P-15B 'Visakhapatnam' class stealth guided missile destroyer was commissioned into the Indian Navy as INS Imphal at the Naval Dockyard, Mumbai. Imphal

has the unique distinction of being the first warship to be named after a city in the Northeast. In addition, the time taken to build Imphal and for her trials is the shortest for any indigenous destroyer, according to the Navy.

Describing the ship as a shining example of 'Aatmanirbharta' in defence, Defence Minister Rajnath Singh said at the induction ceremony: "INS Imphal is a symbol of India's growing maritime power and it will strengthen it further. It will bolster our principle of 'Jalmev Yasya, Balmev Tasya' (One who controls the sea is all powerful) in the Indo-Pacific region."

Imphal's keel was laid on May 19, 2017 and the ship was launched into water on April 20, 2019. Imphal sailed out for her maiden sea trials on April 28, 2023 and has completed a comprehensive schedule of trials, both in the harbour and at sea, and was delivered to the Navy on October 20, within a record time frame of six months — the "fastest for a ship of its size". The ship successfully completed the first-ever test-firing of the extended range BrahMos supersonic cruise missile prior to its commissioning, making it 'weapon-ready'.

Expansion of warships

The speeding up of the construction process is especially important as the Navy looks to expand its fleet of capital warships in line with its growing commitments and engagements in the Indian Ocean Region (IOR) and the larger Indo-Pacific as also against the backdrop of a sharp increase in Chinese naval presence in the IOR. "We are on track to be a 170-180 [ship] Navy by 2028. 66 out of 68 ships presently under construction are also being built at Indian Shipyards. Further, 24 ships under contract conclusion, will similarly be indigenous — our aim is for the Navy to be fully Aatmanirbhar by 2047," Navy chief Admiral R. Hari Kumar told The Hindu recently.

Mr. Singh also defined INS Imphal as a "conglomeration" of different strengths of the nation. BrahMos cruise missiles have been installed on the ship by Brahmos Aerospace; torpedo tube launchers by Larsen & Toubro (L&T), rapid gun mount by BHEL, and medium-range missiles by Bharat Electronics Limited (BEL). In addition, many start-ups and Micro, Small, Medium Enterprises are involved in its construction. The ship boasts a high level of indigenisation, about 75%, which includes indigenous equipment/systems, combat management systems, rocket launchers, torpedo launchers and integrated platform management systems.

The contract for construction of four ships under Project-15B was signed in January 2011 at a cost of about ₹29,643.74 crore. The ships have been designed in-house by the Directorate of Naval Design and constructed by Mazagon Dock Shipbuilders, Mumbai. The P-15B class are a follow-on to the P-15A Kolkata class destroyers and named after major cities from all four corners of the country — Visakhapatnam, Mormugao, Imphal and Surat. The first two ships, INS Visakhapatnam and INS Mormugao, were commissioned in 2021 and 2022, respectively. The last of the class, Surat, is expected to be commissioned in 2024.

The design of Project 15B has largely maintained the hull form, propulsion machinery, many platform equipment, major weapons and sensors as the Kolkata class to benefit from series production. However, these ships have enhanced stealth features over the earlier class resulting in a reduced radar cross section through shaping of hull, plated masts and use of radar transparent deck fittings, which make these ships difficult to detect.

INS Imphal measures 163 m in length and 17 m in breadth and has a displacement of 7,400 tonnes. The ship is propelled by four gas turbines, in a combined gas and gas configuration, and is capable of speeds in excess of 30 knots. The ship has a total complement of 315 personnel, and is commanded by Captain K.K. Choudhury, a gunnery and missiles specialist.

<https://www.thehindu.com/news/national/ins-imphal-guided-missile-destroyer/article67690931.ece>

Missile Specialist to Navigation Expert: The Crew of INS Imphal

The spanking new and highly capable guided missile destroyer INS Imphal will enable the Indian Navy to confront challenges in distant seas, including China's carefully calculated power play for influence in the Indo-Pacific, defending the rules-based international order, the Arabian Sea emerging as a new front with Red Sea tensions escalating and counterpiracy in the Gulf of Aden, officials aware of the matter said.

Its sister ship, INS Mormugao, is among the five frontline warships that the navy has deployed in the Arabian Sea in the face of rising threats, including the recent attacks on two India-bound merchant vessels (MV) by Iran-backed Houthi rebels and the resurgence of piracy, the officials said.

That the navy will play a critical role in the region was amply evident when defence minister Rajnath Singh on December 26 warned those behind the attacks on MV Chem Pluto and MV Saibaba, saying India "will hunt them down even from the depths of the ocean".

In response to these incidents, the navy has "substantially enhanced" the surveillance effort in central and northern Arabian Sea and augmented force levels, the navy said in a statement on Sunday.

"Task groups comprising destroyers and frigates have been deployed to undertake maritime security operations and render assistance to merchant vessels in case of any incident. Aerial surveillance has been enhanced too," it added.

INS Imphal and INS Mormugao have been built under the ₹35,000-crore Project-15B class of four guided missile destroyers. INS Visakhapatnam and INS Mormugao were commissioned into service in 2021 and 2022, and Surat, the fourth one, is under construction at the Mumbai-based Mazagon Dock Shipbuilders Ltd and is expected to join the naval fleet next year.

As INS Imphal prepares for operational deployment to further boost the navy's readiness in the vast strategic expanse, HT gets you upclose with the crew whose job is to ensure that the destroyer is battle ready at all times.

Captain Kamal Kumar Choudhury, Commanding Officer: Commissioned into the navy in 1998, Choudhury is the man with the overall responsibility of the warship. The 46-year-old led the commissioning crew that put the destroyer through its paces for a year before it was commissioned on December 26. His immediate focus will be on conducting trials of the Barak-8 medium range surface-to-air missile system, aviation trials and integrating INS Imphal with the navy's Western Fleet. All other weapons and systems were fully tested before the warship's commissioning, including the extended-range BrahMos supersonic surface-to-surface missile and Varunastra heavy-weight torpedoes. He is a gunnery and missiles specialist.

Commander Zorawar Singh, Executive Officer: He is Choudhury's second-in-command. Singh, 37, is the principal warfare officer of the destroyer and oversees its fighting capabilities in all four domains – air, surface, underwater and electronic. The warship's modern weapon-sensor fit, coupled with its advanced network-centric capabilities, makes it a potent combat platform for fleet operations. The destroyer is equipped with weapons and systems that can take down any kind of aerial threat, has the capability to carry out long-range surveillance and engagement of surface and

land targets, and can attack submarines with torpedoes and rockets. Singh's other responsibilities include the warship's day-to-day functioning, discipline and morale.

Lieutenant Commander Anshu Bhau, Navigating Officer: His charter is twofold: navigation and operations. Bhau handles the navigation of the warship on the high seas, and its movement in and out of the harbour. His job includes supervising the operations room and extracting information on all four dimensions, collating it, summarising and putting it up to the executive officer for further action. A second-generation navy officer, the 33-year-old is from Jammu and was commissioned into service in 2013. Capability-wise, the destroyer is on a par with the world's most advanced warships, he said.

Lieutenant Commander Manjit Kumar, Signal Communications Officer: He is the link to the outside world, responsible for sending and receiving all communication to and from the headquarters, other warships, aircraft and the maritime operations centre. Ensuring the security of communication falls under the 30-year-old's domain. He is also a second-generation navy officer.

Lieutenant Commander Salik Imam, Senior Engineer Officer: He looks after the operation and maintenance of all machinery on board, including propulsion, power generation and auxiliary equipment, including fire-fighting systems and water pumps. The warship has a sophisticated integrated platform management system that amalgamates and automates all machinery, power management and damage control functions on board. Imam is 35 and hails from Gaya in Bihar.

Surgeon Lieutenant Commander Chaitanya Jha, Principal Medical Officer: He oversees the medical facility on board the warship with two beds and an operating table. The facility is equipped with life-saving equipment and medicine chests are stocked to last at least six months. The warship has an integrated telemedicine facility with a direct satellite link to the naval command hospital INHS Asvini in Mumbai. This will allow him to seek the opinion of super specialists for treating personnel on the high seas.

Sub Lieutenant Anjali Mohapatra, Deputy Logistics Officer: She must ensure that the destroyer doesn't run out supplies and is fully equipped at all times to perform the assigned mission – from food to fuel and spares to clothing, Her role is critical as the destroyer will sail out for extended deployments with a crew of 360, including 20 women. The 24-year-old officer is currently the only woman serving on board, and the first woman to be part of a warship's commissioning crew. The navy is set to assign women sailors to INS Imphal in February-March 2024. It is the first warship with separate accommodation for women officers and sailors. It has berthing facilities for eight women officers and 12 Agniveers.

<https://www.hindustantimes.com/india-news/missile-specialist-to-navigation-expert-the-crew-of-ins-imphal-101704082703239.html>



Sun, 31 Dec 2023

Lack of Anti-drone Equipment on Warships Poses Challenge while Guarding Waters

While the Indian Navy has now deployed four destroyers and one frigate to protect merchant shipping from missile and drone attacks in the Arabian Sea, the larger challenge faced by navies across countries is the lack of anti-drone equipment on these warships, according to people familiar with the matter.

This makes merchant ships or oil tankers with no protective measure sitting ducks for the Houthi missiles and Iranian loitering ammunition in the Red Sea, apart from rampaging Somali pirates across the region, the people added.

A frontline frigate of the INS Talwar class is now headed towards the central Arabian Sea to join destroyers INS Kolkata, INS Kochi, INS Chennai and INS Mormugao, which are deployed south of the Arabian Sea to deter missile attacks in the light of recent developments, the people said. INS Visakhapatnam is on standby at the Mumbai harbour as Kamikaze drone-hit tanker MV Chem Pluto is currently undergoing repairs at the Mumbai dockyard.

While one US carrier strike group, French, UK, Spanish, Japanese, Italian and Danish warships are deployed in the Arabian Sea, none of these platforms, like the Indian vessels, have specific anti-drone systems such as high-energy laser or microwave weapons. Though US, UK and French warships have been able to shoot down drones and missiles with long-range guns and surface-to-air missiles, none of these platforms use jamming or spoofing techniques as they interfere with communication. Even Indian warships have long-range guns and SAMs to shoot down drones.

HT has learnt that friendly navies have formed a sort of corridor from the southern Red Sea to the western coast of India to protect the sea lanes, with dhows or suspicious vessels not allowed to enter this zone in the Arabian Sea. Indian warships are also approaching suspicious vessels, and navy sailors are boarding and checking them for weapons and loitering ammunition.

Apart from ships, the US, French and Indian navies are also using long-range drones for maritime domain awareness, apart from surveillance aircraft and helicopters to ensure that merchant shipping and oil tankers can transverse the red zone.

<https://www.hindustantimes.com/india-news/lack-of-anti-drone-equipment-on-warships-poses-challenge-while-guarding-the-waters-101703960648689.html>



Sun, 31 Dec 2023

From Submarines to Fighter Jets: Big-ticket Defence Deals on Agenda as Modi set to Host Macron on R-Day

With Prime Minister Narendra Modi set to host French President Emmanuel Macron a few weeks later, New Delhi and Paris may finalise deals on India procuring 26 Rafale Marine combat aircraft from France as well as on the construction of three submarines in India with the transfer of technology from France.

The two sides are also expected to adopt a roadmap for defence-industrial cooperation. New Delhi and Paris are keen to step up defence cooperation through partnership in the design, development, testing and manufacture of advanced defence technologies and platforms and expand joint production of military hardware in India with technology transferred from France, including for third countries in the Indo-Pacific and beyond.

Macron will visit New Delhi to be the chief guest at India's 75th Republic Day ceremony on January 26. He will have meetings with Modi and President Droupadi Murmu apart from witnessing the military parade on the Kartavya Path.

The meeting between Modi and Macron may see progress on the big-ticket defence deals, including the procurement of 26 Rafale-M fighter jets from Dassault Aviation of France for the Indian Navy.

A source in New Delhi told DH that the negotiation for an intergovernmental agreement for India to procure 22 single-seat and four dual-seat marine combat aircraft from Dassault Aviation of France had gained momentum over the past few months.

A day before Modi attended the Bastille Day parade in Paris on July 14 on an invitation from Macron, the Defence Acquisition Council (DAC) of the Government of India granted the grant of Acceptance of Necessity (AoN) for the procurement of the 26 Rafale Marine aircraft for the Indian Navy from the Dassault Aviation of France, along with associated ancillary equipment, weapons, simulator, spares, documentation, crew training and logistic support.

The Rafale M fighter jets are being procured primarily for the INS Vikrant, the Indian Navy's first indigenous aircraft carrier, which was commissioned on September 2, 2022. Some of the aircraft are also likely to be deployed on the INS Vikramaditya – the other carrier of the Indian Navy.

The proposed intergovernmental agreement was on the agenda of discussion when Modi and Macron met in Paris, but a deal could not be clinched then.

It was also discussed when Macron and Modi met in New Delhi on September 10 on the sideline of the 18th G20 summit.

Eric Trappier, the Chief Executive Officer of Dassault Aviation, visited New Delhi on October 9 and 10 and met top officials of the Government of India.

In response to a Letter of Request for the acquisition of the 26 Rafale M aircraft from India, France recently sent a Letter of Acceptance, with the pricing and other details offered by it. The final deal will be clinched after the negotiation between New Delhi and Paris over pricing concludes.

India had earlier purchased 36 Rafale fighter jets for the Indian Air Force under an intergovernmental agreement inked with France in September 2016.

Macron's forthcoming visit to New Delhi and his meeting with Modi may also see the two sides making progress on the proposed deal between Mazagon Dock Shipbuilders Limited of India and the Naval Group of France for the construction of three additional submarines – as a follow-up to the construction of six Kalvari-class – an export derivative of the Scorpène-class of France – diesel-electric submarines for the Indian Navy under New Delhi's acquisition programme 'Project 75'.

<https://www.deccanherald.com/india/india-france-defence-deals-on-agenda-as-modi-set-to-host-macron-on-republic-day-2830760>



Mon, 01 Jan 2024

Indo-UAE Military Collaboration in 'Desert Cyclone 2024'

India and the UAE are set to engage in their inaugural joint military exercise, 'Desert Cyclone 2024,' aimed at enhancing interoperability through knowledge exchange in urban operations. The two-week-long exercise, scheduled from January 2 to January 15, will unfold in the arid terrains of Rajasthan.

As per the official communication from the Additional Directorate General of Public Information (ADGPI) of the Indian Army, shared on social media, the exercise seeks to bolster interoperability by sharing insights and refining practices in urban warfare.

Collaborative military exercises play a crucial role in constructive engagements, offering an opportunity for participating nations to exchange current tactical and technological practices. This, in turn, contributes to the continual improvement and modernization of military operations.

The longstanding friendship between India and the UAE, rooted in cultural, religious, and economic interactions spanning millennia, forms a solid foundation for such collaborations. The Ministry of External Affairs identifies potential areas of bilateral cooperation, including the production and development of defense equipment, joint exercises, information sharing on strategy and doctrines, and technical cooperation.

Recent times have witnessed significant growth in defense collaboration between India and the UAE, focusing on training, the supply of defense inventory, and regular exchange programs. Milestones include the India-UAE Joint Air Forces exercise in 2008 and naval exercises like 'Zayed Talwar,' showcasing the expanding scope of defense interactions.

India actively participates in the biennial International Defence Exhibition (IDEX) in Abu Dhabi, emphasizing its commitment to engaging with the global defense community. Regular high-level and functional exchanges between India and the UAE, coupled with naval port calls, demonstrate the steady growth of bilateral defense cooperation.

As both nations continue to strengthen their defense ties, the 'Desert Cyclone 2024' exercise serves as a testament to evolving collaboration, facilitating shared learning and mutual growth in military capabilities.

The exercise aligns with the broader strategy of joint military exercises with friendly nations, leading to constructive engagements and enhanced skills for armed forces. These exercises involve the exchange of current tactical and technological practices, contributing to the continual refinement of military operations.

The robust friendship between India and the UAE, deeply rooted in cultural, religious, and economic interactions spanning millennia, forms a solid foundation for such collaborations. The Ministry of External Affairs identifies potential areas of bilateral cooperation in the defense field, emphasizing joint exercises, information sharing, and technical cooperation.

Recent years have witnessed a substantial uptick in defense collaboration between India and the UAE, particularly in defense training, the supply of defense inventory, and the implementation of regular exchange programs. A notable milestone in this partnership was the inaugural India-UAE Joint Air Forces exercise in 2008, held at the Al-Dhafra base in Abu Dhabi.

India's active participation in the biennial International Defence Exhibition (IDEX) in Abu Dhabi underscores its commitment to engaging with the global defense community. Regular high-level and functional exchanges between India and the UAE, along with naval port calls, exemplify the steady growth of bilateral defense cooperation.

This exercise, 'Desert Cyclone 2024,' stands as a testament to the evolving collaboration, fostering shared learning and mutual growth in military capabilities. As both nations deepen their defense ties, they contribute to regional stability and reinforce diplomatic relations. The commitment to joint military exercises reflects a shared vision for peace and security, underscoring the significance of partnerships in addressing contemporary security challenges.

<https://www.financialexpress.com/business/defence-indo-uae-military-collaboration-in-desert-cyclone-2024-3352194/>

India, Russia Talk Small Modular Reactors, Pushes for Kudankulam Completion

India and Russia have decided to expand their civilian nuclear cooperation, with Moscow willing to share technology for a small modular reactor used in power generation, even as both sides are pushing towards the completion of Phase 1 the of 6,000MW Kudankulam nuclear power project in Tamil Nadu, according to people familiar the matter. The small modular reactors – these are advanced nuclear reactors -- have a power generation capacity of 75MW to 300MW.

India's external affairs minister S Jaishankar completed his five days visit to Russia today, and the people cited above said that the two sides are pushing to commission Reactors 3 and 4 while speeding up the work on Reactors 5 and 6 at the Kudankulam nuclear project at a time when the US Westinghouse-supported 6,600MW Kovvada nuclear project and the French Areva-supported 9,900 MW Jaitapur nuclear project are stalled over price negotiations. Only Reactors 1 and 2 of Kudankulam are operational at the moment, providing 2,000MW of electricity to the country.

While Jaishankar met Russian deputy prime minister Denis Manturov and foreign minister Sergey Lavrov, he had a rare and unexpected interaction with Russian President Vladimir Putin on December 27. It is understood that Prime Minister Narendra Modi expressed his regret to Putin for not making it to Moscow for the annual summit this year due to his commitments towards the G20 summit, with an assurance that the 2024 summit would go ahead.

Jaishankar's visit to Russia comes at a time when the latter takes over the presidency of the BRICS platform, and the two countries are looking at future joint ventures in the military systems on the lines of the Brahmos missile and AK-203 rifle projects under the "Aatmanirbhar Bharat" (self-reliant India) rubric. One of the areas of a possible joint venture is the manufacture of Kamov 226 T multi-purpose helicopters, the people cited above said.

While President Putin has appreciated India's strategic autonomy under Modi, New Delhi has managed to maintain close ties with Moscow without China coming into the bilateral equation. Russia supplies nearly 65% of Indian military hardware, and it is understood that the two sides need to firm up spare parts supplies that have been hit by delays due to Russia's war with Ukraine. While three out of five S-400 surface-to-air missile systems have been delivered by Russia to India, New Delhi is looking at receiving an Akula-class nuclear-powered attack submarine on a long-term lease from Moscow in 2025, the people said.

In the backdrop of Iran-backed Houthis attacking commercial shipping in the Red Sea and the Arabian Sea, India is also holding talks with Russia to explore the northern sea route in the worst-case scenario. One fallout of global warming caused by the climate crisis is that the northern sea route for commercial shipping for may be usable for a larger part of the year without fear of encountering ice and inclement weather. While India has investments in the oil and gas sector in northern Russia, it was President Putin who supplied crude to India at discounted rates to ensure that oil prices did not catch fire due to Ukraine war.

<https://www.hindustantimes.com/india-news/india-russia-talk-small-modular-reactors-pushes-for-kudankulam-completion-101703904056651.html>

US Navy Helicopters Sink 3 Houthi Boats in 'Self-defence' in Red Sea

U.S. Navy helicopters from the USS Eisenhower and USS Gravelly responded to a distress call from the Maersk Hangzhou. The Singapore-flagged Hangzhou issued a distress call at about 6:30 a.m. local time, reporting four Houthi small boats attacking.

"The small boats, originating from Houthi-controlled areas in Yemen, fired crew-served and small arms weapons at the MAERSK HANGZHOU, getting to within 20 meters of the vessel, and attempted to board the vessel," according to Central Command.

Firefight in the Red Sea: How it unfolded

Houthi boats, armed with crew-served weapons, approach within 20 meters of the Maersk ship. U.S. helicopters issued verbal warnings, but the Houthi boats open fired, leading to a fierce exchange. While "in the process of issuing verbal calls to the small boats, the small boats fired upon the U.S. helicopters with crew-served weapons and small arms," says Central Command.

Service members aboard the Navy helicopters return fire, sinking three of the four small boats and killing the crews. The fourth boat flees the area.

Impact on global shipping and security

The clash marks the 23rd Houthi attack in six weeks, raising concerns for companies transiting the Red Sea. Maersk pauses transits for 48 hours, assessing security, as incidents prompt some to reroute around the Cape of Good Hope. The U.S. establishes Operation Prosperity Guardian, a naval task force ensuring safe passage for commercial ships.

Houthis, conflict, and global ramifications

Houthi attacks escalate amid conflicts in the Middle East, with implications for global shipping routes. The incident sheds light on the intersection of personal beliefs, industry fallout, and the power of social media in today's interconnected world.

The U.S. military has not struck directly at the Houthis in Yemen, wary of an escalation that could cause the war in Gaza to further inflame the Middle East.

<https://www.hindustantimes.com/world-news/us-news/us-navy-helicopters-sink-3-houthi-boats-in-self-defence-in-red-sea-101704022183359.html>

China Appoints New Defence Minister, 2 Months after Ousting 'Missing' Li Shangfu

China on Friday appointed Dong Jun as its new defence minister, replacing Li Shangfu who was ousted two months ago without any explanation after he went missing since August. The appointment of the new defence minister came as Chinese President Xi Jinping is upgrading the

military as part of his push to make China a dominant world power, an aim that has alarmed many neighbours.

Dong, 62, was most recently the People's Liberation Army (PLA) navy chief. Before this, he has served in all major divisions in the PLA including the Northern Sea Fleet, Eastern Sea Fleet, as well as the Southern Command Theatre, reported local media.

Notably, the role of China's defence minister is to be the public face of the PLA in its engagement with the media and with other militaries, reported Reuters. However, unlike other countries, the ministry does not have a lot of say in defence policy or military management.

What happened to Li Shangfu?

In October this year, China removed Li Shangfu from his position as defence minister and state councillor without any explanation. He took up the defence minister job in March but had not been seen in public since August 25. According to reports, Li was under US sanctions related to his overseeing weapon purchases from Russia that bar him from entering the country. Since then, China cut off contact with the US military, mainly in protest over Washington's arm sales to Taiwan.

During Li's tenure as well, he did not meet his US counterpart due to the sanctions. Notably, a crucial element of China's defence minister's job is to engage with the US military to lower the risk of conflict over Taiwan and the South China Sea.

Meanwhile, Li was the second minister to be removed abruptly since Xi began his unprecedented third term last year. In July, Qin Gang was replaced as foreign minister by his predecessor Wang Yi, after a similar unexplained withdrawal from public engagements.

<https://www.hindustantimes.com/world-news/china-appoints-new-defence-minister-2-months-after-ousting-missing-li-shangfu-101703847363559-amp.html>

Science & Technology News



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Ministry of Science & Technology

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Perovskite Self-powered Broadband Photodetector with Reduced Lead Toxicity can Help Sustainable Energy

Indian scientists have indigenously developed organic-inorganic halide perovskite self-powered broadband photodetector with partial substitution of lead by magnesium which can be useful for solar energy generation.

Organic-Inorganic halide perovskite (Methyl Ammonium Lead Iodide, MAPbI₃) has been the frontrunner of optoelectronic research, showing promise in solar cells, LEDs, and photodetectors. However, hybrid perovskite has been plagued by significant issue due to presence of toxic lead (Pb²⁺), which is known for harmful effects on health and the environment.

In a significant study, researchers from the International Advanced Research Centre for Powder Metallurgy & New Materials (ARCI), Hyderabad, an autonomous institute of Department of Science and Technology (DST) have addressed these challenges by introducing an eco-friendly alternative to replace toxic Lead (Pb). The team turned to Mg, an alkaline earth metal known for its non-toxic nature and abundance, as a substitute to lead.

They synthesised the $\text{MAPb}_x\text{Mg}_{1-x}\text{Cl}_2\text{I}$ perovskite using one-step anti-solvent approach. They carefully tuned the Mg^{2+} stoichiometry and achieved tetragonal perovskite phase with desired properties. They also fabricated the photodetector in a simplified architecture (FTO/ TiO_2 /Perovskite/Carbon), unlike traditional architecture (FTO/ TiO_2 /Perovskite/HTL/Gold) that contains expensive metal cathode (gold). It lead to an economic and robust configuration.

The optimized $\text{MAPb}_{0.5}\text{Mg}_{0.5}\text{Cl}_2\text{I}$ perovskite delivered outstanding responsivity of 153.74 mA/W, a high detectivity of 6.5×10^{10} Jones, and a fast response/recovery time of 411 ms/50 ms at ZERO bias as shown in Figure 2.

This innovative research represents a significant step towards the replacement of toxic Pb^{2+} in perovskite optoelectronic devices. The successful demonstration of $\text{MAPb}_{0.5}\text{Mg}_{0.5}\text{Cl}_2\text{I}$ -based photodetectors not only showcases the potential of magnesium substitution but also reinforces the drive for development of eco-friendly and sustainable technologies. In a world where several environmental concerns are rising, this study paves the way for a greener future in optoelectronics. This is possible by swapping-out toxic lead for benign magnesium, thus researchers have offered a promising alternative for photodetectors and other optoelectronic devices.

Publication link: doi.org/10.1039/D3MA00411B

<https://pib.gov.in/PressReleasePage.aspx?PRID=1991433>



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Mushroom Derived Bioactive Compounds have Potential to Combat COVID-19 and other Viral Infections

Natural anti-infective, antiviral, anti-inflammatory, and antithrombotic products derived from a wide range of easily sourced mushrooms and their bioactive molecules have the potential to combat covid, according to a new paper.

The COVID-19 pandemic brought the focus on bioactive ingredients that boost the immune system. Consequently, scientists worldwide resumed intensive studies on bioactive compounds that can boost the immune system to protect against SARS-CoV-2 and limit the accelerated transmission of this virus. Consequently, bioactive compounds from herbal sources and edible mushrooms gained commercial interest due to their easy availability, high antioxidant activity, nutritional value, and low side effects.

Mushrooms are a popular source of food and North-East India is home to diverse groups of edible mushrooms. This increasing popularity of mushrooms led researchers from IASST, an autonomous institute of Department of Science and Technology (DST) to critically analyse the importance of

edible mushroom and natural compounds from mushroom to attenuate the complications against COVID-19 and other viral infections.

Research group lead by Prof. Ashis K Mukherjee, Director, IASST including Dr. Aparup Patra, Dr. M. R. Khan, Dr. Sagar R. Barge, and Mr. Paran Baruah from IASST, Guwahati carried out an analysis of the current therapies against COVID-19 versus the potential of natural anti-infective, antiviral, anti-inflammatory, and antithrombotic products derived from a wide range of easily sourced mushrooms and their bioactive molecules.

In the review article the scientists have assessed the roles and mechanisms of 13 different mushroom-derived bioactive compounds in preventing SARS-CoV-2 infection and the pathophysiology associated with its infection, such as lung infection, inflammation, cytokine storm, and thrombotic and cardiovascular effects.

Their study said that mushrooms contain bioactive polysaccharides and compounds with immunomodulating, antiviral, antibacterial, antifungal, and other medicinal properties. It also said that mushroom-based drugs are being tested in human trials, with promising results against SARS-CoV-2.

The main advantages of using edible mushroom against viral infections are- they can be used as a nutraceutical supplement with no side-effects and can be act as an immunity booster.

The study in the Journal of Fungi also suggests that there are huge opportunities for better understanding the role of mushroom-derived bioactive compounds by in-depth pre-clinical and clinical studies. In this regard a coordination between researcher, health professionals, and policymakers are warranted.

Publication Link: <https://doi.org/10.3390/jof9090897>

<https://pib.gov.in/PressReleasePage.aspx?PRID=1991432>



Sat, 30 Dec 2023

SpaceX Launches Secretive U.S. Military Spacecraft on Research Mission

SpaceX's Falcon Heavy rocket blasted back into space on Thursday night to ferry the U.S. military's secretive X-37B drone to a research mission.

After weeks of delays, the rocket launched from NASA's Kennedy Space Center in Florida at 8:07 pm Eastern Time (0107 GMT Friday) in a liftoff livestreamed on SpaceX's website.

It is unclear where exactly the uncrewed and autonomously operating spacecraft is headed on its seventh mission.

The Pentagon has released little information about the space drone and its mission, which was initially scheduled for December 7, and SpaceX only cited the Pentagon's mission code name — USSF-52 — in its statement on the launch.

"Falcon Heavy launched the USSF-52 mission to orbit from Launch Complex 39A," SpaceX said.

Earlier, the Pentagon had said the X-37B's seventh mission would entail "multiple cutting-edge experiments".

“These tests include operating the reusable spaceplane in new orbital regimes, experimenting with future space domain awareness technologies, and investigating the radiation effects on materials provided by NASA,” the U.S. Department of the Air Force Rapid Capabilities Office said in a statement last month.

It added that this is the first time the X-37B is lifting off on a Falcon Heavy, one of the most powerful operational rockets, capable of carrying payloads of up to 26,700 kilograms (58,900 pounds) deep into space.

About the size of a small bus, the X-37B U.S. space drone looks like a mini version of the manned space shuttles retired in 2011. On previous missions, the X-37B has carried out tests for NASA on the impact of radiation on seeds and other materials.

The Falcon Heavy launch comes two weeks after China sent its own secretive robotic space plane, called Shenlong, into orbit for what state news agency Xinhua said would be a “period of time”.

“During this period, reusable technology verification and space science experiments will be carried out as planned to provide technical support for the peaceful use of space,” Xinhua said after the December 14 launch.

In operation since 2010, the X-37B Orbital Test Vehicle was designed for the Air Force by United Launch Alliance, a joint venture between Boeing and Lockheed Martin.

It is 30 feet (nine meters) long, has a 15-foot wingspan and is powered by solar panels.

<https://www.thehindu.com/news/international/spacex-launches-secretive-us-military-spacecraft-on-research-mission/article67688210.ece>

