

अक्टूबर
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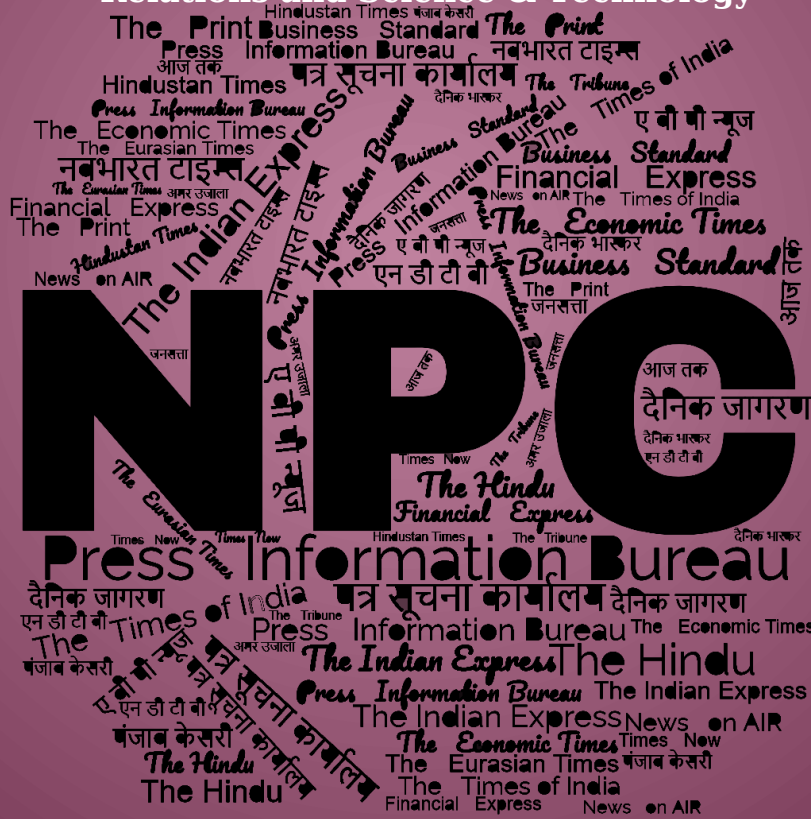
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Press Information Bureau
Government of India

Ministry of Defence

Tue, 17 Oct 2023

Defence Ministry Signs Contract for Construction of the First Indian Coast Guard Training Ship with Mazagon Dock Shipbuilders Ltd, Mumbai

The Ministry of Defence signed a contract for the construction of one Training Ship for the Indian Coast Guard (ICG) with Mazagon Dock Shipbuilders Ltd (MDL), Mumbai at a cost of Rs 310 crore under the Buy (Indian- IDDM) category in New Delhi on October 17, 2023. This is the first dedicated training platform with integral helicopter capabilities that will provide basic sea training to 70 Coast Guard and other international under-trainee officers to prepare these budding mariners on the multi-dimensional maritime aspects of Coast Guard life.

This training ship with advanced and modern high-tech surveillance and monitoring systems will provide profound insight and expertise to the ICG cadets on the challenges at sea while ensuring the security of coastline and offshore assets.

The majority of equipment and systems will be sourced from indigenous manufacturers, including MSMEs. The project envisages to generate significant employment over a period of three years. While meeting the objectives of 'Aatmanirbhar Bharat', the contract would also boost the indigenous shipbuilding capability and help in bolstering maritime economic capabilities.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1968467>



Wed, 18 Oct 2023

Baffle Range at Naval Armament Depot

A baffle range named 'Eklavya' was inaugurated at the Naval Armament Depot (NAD) at Aluva on Monday. Former naval shooter P.T. Raghunath inaugurated the range in the presence of Rear Admiral Upal Kundu CSO (Training) at the Southern Naval Command (SNC).

The six-lane firing range spread over an area of 30,000 sqm was designed by Terminal Ballistic Research Laboratory, Chandigarh, a DRDO laboratory. The facility will provide realistic training, both day and night, to all security personnel and trainees at the SNC, according to a press release.

<https://www.thehindu.com/news/national/kerala/baffle-range-at-naval-armament-depot/article67431567.ece>

After Pangong Tso, Army Moves to Induct Specialized Boats at other Water Bodies in Border Areas

After Pangong Tso in eastern Ladakh, the Army has now kicked off the plan to acquire six fast patrol boats and eight landing craft assault for other water bodies in border areas like Sir Creek and Brahmaputra river basin as well as 118 integrated surveillance and targeting systems for mechanized forces.

The move comes after the Army over the last two years has inducted new specialized boats for patrolling Pangong Tso, the 134-km long lake at an altitude of 13,900-feet in eastern Ladakh, where troop disengagement with China took place on the two banks in February 2021.

The new initial tenders or RFIs (request for information) issued by the Army on Monday for six fast patrol boats and eight landing craft assault are meant for deployment in areas like Sir Creek in the Rann of Kutch in Gujarat as well as Brahmaputra river and Sundarban delta areas of West Bengal. The Army said the fast patrol boats, capable of carrying eight fully-armed soldiers, should be “rugged and versatile to facilitate seamless execution of small team insertion, surveillance, reconnaissance and patrolling”. The landing craft assault, in turn, should be capable of carrying 35 soldiers with weapons and equipment for patrolling, fast attack and interception across a varying matrix of terrain and operating conditions. The last date to respond to the RFIs for the patrol boats and landing assault craft is November 28.

At Pangong Tso, the Army has inducted 12 fast patrol boats with advanced surveillance gear and other equipment under a Rs 65 crore contract with defence PSU Goa Shipyard.

Similarly, 17 troop-carrying, flat-bottom fibreglass boats were inducted from a private shipyard at Goa, which also supplies such vessels to the Navy. These boats can swiftly transport around 20 soldiers from one location to another on the brackish lake. Amid the continuing military confrontation with China in eastern Ladakh, which is now set to enter the fourth successive winter, the People’s Liberation Army has built two bridges on the part of the Pangong lake it controls as well as new troop shelters and jetties near the “no patrol buffer zone” created after the troop disengagement.

<https://timesofindia.indiatimes.com/india/after-pangong-tso-army-moves-to-induct-specialized-boats-at-other-water-bodies-in-border-areas/articleshow/104504528.cms>



Amid Tensions with China, Army Army Plans to Buy Integrated Surveillance and Tracking Systems for Guarding Borders

With troop deployment along the disputed Sino-Indian border becoming a permanent feature, the Indian Army plans to acquire over 100 “integrated surveillance and targeting systems” for border-guarding troops so that they can keep an eye on vehicle movements from across the border and

strike if necessary. While the army needs around 600 such systems, in the first stage a request for information has been issued to buy 118 of them with 60 per cent indigenous content. The Army will also buy more fast patrol boats for operations in rivers and water bodies like Pangong lake in Ladakh. Each surveillance-cum-tracking system consists of a drone, operator control unit that can be integrated in a tank or infantry combat vehicles, loitering munitions and five other components. The requirement is to use them in high altitude areas where temperature can go down to minus 10-20 degrees Celsius.

The force on Tuesday issued a request for information, according to which the unmanned aerial vehicle should be able to operate at a distance not less than 20 km away while the loitering munitions should be at a distance of 15 km.

The loitering time for such munitions should be 15 min and if not fired, they must return home safely. The drone, on the other hand, should have a minimum endurance of 90 min.

Approved by the Defence Acquisition Council in September, the integrated surveillance and targeting system (ISAT-S) was one of the nine capital acquisition items for the armed forces, approved by Defence Minister Rajnath Singh at a cost of Rs 45,000 crore.

The Indian Army also rolled out a process to procure six fast patrol boats and eight landing craft assault (LCA) as part of efforts to enhance its combat capabilities, officials said on Tuesday. The fast patrol boats are being procured primarily for surveillance in large water bodies, including the Pangong lake in eastern Ladakh. The Indian and Chinese troops are locked in a 3.5 year old confrontation at multiple flashpoints along the Line of Actual Control in eastern Ladakh though disengagement had happened in a few friction zones following diplomatic and military talks.

The RFI for fast patrol boats says the vessels should be "rugged and versatile so as to facilitate seamless execution of small team insertion, surveillance, reconnaissance and patrolling" and that they should be capable of operating across a varying matrix of terrain and conditions.

The indigenously-developed boats should have a maximum speed of 29 knots (at sea state level 2) with eight people on board. The initial tender for LCAs said they are planned to be deployed for search and rescue operations in creek areas and river basins.

It said the length of the LCAs should be between 13-14 metres and maximum speed not less than 20 knots. The LCAs are generally used for ferrying troops and can function without a jetty.

Meanwhile, the Defence Ministry on Tuesday signed a Rs 310 crore agreement with Mazagon Dock Ltd for the construction of the first dedicated training ship for the Indian Coast Guards.

<https://www.deccanherald.com/india/army-begins-process-to-procure-fast-patrol-boats-landing-craft-and-surveillance-systems-2730314>



Wed, 18 Oct 2023

GE Engine Deal to Help Overcome Striking Tech Gap, Says HAL Chief

The joint production of GE Aerospace's F414 engines in India will help the country overcome a striking technology gap, lay the foundation for indigenous development of bigger jet engines, and possibly open doors to exports, HAL chief CB Ananthkrishnan said, adding that the American company and Hindustan Aeronautics Limited could hammer out a deal within a year.

“We have lacked the capabilities required to build jet engines,” he said in an interview. “The deal we are negotiating with GE will help fix the shortcomings. It will bring advanced technologies into the country and form the basis of future engine programmes to meet the Indian Air Force’s growing needs.”

GE and HAL signed a memorandum of understanding in Washington in June to produce 99 F414 engines for India’s light combat aircraft (LCA) Mk-2 programme during PM Narendra Modi’s visit. The deal will involve 80% transfer of technology (ToT) and is estimated to be worth around \$1 billion.

This “never-seen-before” scale of technology transfer will be a “big game-changer”, and result in the Mk-2 fighter jets having a significantly improved indigenous content compared to the two current LCA variants, Mk-1 and Mk-1A, Ananthakrishnan said. “Still, we will drive a hard bargain to conclude the most competitive deal. The figure of \$1 billion has been indicated by them (GE) and our effort will be to bring it down.”

HAL’s current experience with engines includes manufacturing the AL-31FP engines for Sukhoi-30s under licence from Russia, and the Shakti engines that power the advanced light helicopter and the light combat helicopter that have been co-developed with French engine maker Safran, the HAL chief said. HAL is also carrying out repair and overhaul of other aircraft engines.

“We are manufacturing the AL-31FP and Shakti engines under technology transfer which is not as exhaustive as what we will get under the F414 deal. But the experience thus far has been good and there have been valuable learnings that will help execute the new programme,” Ananthakrishnan said. The first lot of F414 engines will be made in India three years after GE and HAL conclude the deal.

The ToT for F414s will cover 11 critical areas many of which were entirely off-limits more than a decade ago when the US and India began talks on the possible production of the engines in the country, HAL officials said. Back then, the US agreed to only 58% technology transfer, keeping a string of key engine technologies out of India’s reach.

The F414 has evolved from the F404 engine that powers the existing Mk-1 and Mk-1A variants and is imported from the US. The local production of the F414 engines will result in the Mk-2 jets having an indigenous content of 75% compared to 55%-60% in Mk-1A and 50% in Mk-1.

HAL will set up a new engine complex for producing the F414 engines as existing capacities are insufficient for the programme.

Ananthakrishnan said. “An exclusive engine complex to build bigger engines will be a significant capacity addition which will help meet the country’s future requirements.” He said with necessary approvals, GE and HAL could later use the facility for exporting engines without restricting the effort to Indian requirements.

India has sanctioned ₹10,000 crore for the Mk-2 programme. The new fighter will cater to the future requirements of IAF, which has already inducted several of the 40 earlier Mk-1s, ordered 83 newer Mk-1As and plans to order 97 more Mk-1As. The IAF could order more than 100 Mk-2s.

The Mk-2 will be ready for production in five years, the officials said.

It will have improved range, higher weapons payload capacity, superior radar capability, better avionics, advanced electronics, enhanced survivability, better situational awareness for pilots, network centric capabilities, and the ability to quickly switch from one role to another.

The 17.5-tonne fighter will have a maximum speed of 1.8 Mach, compared to the 13.5-tonne LCA Mk-1A that has a top speed of 1.6 Mach. The new aircraft will come with a payload capacity of 6.5 tonne (compared to 3.5 tonne for the Mk-1A) and it will carry a mix of weapons including beyond

visual range air-to-air missiles, air-to-ground missiles, heavy precision guided weapons and conventional bombs.

The engine technologies that will now be transferred to India under the GE-HAL deal include machining and coating for single crystal turbine blades, fabrication of powder metallurgy discs, inertia friction welding for fan and afterburner, laser drilling technology for combustor, special coatings for corrosion and erosion, machining and coating of ceramic matrix composites for nozzle guide vanes, flaps and other parts, machining of thin-walled titanium casing, polymer matrix composites for bypass duct and bottle boring of shafts.

<https://www.hindustantimes.com/india-news/ge-engine-deal-to-help-overcome-striking-tech-gap-says-hal-chief-101697568895703.html>



Wed, 18 Oct 2023

Summit with Arab Leaders Called off as President Biden Heads to Israel

President Joe Biden's efforts to tamp down tensions in the escalating war between Israel and Hamas faced massive setbacks even before he departed for the Middle East on Tuesday, as Jordan called off the president's planned summit with Arab leaders after a deadly explosion at a Gaza hospital killed hundreds.

Mr. Biden now will visit only Israel and will postpone his travel to Jordan, a White House official said as he departed.

The postponement of the Amman summit comes after Palestinian leader Mahmoud Abbas withdrew from the scheduled meetings in protest of the attacks, which the Hamas-run Health Ministry in Gaza blamed on an Israeli airstrike. The Israeli military said it had no involvement and pinned the blame on a misfired Palestinian rocket.

"This war and this aggression are pushing the region to the brink," Ayman Safadi, Jordan's foreign minister, told al-Mamlaka TV, a state-run network. He said Jordan would only host the summit when all participants agreed on its purpose, which would be to "stop the war, respect the humanity of the Palestinians, and deliver the aid they deserve."

While in the air, Mr. Biden released a statement saying he was "outraged and deeply saddened by the explosion at the Al Ahli Arab hospital in Gaza, and the terrible loss of life that resulted."

He said he spoke "immediately" after hearing the news with King Abdullah II of Jordan and Israeli Prime Minister Netanyahu and said he has "directed my national security team to continue gathering information about what exactly happened."

"The United States stands unequivocally for the protection of civilian life during conflict and we mourn the patients, medical staff and other innocents killed or wounded in this tragedy," Mr. Biden added.

Still, the cancellation of the Jordan leg of the trip reflects an increasingly volatile situation that will test the limits of American influence in the region as Mr. Biden visits Wednesday.

The high-stakes presidential trip is emblematic of Biden's belief that the United States should not turn back from its central role on the global stage and his faith that personal diplomacy can play a decisive role.

“This is how Joe Biden believes politics works and history is made,” said Jon Alterman, a senior vice president at the Center for Strategic and International Studies who worked on the Senate Foreign Relations Committee while Biden was a member.

There's been no water, fuel or food delivered to Gaza since the October 7 attack by Hamas that killed more than 1,400 Israelis and triggered the unfolding war. Mediators have been struggling to break a deadlock over providing supplies to desperate civilians, aid groups and hospitals.

As the humanitarian crisis grows, so too does the concern of a spiraling conflict that stretches beyond the borders of Gaza. There have already been skirmishes on Israel's northern border with Hezbollah, an Iran-backed group that's based in Southern Lebanon.

“There's a lot that can go wrong on this trip,” Mr. Alterman said.

U.S. Secretary of State Antony Blinken, bouncing back and forth between Arab and Israeli leadership ahead of Biden's visit, spent seven and a half hours meeting Monday in Tel Aviv in an effort to broker some kind of aid agreement and emerged with a green light to create a plan on how aid can enter Gaza and be distributed to civilians.

It was on the surface a modest accomplishment, but U.S. officials stressed that it represented a significant change in Israel's position going in — that Gaza would remain cut off from fuel, electricity, water and other essential supplies.

Mr. Biden has a long track record of showing public support for Israel while expressing concerns privately to the Israelis about their behavior.

“He believes the only way to get inside the Israelis' heads is to demonstrate profound empathy, but also to be there,” Mr. Alterman said.

The Israel-Palestinian conflict has been ongoing for decades, and to a large extent, it's involved the same cadre of men. Mr. Netanyahu is the longest-serving prime minister in Israeli history. Mr. Abbas has been Palestinian president for nearly 20 years. Abdullah II has been king since 1999 — Mr. Biden has called the Jordanian king a loyal ally in a “tough neighborhood.” El-Sissi is the newest leader, president since 2014.

It's important for these leaders, too, to avoid a prolonged and engulfing regional escalation, particularly as Egypt and Jordan face growing economic tumult.

In September, the International Monetary Fund issued a report saying that Egypt and Jordan are among the countries in the region that “stand at the brink of a debt crisis.” Egypt in particular is struggling with high inflation.

Neither nation wants to absorb refugees. Jordan already has a large Palestinian population, and the country is coping with hundreds of thousands of refugees from neighboring Syria, Iraq and elsewhere.

With tens of thousands of troops massed along the Israel-Gaza border, Israel has been expected to launch a ground invasion — but plans remain uncertain. U.S. officials have refused to say whether the Israelis were holding off in order for Mr. Biden to visit.

“We are preparing for the next stages of war,” Israeli military spokesman Lt. Col. Richard Hecht said. “We haven't said what they will be. Everybody's talking about a ground offensive. It might be something different.”

Meanwhile, the death toll is mounting even without the war's next stage. Israeli strikes on Gaza have killed at least 2,700 people and wounded more than 9,700, according to the Gaza Health Ministry. Nearly two-thirds of those killed were children, a ministry official said.

Another 1,200 people across Gaza are believed to be buried under the rubble, alive or dead. More than 1 million Palestinians have fled their homes — roughly half of Gaza’s population — and 60% are now in the approximately 8-mile-long (14-kilometer-long) area south of the evacuation zone, according to the United Nations.

<https://www.thehindu.com/news/international/summit-with-arab-leaders-called-off-as-president-biden-heads-to-israel/article67432841.ece>



Tue, 17 Oct 2023

Boeing Flies AH-64E Apache v6.5 for First Time

Boeing has flown the latest version of the AH-64E Apache attack helicopter, Version 6.5, the company announced on 11 October. The flight took place at Boeing's Mesa, Arizona, factory.

“Subsequent to the first test flight, we'll be looking at software baseline verification testing,” Christina Upah, Boeing's vice-president of attack helicopter programmes, told Janes on 9 October ahead of the flight. “Essentially, we're taking the Version 6 software baseline, which was our common configuration, and adding additional capabilities to that software build. That opens up the aperture for open-systems interface, as well as enhanced sensors [and] enhanced mission systems.”

Improved systems on the v6.5 include upgraded Link 16 data sharing for manned-unmanned teaming, the integration of an interface to enable modular open systems architecture (MOSA), improvements to the crew's situational awareness, and a strengthened drivetrain and other equipment to replace the current General Electric T700 engines with General Electric T901 Improved Turbine Engine Program (ITEP) engines.

The US Army contracted Boeing to implement the upgrades in December 2021, but has not yet decided when they will be ‘cut in’ to ongoing AH-64E production to replace the current v6 standard.

<https://www.janes.com/defence-news/news-detail/boeing-flies-ah-64e-apache-v65-for-first-time>

THE TIMES OF INDIA

Wed, 18 Oct 2023

President Vladimir Putin Praises 'Dear Friend' Chinese President Xi Jinping, Pitches Russia's Northern Sea Route

President Vladimir Putin on Wednesday praised Chinese President Xi Jinping for the Belt and Road Initiative (BRI) and invited global investment in the Northern Sea route which he said could deepen trade between east and west.

Speaking on his second known trip outside the former Soviet Union since the Ukraine war, Putin thanked the Chinese leader for his invitation and said Russia could play a key role in China's modern day revival of the ancient Silk Road.

Putin called Xi his "dear friend" and heaped praise on the Belt and Road Initiative for bringing the world together. Shortly before Putin starting speaking, a handful of European delegates, including former French Prime Minister Jean-Pierre Raffarin, walked out of the room, a Reuters witness said.

"Russia and China, like most countries of the world, share the desire for equal, mutually beneficial cooperation in order to achieve universal sustainable and long-term economic progress and social well-being, while respecting the diversity of civilization and the right of each State to its own development model," Putin said.

Putin said the BRI fitted with Russia which he said was developing a host of transport infrastructure to criss-cross the world's biggest country, notably from the Northern Sea Route which runs from Murmansk near Russia's border with Norway eastwards to the Bering Strait near Alaska

"As for the Northern Sea Route, Russia does not just offer its partners to actively use its transit potential, I will say more: we invite interested states to participate directly in its development, and we are ready to provide reliable ice breaker navigation, communication and supply," Putin said.

"Starting next year, navigation for ice-class cargo ships along the entire length of the Northern Sea Route will become year-round."

Putin, who has attended previous BRI summits, brought a senior delegation from Moscow.

Among the senior Russian officials were Foreign Minister Sergei Lavrov, who is due to visit North Korea shortly, Deputy Prime Minister Alexander Novak, his top oil and gas point man, and Deputy Prime Minister Dmitry Chernyshenko.

Also included were Kremlin spokesman Dmitry Peskov, Kremlin economic aide Maxim Oreshkin, Kremlin foreign policy aide Yuri Ushakov, Economy Minister Maxim Reshetnikov and Igor Morgulov, Russia's ambassador to China.

<https://timesofindia.indiatimes.com/world/rest-of-world/president-vladimir-putin-praises-dear-friend-chinese-president-xi-jinping-pitches-russias-northern-sea-route/articleshow/104513366.cms>



Wed, 18 Oct 2023

South Korea Touts ‘Giant Leap Forward’ in Defence as Analysts Say Wars Boost Bid to Grow Arms Exports

South Korea on Tuesday opened one of Asia’s largest arms fairs to showcase its defence industry’s rags-to-riches story, as analysts say the Israel-Gaza conflict and Russia-Ukraine war could be a boon for Seoul’s goal to become the fourth-biggest weapons exporter.

At the opening ceremony of the biennial Seoul International Aerospace and Defense Exhibition, known as ADEX, President Yoon Suk-yeol said the defence industry of South Korea, which once relied on aid and arms imports, was entering “a new chapter”.

Speaking at the Seoul Air Base in the city’s southern suburbs, Yoon noted that the weapons on display at the fair included the home-grown 4.5-generation supersonic KF-21 fighter jet, surface-to-air missiles, K-9 howitzers and K-2 tanks, combat helicopters, infantry fighting vehicles and a precision-targeting rocket artillery system known as Chunmoo.

“Our defence cooperation [with other countries] is now beyond simply exporting weapons,” Yoon said, adding the cooperation had expanded to encompass supplying equipment and parts, training and research. “We plan to establish a defence-security cooperation system with friendly countries by sharing our experience growing our defence industry.”

This year’s show is designed to help South Korea reach its goal of becoming the world’s fourth-largest arms exporter, Lee Jong-ho, chief of the fair’s organising office, told a briefing on Monday. More than 450 senior defence officials from 54 countries were expected to attend, along with hundreds of thousands of other professionals and members of the public, he said.

“This is an opportunity for Korea’s defence industry to draw international attention and take a giant leap forward,” Lee said. Seoul has set a goal of reaching US\$20 billion in defence exports this year, after sealing a record US\$17.3 billion in arms sales last year, including huge deals with Poland for tanks, howitzers, warplanes and rockets.

In recent years, South Korea has placed roughly ninth in the world for defence exports, but Yoon has called for it to improve.

To commemorate the 70th anniversary of South Korea’s alliance with the United States, the show features a larger-than-usual display of American military power, including the B-52 bomber, US Air Force Colonel Charles Cameron said.

Under Yoon, South Korea and the US have stepped up displays of strength, particularly in terms of US nuclear-capable assets, in an effort to deter North Korea.

The KF-21 fighter jet made its public debut on Monday with a demonstration flight. It’s set to be joined by US military aircraft, including the F-22 stealth jet, F-16 fighter jet, T-50 trainer jet and U-2 spy plane.

During the exhibition, which lasts until Sunday, two flyovers are also planned by the US Air Force’s nuclear-capable B-52 bombers.

Although B-52s – considered a key strategic asset alongside the B-1B and B-2 bombers – have been deployed to Seoul and Washington’s joint drills, this will mark the first time that one has landed at a South Korean airbase, Yonhap news agency reported.

In a further sign of growing trilateral security cooperation, South Korea, the US and Japan have completed work on a three-way communication hotline, Yonhap reported on Tuesday, citing a senior Seoul official.

The hotline comes at a time of military tensions with North Korea and China’s growing regional influence. The three countries’ leaders announced a commitment to consult each other in times of crisis at a summit at Camp David in August. The hotline is to be used by the leaders or their top national security advisers in times of security crises, and technical tests of the system have been completed, Yonhap said, citing the anonymous source.

Yang Uk, a senior researcher at the Asan Institute for Policy Studies, said ADEX provided a rare opportunity for potential buyers to inspect popular South Korea-produced weapons in one place at one time.

“The fresh conflict between Israel and Palestine and the ongoing war between Russia and Ukraine are raising security concerns in many countries and this could be a boon for South Korea’s defence industry,” said Yang, an expert on military strategy and weapons systems.

Because of persistent threats from nuclear-armed North Korea, South Korea has been compelled to ratchet up efforts to develop cutting-edge conventional weapons, resulting in an enhanced competitiveness in global weapons markets, he said.

Its half-million-strong standing army provided a sizeable market and the need to train with new weapons also meant rare opportunities to test them, Yang added.

But Yang said there were downside risks in the growing resentment among EU states about importing weapons from outside the bloc and the US being piqued by South Korea expanding its weapons-market share.

Lee Il-woo, a senior researcher at the Korea Defence Network think tank, said Sunday's change of government in Poland – which had emerged as Seoul's largest client – cast a dark cloud over South Korea's weapons exports to the European nation.

“The country's weapons exports may suffer due to political situations in importing countries,” Lee said, noting that share prices of arms exports including Hanwha, LIG and Rotem plunged more than 3 per cent on Monday following the Polish election.

<https://www.scmp.com/week-asia/economics/article/3238296/south-korea-touts-giant-leap-forward-defence-analysts-say-wars-boost-bid-grow-arms-exports>

Science & Technology News



Tue, 17 Oct 2023

Space Station by 2035, Manned Mission by 2040: PM Modi Tells ISRO to Aim High

A space station by 2035, and a manned mission to the Moon by 2040 -- these were the objectives listed by Prime Minister Narendra Modi for the Indian Space Research Organisation (Isro) on Tuesday during a review of India's first manned space mission, a crucial test flight for which is scheduled on October 21.

“Building on the success of the Indian space initiatives, including the recent Chandrayan-3 and Aditya-L1 missions, Prime Minister directed that India should now aim for new and ambitious goals, including setting up ‘Bharatiya Antariksha Station’ (Indian Space Station) by 2035 and sending first Indian to the Moon by 2040,” an official statement from the Prime Minister's Office (PMO) said.

The department of space, which oversees the operations of Isro, has also been directed to develop a roadmap for India's future Moon missions, the development of a Next Generation Launch Vehicle (NGLV), which would be equipped to undertake return missions, the construction of a new launch pad, and the setting up human-centric laboratories and associated technologies.

In the meeting, PM also called upon Indian scientists to work towards interplanetary missions including a Venus orbiter mission and a Mars lander.

“The department of space presented a comprehensive overview of the Gaganyaan Mission, including various technologies developed so far such as human-rated launch vehicles and system qualification. It was noted that around 20 major tests, including three uncrewed missions of the Human Rated Launch Vehicle (HLVM3) are planned,” the statement added.

In the review meeting, the date for Isro's test vehicle development flight (TV-D1), a crucial test for India's first human spaceflight Gaganyaan, on October 21, was also reiterated. Isro announced in a separate statement on Tuesday that the test flight is scheduled to take-off at 8am on October 21 from the Satish Dhawan Space Centre in Sriharikota.

"...It will be a short duration mission and the visibility from the launch view gallery will be limited," the Isro statement read.

The Gaganyaan project is a demonstration of India's ability to send manned space missions and involves the launch of a crew of three an orbit of 400km for a three-day mission.

"The prerequisites for Gaganyaan mission include development of many critical technologies including human rated launch vehicle for carrying crew safely to space, life support system to provide an earth like environment to crew in space, crew emergency escape provision and evolving crew management aspects for training, recovery and rehabilitation of crew," Isro said in its mission document.

The space agency said that the mission also plans to demonstrate its technology preparedness levels before carrying out the final human space flight mission. These demonstrator missions include integrated air drop test (IADT), pad abort test (PAT) and test vehicle (TV) flights.

The TV-D1 test vehicle is a single-stage liquid rocket developed for this abort mission. The payloads consist of the Crew Module (CM) and Crew Escape Systems (CES) with their fast-acting solid motors, along with CM fairing (CMF) and Interface Adapters.

"This flight will simulate the abort condition during the ascent trajectory corresponding to a Mach number of 1.2 encountered in the Gaganyaan mission. CES with CM will be separated from the test vehicle at an altitude of about 17 km. Subsequently, the abort sequence will be executed autonomously commencing with the separation of CES and deployment of the series of parachutes, finally culminating in the safe touchdown of CM in the sea, about 10 km from the coast of Sriharikota," the space agency said.

<https://www.hindustantimes.com/india-news/space-station-by-2035-manned-mission-by-2040-pm-modi-tells-isro-to-aim-high-101697555028513.html>



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ISRO has a Number of Milestones Planned before First Crewed Flight of Gaganyaan Programme

One question that ISRO personnel are asked all the time is when India will send humans into space. ISRO is working towards the goal with the ambitious Gaganyaan programme, which will not only allow the space agency to develop the capabilities of ferrying humans to Earth orbit, but will do so on hardware that is locally designed and produced in India. ISRO has an extremely reliable rocket fleet, and the reason that the performance on the flights are normal, is because of extensive on-ground testing and developmental flights ahead of the mission.

The brand new hardware that ISRO is developing for the Gaganyaan programme has already undergone an extensive battery of testing. A higher thrust was necessary from the LVM3 launch vehicle, with the rocket engines modified accordingly and tested. All the stages of the rocket have

been extensively tested on the ground to ensure their performance for a human-rated mission. With Indian astronauts on board the rocket, ensuring the safety of the crew is absolutely critical.

In case the rocket veers off course or in the event of a flight that is not nominal, then ISRO needs to eject the crew module (CM) containing the humans, and recover them safely. To jettison the CM, ISRO uses specialised crew escape system (CES) motors. As the rocket engines perform differently at various altitudes because of atmospheric conditions, there is a low-altitude escape motor (LEM) as well as a high-altitude escape motor (HEM), along with a CES jettisoning motor (CJM). ISRO has already completed testing all of these components.

ISRO has procured a number of mockup crew modules from private industries for the testing campaign

ISRO has procured a number of simulated crew modules, which are mockups with the same dimensions, weight and attachments as the CM that ISRO is expected to use on the first crewed flight. These are unpressurised crew modules, while the CM used in the final flight will be pressurised, that is isolated from the environment with a life support system carefully regulating the air inside the CM. The on-board propulsion system of the CM, to change its orientation, as well as the sequence of parachutes necessary to allow the CM to safely descend, have also been tested.

The tests in preparation for the eventual Gaganyaan mission have been proceeding for over a decade now. The most well-known of the early tests towards the programme was the Crew module Atmospheric Re-entry Experiment (CARE) mission conducted in December 2014, which was followed by a pad abort test in 2018. The hot tests for the propulsion system on the CM was conducted in August 2021. Qualification tests for the human-rated cryogenic engine were completed in January 2022. A parachute air-drop test was conducted in November 2022.

The testing campaign in 2023 got more intensive, with the parachutes tested on a sled on rails, powered by rockets, in March. The thrusters on the CM were tested in April 2023, with the test campaign for the human-rated Vikas engines also completed in the same month. The on-board propulsion system of the CM was qualified in May 2023. In August 2023, there was a rocket sled test of the drogue parachute system, which pulls out the primary parachutes. In September 2023, hot tests were conducted for the upgraded CE20 engine.

During all this time, ISRO has also been training astronaut designates drawn from the Indian Air Force (IAF) using new facilities set up in Bengaluru specifically for that purpose. The training programme has a syllabus designed by ISRO, DRDO and IAF, guided by Wg Cdr (Retd) Rakesh Sharma and Air Cmde (Retd) Ravish Malhotra, both of whom received training from the Soviet Intercosmos programme. ISRO has also started trials for the recovery operations, to bring back the CM to the ground after an ocean splashdown, which is being led by the Indian Navy.

ISRO is committed to testing the brand new hardware before the first crewed Gaganyaan flight

Now ISRO is ready to begin a series of uncrewed flights for the Gaganyaan programme. The first of these is scheduled to take place on October 21, using a specially modified single-stage rocket. The flight will be used to simulate a failure condition during the launch, and ensure that the CM can eject and safely return the astronauts on board to the Earth, with an ocean splashdown. During the Flight Test Vehicle Abort Mission-1 (TV-D1), the simulated abort will take place at an altitude of 17 kilometres, at Mach 1.2, during a flight that will match the trajectory of the planned Gaganyaan flights.

After the TV-D1 mission, ISRO will conduct three additional demonstration flights, numbered D2 through D4, to qualify various systems and subsystems on the brand new hardware, ahead of the first crewed flight. While other space agencies used dogs, monkeys and chimpanzees to evaluate

the impact of spaceflight on humans, ISRO is opting for the much more humane approach of using a gynoid loaded with sensors, known as Vyommitra. A mockup crew module will also be used on an air drop test, where it will be dropped from an IAF helicopter.

The remaining milestones for the Gaganyaan programme before the first crewed flight are a series of integrated air drop tests, the four demonstration flights for the test vehicle, the pad abort tests, and a series of uncrewed flights, where the entire sequence from launch, to orbital insertion, to ocean splashdown, and recovery will be rehearsed. It is only after ISRO can absolutely ensure the safety of the personnel on board, will the first crewed Gaganyaan flight take place.

<https://www.news9live.com/science/isro-has-a-number-of-milestones-planned-before-first-crewed-flight-of-gaganyaan-programme-2322449>

