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रक्षा विज्ञान पुस्तकालय
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अब्दुल कलाम द्वीप से अग्नि-5 मिसाइल का सफल परीक्षण,

5,000km तक लक्ष्य भेदने में सक्षम

ओडिशा तट के पास डॉक्टर अब्दुल कलाम द्वीप से स्वदेश में विकसित, सतह से सतह पर मार करने वाली, बैलिस्टिक मिसाइल अग्नि 5 का सफल प्रायोगिक परीक्षण किया गया।

यह मिसाइल 5,000 किलोमीटर की दूरी तक लक्ष्य को भेद सकता है।

हाइलाइट्स

- भारत ने परमाणु हथियार ले जाने में सक्षम अग्नि-5 मिसाइल का सफल परीक्षण किया
- ओडिशा तट के पास डॉक्टर अब्दुल कलाम द्वीप से अग्नि-5 मिसाइल का परीक्षण
- सतह से सतह पर मार करने वाली बैलिस्टिक मिसाइल अग्नि-5 भारत में ही विकसित
- 5,000 किमी की दूरी तक लक्ष्य भेदने में सक्षम, 3 चरणों में मार करने वाली मिसाइल

भुवनेश्वर: भारत ने ले जाने में सक्षम का ओडिशा तट से सोमवार को सफल परीक्षण किया। यह परीक्षण ओडिशा तट के पास से किया गया। सतह से सतह पर मार करने वाली बैलिस्टिक मिसाइल को भारत में ही विकसित किया गया है।

रक्षा सूत्रों ने बताया कि स्वदेश में विकसित इस मिसाइल का यह सातवां परीक्षण है और यह मिसाइल 5,000 किलोमीटर की दूरी तक लक्ष्य भेदने में सक्षम है। जानकारी के अनुसार, अग्नि-5 तीन चरणों में मार करने वाली मिसाइल है जो 17 मीटर लंबी, दो मीटर चौड़ी है और 1.5 टन तक के परमाणु हथियार ले जाने में सक्षम है।

अधिकारियों के मुताबिक, इस श्रृंखला की अन्य मिसाइलों के उलट अग्नि-5 मार्ग और दिशा-निर्देशन, विस्फोटक ले जाने वाले अगले हिस्से और इंजन के लिहाज से सबसे उन्नत है। एक रक्षा सूत्र ने बताया, 'इस मिसाइल का परीक्षण सोमवार दोपहर बंगाल की खाड़ी के डॉ अब्दुल कलाम द्वीप पर इंटीग्रेटेड टेस्ट रेंज (आईटीआर) के लॉन्च पैड संख्या चार से एक मोबाइल लॉन्चर से किया गया।'

पिछला परीक्षण तीन जून, 2018 को हुआ था

रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) के अधिकारियों के मुताबिक इस मिसाइल को लक्ष्य बिंदु को सटीकता से भेदने के लिए डिजाइन किया गया है। यह मिसाइल उसमें लगे कंप्यूटर से निर्देशित होगा। सामरिक बल कमान और रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) द्वारा विकसित मिसाइल नौवहन और निर्देशन, मुख्यास्त्र और इंजन के संदर्भ में बहुत उन्नत है। यह अत्याधुनिक अग्नि-5 बैलिस्टिक मिसाइल का सातवां परीक्षण था। इसका पिछला परीक्षण तीन जून, 2018 को हुआ था।

India successfully test-fires nuclear-capable Agni-5

Agni 5 is the country's longest range missile with a proven hit capability, which has evinced reactions and concerns from China

By M Somasekhar

Hyderabad: India's defence scientists have successfully launched Agni 5, the nuclear-capable ballistic missile, with over 5,000 km range, three times during 2018.

The trial on Monday afternoon, the 7th of the indigenously developed surface to surface missile from the Dr Abdul Kalam Island (earlier Wheeler Island), off the Odisha coast on Monday met all expectations of the users and on the technology front, DRDO sources said.



Today's trial was a canister based, mobile launch. During 2018, Agni 5 was tested in January, June and December this year. All three have proved to be smooth one's. The Agni 5, developed by labs under the Missile Complex in Hyderabad and several industries across the country was first flight tested in 2012.

Agni 5 is the country's longest range missile with a proven hit capability, which has evinced reactions and concerns from China. It is a three stage missile, 17 metres tall, two metres wide and capable of carrying upto 1.5 tonne of payload, especially nuclear warheads. Of the seven launches five are road mobile canister types, which give the missile a flexibility and higher ranges.

The missile was launched from the latest test pad in the Integrated Test Range (ITR). The flight test was witnessed by top DRDO officials, including the Director General & Scientific Adviser to Defence Minister, G Sateesh Reddy, officials of the Strategic command force of the Military etc.

The repeated tests carried out in the past few years have established a range of technologies, especially the navigation and guidance, onboard computer & electronics, indigenous Ring Laser-Gyro based inertial navigation system, avionics, engine and the warhead with the intent of sharpening the overall accuracy in hitting the target.

The Advanced Systems Laboratory (ASL), Research Centre Imarat (RCI), Defence Research Development Laboratory (DRDL), all in the Missile Complex in Hyderabad have played an important part in the development of various technologies, integration of the missile and testing.

Under the Integrated Guided Missile Development Programme (IGMDP) launched in 1983, the DRDO has so far developed and tested Agni-1, with 700 km range, Agni-2 (2,000-km), Agni-3 (2500 kms plus) and Agni-4 (3,500 kms plus range). The Agni 1&2 have been inducted while others are in various stages of tests and induction.

<https://www.thehindubusinessline.com/news/national/india-successfully-test-fires-nuclear-capable-agni-5/article25709867.ece>

India test fires nuclear capable Agni-5 missile, 2nd test in six months

New Delhi: Indigenously developed surface-to-surface ballistic missile Agni-5 has been successfully test-fired from Dr Abdul Kalam Island off Odisha coast, according to reports.

The surface-to-surface missile having a strike range of 5,000 km was launched at 1.30 p.m. from the Integrated Test Range (ITR) in Bhadrak district, said Defence Ministry sources. This is the seventh trial of the indigenously-developed surface-to-surface missile, they further added.

Agni-5 is a three stage missile and is 17 metre tall and 2 metre wide. It is capable of carrying 1.5 tonne of nuclear warheads.

"The missile was launched with the help of a mobile launcher from launch pad-4 of the Integrated Test Range (ITR) at Dr Abdul Kalam Island in the Bay of Bengal on Monday afternoon," said a defence source.

"It was an user associated trial. Strategic force command along with DRDO scientists conducted it," the source added.

During this trial, the flight performance of the missile was tracked and monitored by radars, tracking instruments and observation stations, said the source.

"The high-speed on-board computer and fault-tolerant software, along with robust and reliable bus guided the (Agni-5) missile flawlessly (during the test)," an official said.

The missile is programmed in such a way that after reaching the peak of its trajectory, it turns towards the earth to continue its journey to the target with an increased speed, due to the earth's gravitational pull, and its path precisely directed by the advanced on-board computer and inertial navigation system.

As the missile enters the earth's atmosphere, the atmospheric air rubbing its outer surface skin raises the temperature to beyond 4,000 degree Celsius. However, the indigenously-designed and developed heat shield maintains the inside temperature at less than 50 degree Celsius.

Finally, commanded by the on-board computer with the support of laser gyro-based inertial navigation system, micro inertial navigation system (MINS), fully digital control system and advanced compact avionics, the missile hit the designated target point accurately, meeting all mission objectives, the sources said.

The ships located in mid-range and at the target point tracked the vehicle and witnessed the final event.

All the radars and electro-optical systems along the path, monitored the parameters of the missile and displayed them in real time.

The first two flights of Agni-5 in 2012 and 2013 were in open configuration. The third, fourth and fifth launch were from canister integrated with a mobile launcher, that enables launch of the missile in a shorter time as compared to an open launch.

The nuclear capable missile is expected to be inducted into India's Strategic Forces Command soon and this was its third successful test this year. The last test was held in June 2018.

Unlike other missiles of the series, Agni-5 is the most advanced with new technologies in terms of navigation and guidance, warhead and engine, a Defence Research and Development Organisation (DRDO) official had said in June 2018.

The missile has a payload capacity of 1,500 kg of high-explosive warhead and once inducted in the military, India will join an exclusive club of countries like the US, Russia, China, France and Britain which have intercontinental ballistic missile capabilities.

The missile is being inducted at a time when India's neighbourhood is witnessing evolving security threats.

In its armoury, India currently has Agni-1 with 700 km range, Agni-2 with a 2,000-km range, Agni-3 and Agni-4 with 2,500 km to more than 3,500-km range.

The first test of Agni V was conducted on April 19, 2012.

<https://economictimes.indiatimes.com/news/defence/india-test-fires-nuclear-capable-agni-5-missile-2nd-test-in-six-months/articleshow/67023684.cms>

HAL test-flies light copter up to 6km

Hindustan Aeronautics Limited (HAL) built Light Utility Helicopter (LUH) has achieved an important milestone of flying at 6 km altitude here in Bengaluru, recently. The chopper was flown by Chief Test Pilot Wg Cdr (Retd) Unni K Pillai and Test Pilot, Wing Cdr (Retd) Anil Bhambhani.

According to a HAL press release the flight was carried out under the envelope expansion tests and flying at 6 km altitude is a critical requirement towards the certification of LUH. The helicopter exhibited satisfactory performance and handling qualities. With the completion of this milestone, LUH can now undertake high altitude cold weather trials planned in January 2019.

The LUH is a 3-ton class new generation helicopter designed and developed by Rotary Wing Research and Design Center (RWR&DC) of HAL to replace the ageing Cheetah and Chetak helicopters used by Indian Armed Forces. First flight of LUH PT-1 was carried on September 6, 2016 and the second Prototype flew on May 22, 2017. HAL has in principal order for 187 LUH that includes 126 for Indian Army and 61 for IAF.

The LUH is being indigenously developed by HAL to meet the requirements of both military and civil operators. The helicopter with Glass Cockpit can be deployed for Reconnaissance, Surveillance roles and as a light transport helicopter. The helicopter will be capable of flying at 220 Km/h, with a service ceiling of 6.5 Km and a range of 350 Km with 400 kg payload. The LUH is powered by TM/HAL Ardiden 1U/Shakti 1U single turbo shaft engine with sufficient power margins to cater to demanding high altitude missions.



HAL's Light Utility Helicopter clears 6-km flight test

The recent feat achieved in Bengaluru is a critical requirement for certifying the 3-tonne helicopter for use

The multi-purpose Light Utility Helicopter (LUH) that is under development has achieved an important milestone of flying at 6 km altitude.

"The helicopter exhibited satisfactory performance and handling qualities. With the completion of this milestone, the LUH can now undertake high altitude cold weather trials planned in January 2019," its creator, Hindustan Aeronautics Ltd, said on December 10.

The LUH has been undergoing tests to expand its envelop. The recent feat achieved in Bengaluru is a critical requirement for certifying the 3-tonne helicopter for use. Built to fly over high altitude areas, the LUH has a maximum permitted height limit of 6.5 km.

HAL already has two in-principle orders for a total of 187 LUHs - 126 for the Army and 61 for the Air Force. Apart from military surveillance and reconnaissance roles, it can also serve as a light civil transport helicopter.

The LUH is being designed and developed by HAL's Rotary Wing Research and Design Centre to replace the aged Cheetah and Chetak helicopters of the Armed Forces.

HAL's Chief Test Pilot Wg. Cdr. (Retd) Unni K. Pillai and Test Pilot Wg. Cdr. (Retd) Anil Bhambhani flew the copter.

The LUH's first prototype, PT-1, first flew on September 6, 2016, and the second prototype flew on May 22, 2017.

Indo-US air exercise to prepare for joint ops

30 aircraft are taking part in Cope India 18's last phase, spread over five days

By Shubhadeep Choudhury

The third edition of the joint exercise of air forces of India and USA, Cope India 18, entered the last and most crucial phase today. As many as 30 aircraft of both forces are taking in this phase that will last five days.

The last phase of the exercise, which started on December 4, will consist of advanced beyond visual range (ABVR) target engagements by both forces.

Twenty-one IAF fighter-bombers — 10 Sukhois, six Mirage and five Jaguars — are taking part in the exercise while from the US side 12 F-15 fighters are participating.

Air Commodore J S Mann, IAF exercise director, said: “At each phase of the exercise the number of aircraft go up. In ‘within visual range’ exercises no more than two aircraft take off at a time. As we go to the next phase, the number of aircraft goes up.”

Besides, three C-130H transport aircraft and two C-130J transport aircraft have been deployed by USA and India, respectively, for the exercise which will go on till December 14. The transport aircraft, used for shipping equipments required for the exercise, have been stationed at the IAF Base at Panagarh. The IAF has deployed the indigenously developed AEW&CS integrated with a Brazilian Embraer aircraft for the drill.

As many 550 crew members, including 150 from the US air force, are taking part in the exercise which is happening after 13 years. While the first Cope India had taken place in Gwalior in 2004, the next one took place in Kalaikunda in 2005.

US air force exercise director Colonel Darryl Insley, while profusely praising the professionalism of the IAF pilots, said this kind of exercises prepares for future joint operations. Similar sentiments were also expressed by officials representing the Indian side. However, both Indian and US officials were careful not to mention China as a possible factor bringing India and USA closer. Interestingly, two military pilots from Japan are also taking part in the exercise as observers.

<https://www.tribuneindia.com/news/nation/indo-us-air-exercise-to-prepare-for-joint-ops/696149.html>



Admiral Grigorovich-class frigates likely to be inducted in next three years

Rear Admiral Dinesh K. Tripathi says two will be built in Russia and two at Goa Shipyard

By Sumit Bhattacharjee

The first of the four Admiral Grigorovich-class (Project 11356) guided missile stealth frigates is likely to be inducted into the Indian Navy in the next three years.

This was disclosed by Rear Admiral Dinesh K Tripathi, Flag Officer Commanding, Eastern Fleet, here on Monday.

In an informal chat with The Hindu, after addressing a joint press meet, as part of the ongoing INDRA-NAVY-18, the bilateral maritime exercise between Indian Navy and Russian Federation Navy, that began on Sunday, he said two of the frigates that are advanced version of the Indian Talwar-class guided missile frigates, will be built in Russia's Baltic Coast Yantar Shipyard and the remaining two will be built at Goa Shipyard on technology transfer.

It is learnt that the Admiral Grigorovich-class frigates will have an array of weapon system that include artillery guns, strike missile and radar-controlled air defence systems with provisions for torpedo tubes.

Sources also said that the 4,000-odd tonne frigates can be armed with Brahmos cruise missile system.

Medium refit

On Russia-India defence cooperation it is understood that right now two Sindhughosh-class submarines, reportedly Sindhukesari and Sindhuraj, are undergoing medium refit at a shipyard in Russia and post which the active operational lifespan of the subs will be enhanced for a further period of 7 to 10 years. The combat power of the Kilo-class diesel-electric submarines will also be enhanced substantially after the refit.

It is also understood that a second Akula-class nuclear-powered attack submarine (SSN), may also be leased to India by the Russian Federation Navy. India already operates a leased Akula-class SSN, INS Chakra, which is based at Eastern Naval Command.

Enhanced cooperation

Speaking about cooperation between the two countries, Rear Admiral Mikhailov Edward Evgenievich, Chief of the Headquarters, Submarine Forces, Pacific Fleet, of Russian Federation Navy, said that both the countries envisage a common goal of more security and stability in the oceans and such bilateral exercise will further deepen such cooperation.

He also said that both the countries have conducted such exercises in the past involving the tri-services, and such roles involving the submarines is envisaged in the future.

The INDRA NAVY-18 began on Sunday, and after the harbour phase, the sea phase will be held from December 13 to 16. While the ships from Russian Federation Navy, include Destroyer Admiral Panteleyev, guided missile cruiser Varyag and fleet tanker Boris Butoma, the India flotilla include INS Ranvir, a guided missile destroyer, INS Satpura, an indigenous frigate, INS Kadmatt, an indigenous anti-submarine warfare (ASW) corvette, IN Ships Kuthar and Khanjar both indigenous missile corvettes and INS Jyoti, a fleet tanker, various fighter and reconnaissance aircraft, helicopters and submarines.

Apart from conferences, profession interactions, cultural visits, the exercise will also focus on anti-submarine warfare (ASW), air defence drills, surface firings and search and seizure operations.



Tue, 11 Dec 2018

World's largest particle smasher takes 2-year break: CERN

GENEVA: The Large Hadron Collider (LHC) — world's most powerful particle accelerator — has been stopped for about two years to enable major upgrades and renovations, CERN said

Operators of the CERN Control Centre turned off LHC on December 3. The operations will resume in 2021. During its second run (2015-2018), the LHC performed beyond expectations, achieving approximately 16 million billion proton-proton collisions at an energy of 13 TeV and large datasets for lead-lead collisions at an energy of 5.02 TeV, CERN said in a statement. These collisions produced an enormous amount of data, with more than 300 million gigabytes now permanently archived in CERN's data centre tape libraries. This is the equivalent of 1,000 years of 24/7 video streaming, researchers said. By analysing these data, the LHC experiments have already produced a large amount of results, extending our knowledge of fundamental physics and of the universe.

2/11/2018 World's largest particle smasher takes 2-year break: CERN - Times of India <https://timesofindia.indiatimes.com/home/science/worlds-largest-particle-smasher-takes-2-year-break-cern/articleshow/67024251.cms> 8/35 Book a stunning home in Gurugram at Rs. 3.77 Lakhs Ad M3M Sierra VISIT SITE Recommended by COLO "The second run of the LHC has been impressive, as we could deliver well beyond our objectives and expectations, producing five times more data than during the first run, at the unprecedented energy of 13 TeV," said Frederick Bordry, CERN Director for Accelerators and Technology.

"With this second long shutdown starting now, we will prepare the machine for even more collisions at the design energy of 14 TeV," Bordry said. "Over the past few years the LHC experiments have made tremendous progress in the understanding of the properties of the Higgs boson," said Fabiola Gianotti, CERN Director-General. "The Higgs boson is a special particle, very different from the other elementary particles observed so far; its properties may give us useful indications about physics beyond the Standard Model," Gianotti said. A cornerstone of the Standard Model of particle physics — the theory that best describes the elementary particles and the forces that bind them together — the Higgs boson was discovered at CERN in 2012 and has been studied ever since. In particular, physicists are analysing the way it decays or transforms into other particles, to check the Standard Model's predictions. Over the last three years, the LHC experiments extended the measurements of rates of Higgs boson decays, including the most common, but hard-to-detect, decay into bottom quarks, and the rare production of a Higgs boson in association with top quarks. During the two-year break, Long Shutdown 2 (LS2), the whole accelerator complex and detectors will be reinforced and upgraded for the next LHC run, starting in 2021, and the High-Luminosity LHC (HL-LHC) project, which will start operation after 2025.

<https://timesofindia.indiatimes.com/home/science/worlds-largest-particle-smasher-takes-2-year-break-cern/articleshow/67024251.cms>