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DRDO News

DRDO Technology News



Press Information Bureau
Government of India

Ministry of Defence

Mon, 02 Jan 2023

DRDO Celebrates its 65th Foundation Day; Floral Tributes Paid to Former President Dr APJ Abdul Kalam at DRDO Headquarters in New Delhi

Floral tributes were today paid at the bust of former President Dr APJ Abdul Kalam at DRDO Headquarters in New Delhi to mark the 65th Foundation Day of the Organisation, which is celebrated on 1st January every year. Secretary, Department of Defence R&D and Chairman, DRDO Dr Samir V Kamat along with Director Generals and senior officials of DRDO paid floral tributes at the bust of Missile Man of India.

The event, organised to mark the day, also included release of two books comprising articles on defence technologies, a dictionary on scientific and technical terminology, Stores Manual and guidelines (SMG-2023), third anniversary issue of bimonthly bulletin InSight and DRDO Technology Foresight. DRDO Technology Foresight will be shared on DRDO website so that industry and academia may plan their R&D activities accordingly.

A DRDO monograph 'Infrared Signatures, Sensors and Technologies' authored by Dr Kamal Nain Chopra, a former DRDO Scientist, was also released by the Chairman DRDO. DRDO calendar 2023 was also released. In addition, Secretary DD R&D and Chairman DRDO felicitated all the employees who have completed 25 years of their service in DRDO.

In his address to the DRDO fraternity on the occasion, Dr Samir V Kamat congratulated them for achieving a number of milestones in 2022, urging them to focus on developing the defence R&D ecosystem in the country and strive to realise Prime Minister Shri Narendra Modi's vision of 'Aatmanirbhar Bharat'.

The DRDO Chairman stated that several systems developed by DRDO have been delivered, inducted or handed over to the users. These include three firing units of Medium Range Surface to Air Missile for IAF, Shakti EW system, InfraRed Signature Suppression System for ships, Brake Parachutes for Su-30 fighter aircrafts, Commanders Thermal Imaging Sight with Laser Range Finders for T-90 Tank, Dhvani Automated Sonar Trainer, four types of Radiation Contamination Monitoring Systems, MIG-29 Aircrew Helmet and Pressure Breathing Oxygen Masks etc. Dr Kamat added that the Acceptance of Necessity (AON) has also been accorded by

the Defence Procurement Boards and Defence Acquisitions Council for induction of several DRDO developed systems. Some of the notable systems include: Sarang ESM system, Light Tank, Tactical Advance Range Augmentation (TARA) kit, Long Range Guided Bomb (LRGB)-Gaurav, Naval Anti-Ship Missile-Medium Range (NASM-MR), Air surveillance radar for NGMV, Low Level Transportable Radar (LLTR) -Ashwini, New Generation Anti-radiation Missile (NGARM), Pralay, Guided Extended Range Rocket Ammunition for Pinaka, Self-Propelled Mine Burier, Infantry Combat Vehicle-Command, Anti-Personnel Fragmentation Mine 'Ulk', Infantry Floating Foot Bridge, Bridge Laying Tank (BLT) T-72 and ACADA.

The DRDO Chairman added that Authority Holding Sealed Particulars (AHSP) of Army version of Akash Weapon System have been handed over to Missile Systems Quality Assurance Agency. Several major systems have either been completed or are in the final stages of user evaluation. These include Advanced Towed Artillery Gun System (ATAGS), Third Generation Helicopter Launch Anti-Tank Guided Missile 'Helina', NAMIS (Tracked) and 'Nag' Anti-Tank Guided Missile, Quick Reaction Surface to Air Missile, Medium Range Surface to Air Missile, Mechanical Mine Layer (self-propelled), 84 mm Anti-Thermal/Anti-Laser Smoke Grenade, HEPF and RHE (Enhanced) Rocket Ammunition for Pinaka MRLS, 125 mm FSAPDS, Air Defence Fire Control Radar 'Atulya', Weapon Locating Radar for Mountains, V/UHF Manpack Software Defined Radio, P-16 Heavy Drop System, Portable Diver Detection Sonar System, Advanced Light Weight Torpedo, and Sea Water Purification Kit for Gaganyan Mission.

Dr Kamat stated that several systems are also undergoing developmental trials. These include Electronic Warfare Systems for Naval platforms under the programme Samudrika, Phase-II Ballistic Missile Defence Interceptor AD-1 Missile, extended range version of BrahMos from Su-30 aircraft, Very Short Range Air Defence System, Naval Anti-Ship Missile-Short Range, Agni Prime, Vertical Launch-Short Range Surface to Air Missile (VL-SRSAM), Akash-New Generation, Man-Portable Anti-Tank Guided Missile (MPATGM), Enhanced Range Pinaka Rocket System, High speed expendable Aerial Target 'Abhyas', Small Turbo Fan Engine, Kaveri Dry Engine WhAP-CBRN, Shatrughat and EW Systems for Plains and Desert Active Electronically Scanned Array Radar 'Uttam', Advanced Light Towed Array Sonar among others.

The DRDO Chairman said that it is expected that most of the systems under trials will be handed over to the users in the coming year. He summarised that five CCS programmes worth Rs 26,000 crore and 55 other projects worth Rs 11,000 crore were sanctioned in 2022. 32 previously sanctioned projects were successfully completed. Some other flagship programmes such as Advanced Medium Combat Aircraft (AMCA) are also under consideration for approval by CCS.

Dr Kamat brought out that in the past year, DRDO has signed 145 ToTs. Towards IP protection, 160 patents were filed and 100 have been granted during 2022. The fund limit under Technology Development Fund (TDF) Scheme was enhanced to Rs 50 crore from Rs 10 crore per project. This will enable DRDO to support industry for development of more complex technologies. He mentioned that MoU was also signed between Naval Innovation and Indigenisation Organisation and TDF to work jointly on advanced naval technologies. In addition, he mentioned that the 4th version of Dare to Dream contest has been launched by the Raksha Mantri. He informed that DRDO has now established a total of 15 DRDO-Industry-Academia Centres of Excellence (DIA-CoEs). Currently, 867 projects are on-going with academia at a cost of Rs 1,183 crore.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1888133>

IIT Madras Centre of Excellence, DRDO Working Together on Advanced Defence Technologies for National Defence

Indian Institute of Technology, IIT Madras Centre of Excellence and Defence Research and Development Organisation, DRDO are working together to develop Advanced Defence Technologies. IIT Madras CoE- 'DRDO Industry Academia- Ramanujan Centre of Excellence' (DIA-RCoE) will be conducting a directed research process to meet the national defence and security needs of the nation.

DIA-RCoE was initially established by DRDO and then IIT Madras took it over. IIT M converted it into a 'Centre of Excellence,' an interdisciplinary research group that brings in faculty and researchers from multiple departments to undertake translational research.

DIA-RCoE has been established to conduct directed research in advanced technologies for defence and security and to create a world-class research centre developing cutting-edge technologies. This initiative will be a contribution towards 'Aatmanirbhar Bharat' in the defence sector, stated IIT Madras.

The research will be conducted in the following areas:

- Electronics and Computational Systems,
- Naval Systems and Naval Technologies
- Advanced Combat Vehicle Technologies
- High Power CW Laser sources
- Next-generation communication and networking technologies

Highlighting the outcomes envisaged from DRDO Industry Academia- Ramanujan CoE, Prof. V. Kamakoti, Director, IIT Madras, said, "It is an important milestone in bringing together the Academia, Industry and DRDO to collaborate and develop Atmanirbhar technologies for critical needs of our country. Specifically, this will provide a first-of-its-kind opportunity for Start-ups and MSMEs to participate in this critical Nation Building activity."

The newly appointed Director of DIA-RCoE, Dr. O.R. Nandagopan said, DRDO is attaching high priority for the development of futuristic technologies and systems for defence through academia and industry. This centre will identify the strength of faculty members and industry partners and develop cutting edge technologies and systems for our armed forces"

<https://www.timesnownews.com/education/iit-madras-centre-of-excellence-drdo-working-together-on-advanced-defence-technologies-for-national-defence-article-96696978>

DRDO on Twitter





DRDO 
@DRDO_India





Chairman DRDO also released a monograph on Infrared Signatures, Sensors & Technologies, bi-monthly bulletin-InSights, DRDO Technology Foresight, Stores Manual guidelines 2023 and a book comprising of articles on defence technologies (25 in english & 25 in hindi)



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7:16 PM · Jan 2, 2023

Business Standard

Tue, 03 Jan 2023

Rajnath Singh to Inaugurate Infra Projects in Arunachal Pradesh Today

Defence Minister Rajnath Singh will visit Arunachal Pradesh today to inaugurate a series of development projects. The visit comes a month after Indian and China troops clashed along the Line of Actual Control (LAC) in the Tawang sector. Singh will inaugurate the Siyom Bridge near Boleng in Siang district and also virtually inaugurate 27 projects of the Border Roads Organisation (BRO).

The 100-metre-long Siyom bridge over river Siyom is a strategically important bridge as it gives the military a strategic advantage in deploying troops to the far-flung areas of the Line of Actual Control. In a statement in Parliament, the Defence Minister said that the Indian Army bravely stopped the Chinese People's Liberation Army (PLA) troops from encroaching on Indian territory, and forced them to withdraw to their posts. "On December 9, 2022, PLA troops tried to transgress the LAC in the Yangtse area of Tawang sector and unilaterally change the status quo. The Chinese attempt was contested by our troops in a firm and resolute manner. The ensuing face-off led to a physical scuffle in which the Indian Army bravely prevented the PLA from transgressing into our territory and compelled them to return to their posts," Defence Minister Rajnath Singh said in the Lok Sabha.

The Minister said that the issue had been taken up with China through diplomatic channels. "After this incident, on December 11, the local commander of the area held a flag meeting with his Chinese counterpart under the established system and discussed this incident. The Chinese side was refused all such actions and told to maintain peace at the border," Singh told the Lok Sabha.

The Defence Minister said that no Indian troops were killed or seriously injured in the incident.

He said, "In this face-off, a few soldiers on both sides suffered injuries. I'd like to tell this House that none of our soldiers died or suffered any serious injury. Due to the timely intervention of Indian military commanders, PLA soldiers have retreated to their own locations."

"This matter has also been taken up with China through diplomatic channels. I want to assure the House that our forces are committed to guarding our borders and ready to thwart any attempt that will be made to challenge it," Rajnath Singh said.

"I am confident this House will respect the capability, valour and commitment of our armed forces, Singh added.

https://www.business-standard.com/article/current-affairs/rajnath-singh-to-inaugurate-infra-projects-in-arunachal-pradesh-today-123010300101_1.html

THE HINDU BusinessLine

Mon, 02 Jan 2023

Army Troops to Showcase Indigenous Equipment During India-Japan Exercise

To capitalise on Tokyo's recent decision to hike military investment owing to threat from China, India's Ministry of Defence (MoD) will showcase indigenously-manufactured equipment at a fortnight-long bilateral military exercise planned in Japan from February 13.

The Army has reached out to the manufacturers. "A bilateral military exercise is planned at Japan from February 13 to March 2. To promote Indian defence industry, it is proposed that indigenous equipment be carried by the participating Army contingent and showcased at Japan," said a communication from the Army.

Members interested in participating will have to hand over the equipment to the Army at Alwar by February 5 and subsequently collect it on return, read the communication. Before that, domestic defence companies have to give a written expression of interest, mailed to the MoD as well as to Society of Indian Defence Manufacturers (SIDM), the not-for-profit apex body of the Indian defence industry, before January 10.

Some of the equipments sought by the Army are: Drones, man-portable counter drone system, counter improvised-explosive-devise equipment, robot for room intervention operations, latest small arms like rifles, body armour, communication equipment and medical equipment including for casualty-evacuation and management, said the letter.

On August 30, businessline had reported that India and Japan have projects in areas of drones, anti-drone systems, robotics, underwater communication, Li-ion battery technology and intelligence systems to further boost defence co-operation. Some of the industry level dialogue that may mature are - defence PSU Bharat Electronics Ltd (BEL) and M/s Toshiba Corporation of Japan are in discussion for Li-Ion battery technology. In the new national security strategy, Japan has on record listed India as the key partner besides Australia and United States of America as it gears for the biggest-ever defence build up to face aggressive China in the Indo Pacific Region. Japan has also decided to increase its defence budget by two per cent of the GDP.

<https://www.thehindubusinessline.com/news/army-troops-to-showcase-indigenous-equipment-during-india-japan-exercise/article66330683.ece>

Total of 519 Indian and Foreign Exhibitors Sign up for Aero India 2023

With about a month-and-a-half left for the Aero India 2023, a number of exhibitors, both Indian and foreign, have registered for the biennial air show. A total of 519 exhibitors have so far registered for the five-day air show to be held at Air Force Station Yelahanka between February 13 and 17. Of the 519 exhibitors, 486 are Indian exhibitors, while 33 are from 21 foreign countries.

According to the Ministry of Defence, the event will combine a major trade exhibition of the Aerospace and Defence industries as well as aerial display by IAF and others. With about a month-and-a-half left for the Aero India 2023, a number of exhibitors, both Indian and foreign, have registered for the biennial air show. A total of 519 exhibitors have so far registered for the five-day air show to be held at Air Force Station Yelahanka between February 13 and 17. Of the 519 exhibitors, 486 are Indian exhibitors, while 33 are from 21 foreign countries.

According to the Ministry of Defence, the event will combine a major trade exhibition of the Aerospace and Defence industries as well as aerial display by IAF and others.

“Besides global leaders and big investors in the Aerospace industry, the show will also see participation by think tanks from across the world. Aero India will provide a unique opportunity for exchange of information, ideas, and new developments in the aviation industry. In addition to giving a fillip to the domestic aviation industry, it would further the cause of Make in India,” the Ministry said recently.

The 2023 edition of Aero India will return to its old avatar. The air show which is traditionally held for over five days was reduced to a three-day event during the last edition in 2021 with the last two days (public viewing days) being cancelled due to the COVID-19 pandemic. Besides, the previous show was also unique as it was the world’s first hybrid exhibition wherein the business elements of the event were held in both physical as well as virtual modes. Delegates from over 55 countries and more than 540 exhibitors had participated in Aero India 2021.

The event also saw the signing of over 201 new business partnerships through MoUs, agreements and collaborations were inked and the show was attended by 16,000 delegates.

<https://www.thehindu.com/news/cities/bangalore/total-of-519-indian-and-foreign-exhibitors-sign-up-for-aero-india-2023/article66330211.ece>

India Building Permanent Bunkers for BSF at Gujarat Creek Along Pakistan Border

For the first time, India is constructing "permanent vertical bunkers" of concrete to station BSF troops right at the strategically significant Sir Creek and 'Harami Nalla' marshy area along the India-Pakistan International Border in Gujarat, official sources said. The Union Home Ministry has sanctioned a Rs 50-crore fund for the construction of eight multi-storeyed bunkers cum observation posts in this area along the Bhuj sector in view of the "constant infiltration of Pakistani fishermen and fishing boats in the area", the sources told PTI.

According to official data, the Border Security Force (BSF) apprehended 22 Pakistani fishermen and seized 79 fishing boats as well as heroin worth Rs 250 crore and charas worth Rs 2.49 crore from this region of Gujarat in 2022.

While three pylon-shaped towers are coming up in the Sir Creek area, a 4,050 sq km marshy area between India and Pakistan, five such concrete structures will be constructed by the Central Public Works Department (CPWD) along the 'harami nalla' area spread across 900 sq km, sources said.

The top floor of each of the 42-foot high 'vertical bunkers' will have space for mounting surveillance gadgets and radars to keep an eye on the area that comprises serpentine estuaries. The rest two floors will have the capacity to house around 15 armed BSF personnel and their logistics, the officials said.

According to officials, these bunkers are being erected in the Lakhpat Wari bet, Dafa bet and Samudra bet on the eastern side of the creek area, well within Indian territory.

A BSF contingent is providing armed protection to the labourers engaged by the CPWD to complete the construction of the three bunkers in the Sir Creek area by March. The ocean gets too turbulent from April and hence the work is going on at war footing, a senior BSF officer said.

The move to build the bunker came after then BSF director general (DG) Pankaj Kumar Singh, during a tour of Union Home Minister Amit Shah to the Gujarat border in April last year, along with senior officers made a presentation that the creek area and the marshy water body between India and Pakistan were prone to infiltration and the BSF security apparatus was located way behind.

The BSF said it requires eyes right at the front and for that to happen it needed a permanent base, a senior official privy to this meeting said. It was informed during the presentation that the area is "very sensitive and holds enormous strategic significance" and hence the BSF needs some permanent bases right on the front as compared to the border posts that are currently located about 50-60 km from the creek area. In order to "dominate" the creek areas, the BSF sends regular foot and boat patrols to keep vigil in the entire 85-km-long coastal region of Gujarat under its control, they said, adding that currently, it takes about five to six hours for troops to reach the border from their posts, onboard speed boats or regular boats. The creek area has very inhospitable weather and terrain. The marshes are home to poisonous snakes and scorpions. BSF

personnel have to move barefoot while undertaking patrols as one cannot walk with boots on in the swamp area, official sources said.

The three bunkers will be the first permanent structures in the area prone to tidal waves every four hours a day. Anything made of metal or any other item corrodes due to high salt content in the area, the officials said.

The BSF has been dominating this area for over six decades. Last year, Indian Air Force helicopters were pressed into service to help the BSF troops find some Pakistani fishermen who had intruded into the Indian side and were untraceable for some time.

Sir Creek is a 98-km disputed territory between India and Pakistan in the Rann of Kutch marshlands, which opens up into the Arabian Sea. It divides the Kutch region of Gujarat and the Sindh province of Pakistan. The two countries have been holding talks to resolve issues related to the border dispute here.

<https://economictimes.indiatimes.com/news/defence/india-building-permanent-bunkers-for-bsf-at-gujarat-creek-along-pakistan-border/articleshow/96685637.cms>



Mon, 02 Jan 2023

Chinese Incursions to Theatre Commands, What are Indian Military's Big Challenges in 2023?

By Pradip R. Sagar

Year 2022 was a mixed bag for the Indian military. While the Indian Army continues to tackle Chinese troops in the icy heights of the Himalayas, the navy got a major boost with INS Vikrant, the country's first indigenous aircraft carrier. It put India in the elite group of nations to have developed their own aircraft carriers. What does 2023 hold for India militarily given its two difficult neighbours, China and Pakistan?

After 17 rounds of military commander-level meetings between India and China, the situation on the Line of Actual Control (LAC) remains tense. Both sides have amassed a high number of men and weaponry along the border. The incursion attempt by the PLA (People's Liberation Army) in Tawang sector of Arunachal Pradesh in December has again shown how the Chinese military cannot be trusted. China has also refused to accept India's proposal for disengagement at Demchok and Depsang Bulge in Ladakh. India will have to keep a close eye on Chinese movements since latest satellite images show new Chinese forward posts in the area.

Meanwhile, the first batch of Agniveers has reached training academies. Over 5.4 million registrations were received by the three services for Agniveer recruitment into the Indian armed forces (army 3.7 million, navy 0.95 million and air force 0.76 million). In June 2022, the Union government had announced the Agnipath scheme for recruitment of youth into the military. As per the plan, after serving for four years, 75 per cent of the recruits would be retired with a financial package of Rs 12 lakh. Agniveers will be eligible for all gallantry honours as well as

perks like Siachen Allowance. If killed in action, an Agniveer's family would get a compensation of Rs 1 crore. The scheme received a lot of flak within the military fraternity over its truncated training schedule. If a regular trooper is trained in basics like weapons handling and fieldcraft for 44 weeks, Agniveers will receive only 26 weeks of training.

For the Indian Air Force (IAF), the priority going ahead is to replenish its depleting fighter squadrons in order to, as Air Chief Marshal V.R. Chaudhari recently said, "retain our combat edge". The statement came even as China was bolstering its airbases in Tibet with deployment of a large number of fighter jets and advanced drones.

The IAF is left with 31 squadrons against its approved strength of 42. Recently, the IAF received the last of its 36 Rafale fighter jets as part of a deal with France. But the overall number remains low as most of the IAF fighter jets are on way to completing their service period. In September, the Cabinet Committee on Security (CCS) had approved Rs 6,500 crore in additional funds to fast-track the development of an upgraded version of the LCA Mk2, which is supposed to replace 16 fighter jet squadrons—three squadrons of Mirage 2000, five of MiG-29, six of Jaguar and two of MiG-21 Bison.

The IAF is looking to bolster its fighter squadron strength to 40 by 2040. In 2018, it had floated a request for proposal worth \$20 billion to procure 114 foreign-made multirole fighter aircraft (MRFA)—about six squadrons. But the deal is yet to take off.

On the maritime front, while the navy has inducted its second aircraft carrier, INS Vikrant, its underwater capability poses a challenge for naval planners. Many military observers believe India's underwater capability is nowhere close to meeting the needs of its 7,516 km coastline. While China operates 65 submarines, the Indian Navy's fleet of attack submarines—all diesel-powered—has come down from 21 in the 1980s to just 15, besides a nuclear-powered submarine. Also, only eight submarines are battle-ready at any given time since half the fleet undergoes mid-life upgrades due to their age (most are three decades old).

The navy needs at least 24 submarines to meet its 30-year submarine-building plan, which was approved by the CCS in 1999 after the Kargil War. The plan was to induct 12 diesel-powered submarines by 2012 and another 12 by 2030. But repeated delays have forced the navy to rejig the plan. The revised plan is to have 18 diesel-powered submarines and six SSNs (nuclear-powered submarines). However, the navy has received five of six Scorpene-class submarines, built at the Mazagon Dock Shipbuilders Limited (MDL) in Mumbai in collaboration with the Naval Group of France, under Project-75. But the plan to acquire six additional lethal submarines is running way behind schedule. Navy planners believe that while China remains India's biggest threat, even the smaller navy of Pakistan is leaping ahead of the Indian Navy.

In line with its 'Vocal for Local' push to boost the domestic defence industry, the Union Budget earmarked 68 per cent of capital expense in the defence sector for the Atmanirbhar Bharat implementation programme for acquisition through Indian entities. The allocation for indigenous acquisition has been increased from 58 per cent to 68 per cent of the capital budget while 25 per cent was reserved for the private sector.

The allocation of 25 per cent of the defence R&D budget for start-ups, academia and private industry has been widely welcomed. In October, the ministry of defence released the fourth positive indigenisation list, including 101 additional items that have to be procured from domestic manufacturers. The positive indigenisation list essentially has items that the armed

forces will procure only from domestic manufacturers. These manufacturers could be from the private sector or DPSUs (defense public sector undertakings).

Despite multiple steps, India continues to heavily depend on imports for its military needs and is amongst the top five buyers of weapons in the world. Over the decades, the Indian military has been largely dependent on military platforms from Russia and Ukraine. With Russia and Ukraine in war, Indian domestic players have an opportunity make their place.

Finally, will the military's ambitious Theatre Commands plan, aimed at infusing jointness in the three services, become a reality? A theatre command would have specialised units from the army, navy and air force. Such commands will work under an officer from any of the three services, depending on the function assigned. Like in the US and China, the plan is to have five commands—northern, western, peninsular, air defence and maritime. But the road to this jointness has not been easy, with the IAF opposing the concept. The project suffered a setback with the demise of General Bipin Rawat, India's first chief of defence staff (CDS). The new CDS, General Anil Chauhan, now has the challenging task of getting the IAF on board.

<https://www.indiatoday.in/india-today-insight/story/chinese-incursions-to-theatre-commands-what-are-indian-militarys-big-challenges-in-2023-2316431-2023-01-02>

THE ECONOMIC TIMES

Mon, 02 Jan 2023

Japan Says it Scrambled Jets to Monitor Chinese Aircraft Carrier Operations

Japan said on Monday it scrambled jet fighters and dispatched aircraft and warships over the past two weeks to keep tabs on China's Liaoning aircraft carrier and five warships that conducted naval manoeuvres and flight operations in the Pacific.

Japan monitored the operations after the Chinese naval group, which included missile destroyers, sailed between the main Okinawa island and Miyakojima island into the Western Pacific from the East China Sea on Dec. 16, Japan's Ministry of Defence said in a press release.

Before returning the same way on Sunday, the Chinese carrier conducted more than 300 take-offs and landings of fixed-wing aircraft and helicopters, added the ministry, which did not report any incursions into Japanese territorial waters or skies.

While China has conducted similar operations in the past, including one in May, the latest large-scale military drills close to Japanese islands come after Japan announced it would double defence spending over the next five years in a bid to deter China from using its military to push territorial claims in the region, including against neighbouring Taiwan.

Japan also reported that it had detected a flight by a Chinese WZ-7 drone on Sunday close to Miyakojima, the first time it has spotted the high-altitude drone in the area.

<https://economictimes.indiatimes.com/news/defence/japan-says-it-scrambled-jets-to-monitor-chinese-aircraft-carrier-operations/articleshow/96679807.cms>

Mon, 02 Jan 2023

US Approves Sale of Volcano Anti-tank Systems to Taiwan

In a recent press release, the US Defense Security Cooperation Agency (DSCA) announced a proposed sale of Volcano (vehicle-launched) anti-tank munition-laying systems, M977A4 heavy expanded mobility tactical truck (HEMTT) 10-ton cargo trucks, and M87A1 anti-tank munitions to Taiwan. The deal also included the training and test of munitions, and related elements of spare parts, engineering, technical, logistical, and other programme support.

The DSCA said that the deal served the “US national, economic, and security interests by supporting the recipient's continuing efforts to modernise its armed forces and maintain a credible defensive capability”. The sale of anti-tank systems will support Taiwan in improving security and maintaining political stability, military balance, and economic progress in the region, the DSCA added.

The proposed sale will improve Taiwan's “capability to meet current and future threats by providing a credible force capable of deterring adversaries and participating in regional operations”, the DSCA continued. The principal contractors in the deal will be Northrop Grumman for the production of munition canister mines, and Oshkosh Corporation for the production of the M977A4 HEMTT vehicles.

The DSCA said that it had notified Congress of the possible sale of anti-tank systems. The sale was notified amid China ramping up its military activities along Taiwan Strait. On 27 December, Janes reported that the Chinese military aircraft conducted the largest breach of the Taiwan Strait median line to date.

Janes assessed that about 34–43 combat aircraft crossed the median line over a 24-hour period between 0600 h local time on 25 December and 0600 h local time on 26 December. The median line is the de facto sea border separating China from Taiwan.

Taiwan's Ministry of National Defense (MND) said in a press release on 29 December 2022 that the sale of Volcano anti-tank systems would begin in a month. “The Chinese Communist Party's frequent military activities near Taiwan have posed severe military threats to us [Taiwan]. The US continues to provide defensive weapons to our country, which is the basis for maintaining regional stability and peace,” the MND said.

The anti-tank system would “have high manoeuvrability and rapid mine-laying effectiveness and can respond quickly to enemy threats, which will help improve the national military's asymmetric combat capabilities”, the MND added. According to Janes EOD and CBRNE Defence Equipment, the Volcano can rapidly dispense up to 960 mines from expendable canisters mounted on as many as four launcher racks.

The mine delivery speed of the system is from eight to 88 km/h for ground vehicles and from 20 to 120 kt for helicopters. At a ground speed of 88 km/h, 960 mines can be dispensed in 43 seconds.

A helicopter flying at 120 kt can dispense 960 mines in 17 seconds. A typical Volcano-dispersed minefield strip is 125 m wide and 1,150 m long.

<https://www.janes.com/defence-news/weapons-headlines/latest/us-approves-sale-of-volcano-anti-tank-systems-to-taiwan>



Mon, 02 Jan 2023

NATO Military Chiefs of Defence Meeting - 18-19 January 2023

NATO's highest Military Authority, the Military Committee, will meet in person on 18-19 January 2023, in Brussels, Belgium. Admiral Rob Bauer, Chair of the Military Committee, will preside over the meeting, which will be attended by the Allied Chiefs of Defence and their counterparts from Invitees Finland and Sweden. They will be supported by General Christopher Cavoli, Supreme Allied Commander Europe (SACEUR), and General Philippe Lavigne, Supreme Allied Commander Transformation (SACT), who will each lead a session.

The meeting of the NATO Military Committee in Chiefs of Defence Session (MCCS) will enable the 32 Chiefs of Defence, to meet and discuss issues of strategic importance to the Alliance. The NATO Secretary General, Mr. Jens Stoltenberg will join the Military Committee for the first session to provide the latest political objectives and to discuss security challenges facing the Alliance.

Supreme Allied Commander Transformation, General Lavigne, will lead the second session of the day. It will focus on early observations from the ongoing war in Ukraine, and the acceleration of the implementation of the NATO Warfighting Capstone Concept and the Warfare Development Agenda. The Chiefs of Defence will discuss NATO's military capacity and capability to defend the Alliance against all challenges, now and in the future. This will include a discussion on multi-domain operations, digital transformation and interoperability.

General Cavoli, Supreme Allied Commander Europe, will lead the third session of the day. He will provide an update on the Alliance's implementation of the Concept for the Deterrence and Defence of the Euro-Atlantic Area. This 'deter and defence strategy' provides a common framework for military activity in peace, crisis, and conflict. It closely interlinks national plans with NATO military plans and takes into account threats and challenges specific to particular regions, domains, and functional areas.

The fourth session will be on NATO Readiness and Sustainment of military forces, in particular risks and mitigations. This session will centre on capability development, military stockpiles and logistics. The first session of the second day will see the Chiefs of Defence meet with their Kosovo Force (KFOR) operational partners – Armenia, Austria, Finland, Ireland, Moldova, Sweden, Switzerland, and Ukraine. The discussions will concentrate on the situation on the ground, the security environment, and KFOR's mission. The Military Committee will then discuss NATO's non-combat and capacity building Mission in Iraq with their operational

partners Sweden, Finland and Australia. The Chiefs of Defence will discuss the Mission's ongoing efforts to assist Iraq in promoting greater stability, building its security and defence institutions, and eradicating terrorism.

The final session will see the Military Committee discuss NATO's ongoing support to Ukraine.

https://www.nato.int/cps/en/natohq/news_210397.htm



Tue, 03 Jan 2023

Seoul Says Talks Underway Over Joint Nuclear Exercises with US

Seoul and Washington are discussing joint planning and exercises involving US nuclear assets to counter growing threats from the North, South Korea's presidential office said Tuesday after US President Joe Biden said there would be no such joint drills.

The statement was released after Biden said the United States was not discussing joint nuclear exercises with South Korea, seemingly contradicting comments by Seoul's President Yoon Suk-yeol earlier this week.

The two security allies are "in talks over information-sharing, joint planning and the joint implementation plans that follow with regard to the operation of US nuclear assets to respond to North Korea's nuclear weapons", Yoon's office said in a statement.

In an interview with the Chosun Ilbo newspaper published Monday, Yoon said the United States' existing "nuclear umbrella" and "extended deterrence" were no longer enough to reassure South Koreans. "The nuclear weapons belong to the United States, but the planning, information sharing, exercises and training must be done jointly by South Korea and the United States," Yoon said, adding that the US was "quite positive" about the idea. Hours after that interview was published, Biden gave an emphatic "no" in response to a question on whether the two sides were considering joint nuclear exercises.

Yoon's office acknowledged Biden's response but said the US president had been "left with no options but to answer 'No' when directly asked... without any context". "Joint nuclear exercise is a term only used by nuclear powers," said Kim Eun-hye, a spokeswoman for the South Korean president's office.

The back and forth comes after the North's leader Kim Jong Un called for an "exponential" increase in his country's nuclear arsenal and new intercontinental ballistic missiles (ICBMs) to counter what it termed US and South Korean hostility. In 2022, the North conducted sanctions-defying weapons tests nearly every month, including firing its most advanced ICBM ever. Under the hawkish Yoon, South Korea has beefed up joint military drills with the United States, which had been scaled back during the pandemic or paused for a bout of ill-fated diplomacy with the North under his predecessor.

<https://www.newindianexpress.com/world/2023/jan/03/seoul-says-talks-underway-over-joint-nuclear-exercises-with-us-2534283.html>

Science & Technology News



Press Information Bureau
Government of India

Ministry of Science & Technology

Mon, 02 Jan 2023

The 108th Indian Science Congress being Inaugurated at Nagpur Tomorrow by Prime Minister Sh Narendra Modi will Focus on Sustainable Development with Inclusive Involvement of All Sections of Society Including Women

The focal theme of this year's Science Congress has been very thoughtfully finalized as "Science & Technology for Sustainable Development with Women Empowerment".

A unique hallmark of the Indian Science Congress this year would be "Children Science Congress"

Plenary Sessions will feature Nobel Laureates, leading Indian and foreign researchers, experts and technocrats from a wide variety of fields, including Space, defense, IT and medical research.

A major attraction will be a mega expo "Pride of India" to showcase significant contributions largely of Indian Science and Technology to the society

The 108th Indian Science Congress being inaugurated at Nagpur tomorrow by Prime Minister Narendra Modi will focus on sustainable development with inclusive involvement of all sections of society including women. Stating this in a pre-conference briefing to the media, Union Minister of State (Independent Charge) for Science and Technology & Earth Sciences, Dr. Jitendra Singh said that the focal theme of this year's Science Congress has been very thoughtfully finalized as "Science & Technology for Sustainable Development with Women Empowerment". He said, the Conference will deliberate on holistic growth, reviewed economies and sustainable goals, while at the same time address the possible obstacles to the growth of women in science & technology.

The Minister said, a unique hallmark of the Indian Science Congress this year would be "Children Science Congress" being organized to provide opportunity to children to use their scientific temperament and knowledge and to realize their creativity through scientific experiment.

Dr Jitendra Singh also pointed to a new event being added to this year's Science Congress in the form of what has been titled as "Tribal Science Congress". This will seek to showcase the empowerment of tribal women and also provide a platform for display of indigenous accent knowledge system and practice. The Plenary Sessions, the Minister informed, will feature Nobel

Laureates, leading Indian and foreign researchers, experts and technocrats from a wide variety of fields, including space, defense, IT and medical research. The technical sessions will showcase path-breaking and applied research in Agriculture and Forestry Sciences, Animal, Veterinary and Fishery Sciences, Anthropological and Behavioural Sciences, Chemical Sciences, Earth System Sciences, Engineering Sciences, Environmental Sciences, Information and Communication Science & Technology, Material Sciences, Mathematical Sciences, Medical Sciences, New Biology, Physical Sciences, and Plant Sciences, he added.

Dr Jitendra Singh also referred to a special attraction of the event, the mega expo “Pride of India” which will display the strengths and achievements of Government, Corporate, PSUs, Academic and R&D Institutes, Innovators & Entrepreneurs from all across the country. Prominent developments, major achievements and the significant contributions largely of Indian Science and Technology to the society will be showcased in the exhibition.

Apart from these 14 sections, there will be a Women’s Science Congress, a Farmers’ Science Congress, a Children’s Science Congress, a Tribal Meet, a section on Science and Society and a Science Communicators’ Congress.

Among the top dignitaries who will grace the inaugural session are Governor of Maharashtra and Chancellor of Maharashtra Public Universities, Bhagat Singh Koshyari, Union Minister and Chairman of the Advisory Committee of RTMNU Centenary Celebrations, Nitin Gadkari, Union Minister of State (Independent Charge) for Science and Technology & Earth Sciences, Dr. Jitendra Singh and Deputy Chief Minister of Maharashtra, Devendra Fadnavis.

Vice Chancellor of Rashtrasant Tukadoji Maharaj Nagpur University, Dr. Subhash R. Chaudhari, and General President of Indian Science Congress Association (ISCA), Kolkata, Dr. (Mrs.) Vijay Laxmi Saxena will be prominently present.

Vigyan Jyot - Flame of Knowledge - was conceived on the lines of the Olympic flame. It is a movement dedicated to nurturing scientific temper in the society, especially the youth. The flame, installed at the University campus, will continue to be alight until the end of the 108th Indian Science Congress.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1888038>



Tue, 03 Jan 2023

गगनयान मिशन के एस्ट्रोनॉट्स की सीक्रेट ट्रेनिंग: 10 फीट गहरे पानी में सीख रहे जीरो गैविटी में कैसे जिएं, 2024 में लॉन्च

लेखक: अक्षय बाजपेयी

बेंगलुरु का ओल्ड एयरपोर्ट रोड। इलाका- मारतल्ली। यहीं वो सीक्रेट जगह है, जहां गगनयान मिशन के लिए 4 भारतीय एस्ट्रोनॉट्स यानी अंतरिक्ष यात्रियों की ट्रेनिंग चल रही है। इन्हें घंटों

गहरे पानी में प्रैक्टिस करवाई जा रही है, ताकि जीरो गैविटी यानी गुरुत्वाकर्षण के बिना रहना सीख पाएं। खास तरह के सिम्युलेटर (डमी कैप्सूल) में तेजी से घुमाया जा रहा है, ताकि उन्हें स्पेसक्राफ्ट में परेशानी न हो। हर रोज 4 से 6 घंटे बेहद मुश्किल एक्सरसाइज करवाई जा रही है, ताकि स्पेस में बाँड़ी में ब्लड सर्कुलेशन बना रहे। ट्रेनिंग ले रहे चारों टेस्ट पायलट इंडियन एयरफोर्स के हैं।

इस मिशन से जुड़े टॉप सीनियर साइंटिस्ट ने हमें ट्रेनिंग से जुड़ी कई बातें बताई हैं, लेकिन अपना नाम देने से इनकार कर दिया। उन्होंने बताया कि एस्ट्रोनॉट के लिए इंडियन एयरफोर्स के पायलट्स को इसलिए चुना गया, क्योंकि वो इसकी ट्रेनिंग से काफी हद तक वाकिफ होते हैं। ट्रेनिंग के कोई फिक्स घंटे नहीं होते, ये डे टू डे रिक्वायरमेंट के हिसाब से बदलती है। एक साल रूस में ट्रेनिंग लेने के बाद बीते करीब 5 महीने से बेंगलुरु में ट्रेनिंग चल रही है। सिक्योरिटी रीजन की वजह से एस्ट्रोनॉट्स के नाम का खुलासा नहीं किया गया है। बीते एक हफ्ते में हमने गगनयान मिशन के बारे में तमाम जानकारियां जुटाईं। बेंगलुरु के उस एरिया में घूमे, जहां एस्ट्रोनॉट्स की ट्रेनिंग हो रही है। उनके लिए कोर्स डिजाइन करने वाले एक्सपर्ट और ISRO के तमाम साइंटिस्ट्स से बात की।

4 लोगों को ट्रेनिंग दी जा रही है, लेकिन अंतरिक्ष में कितने भेजे जाएंगे, यह अभी तय नहीं है। अभी पूरा मिशन डेवलपमेंट स्टेज में है। हो सकता है दो एस्ट्रोनॉट्स जाएं या तीन। वे वहां कितने दिन रुकेंगे, इस पर भी फैसला नहीं हुआ है, क्योंकि अभी कई टेस्ट होने हैं। इनका जो रिजल्ट आएगा, उसी से तय होगा कि एस्ट्रोनॉट कितने दिन रुकेंगे। ये टाइम 12 घंटे से लेकर 72 घंटे तक हो सकता हो। एस्ट्रोनॉट्स गगनयान से बाहर नहीं जाएंगे, सिर्फ यान के अंदर एक्टिविटी करेंगे।

भारत के सपनों का गगनयान, मिशन कामयाब रहा तो चौथे देश होंगे

अब तक रूस, अमेरिका और चीन ही इंसानों को अंतरिक्ष में भेज पाए हैं। सोवियत रूस ने 12 अप्रैल 1961 को यूरी गागरिन को स्पेस में भेजकर पहली बार ये कारनामा किया था। अगले महीने यानी 5 मई 1961 को एलन शेफर्ड अंतरिक्ष में जाने वाले पहले अमेरिकी एस्ट्रोनॉट बने। चीन को ये कामयाबी 2003 में मिली। अगर गगनयान मिशन कामयाब रहा तो भारत स्पेस में इंसान भेजने वाला चौथा देश होगा।

इंडियन स्पेस रिसर्च ऑर्गनाइजेशन यानी ISRO ने इस पूरे मिशन को सीक्रेट रखा है। एस्ट्रोनॉट्स के लिए ट्रेनिंग प्रोग्राम डिजाइन करने वाले एक्सपर्ट्स को भी उनसे बातचीत करने की इजाजत नहीं दी गई।

70 में से 4 लोग चुने गए, चारों की उम्र 40 साल से कम

ISRO को एस्ट्रोनाट ट्रेनिंग के लिए 70 फॉर्म मिले थे। बेंगलुरु के इंस्टीट्यूट ऑफ एयरोस्पेस मेडिसिन (IAM) में मेडिकल स्क्रीनिंग और फिजिकल टेस्ट के बाद 4 बेस्ट एप्लीकेंट को चुना गया। टेस्ट पायलट होने की वजह से इनके पास सबसे ज्यादा जोखिम में जहाज उड़ाने का एक्सपीरियंस है।

रूस में 13 महीने चली ट्रेनिंग, बेसिक वहीं से सीखे

चारों टेस्ट पायलट को फरवरी 2020 में ट्रेनिंग के लिए रूस भेजा गया था। रूस इसलिए, क्योंकि अंतरिक्ष में इंसानों का भेजने का सबसे लंबा और सबसे सफल अनुभव रूस के ही पास है, और वह हमारा सहयोगी भी है।

वहां करीब 13 महीने ट्रेनिंग चली। ये ट्रेनिंग रूस के स्पेसक्राफ्ट के मुताबिक थी, जबकि हम इस बार अंतरिक्ष में स्वदेशी स्पेसक्राफ्ट भेजने वाले हैं। इसलिए रूस में सिर्फ उन चीजों से फैमिलियर करवाया गया था, जो कॉमन हैं। जैसे, अंतरिक्ष में गुरुत्वाकर्षण यानी ग्रैविटेशन फोर्स नहीं होती। इससे आदमी हर समय हवा में उड़ता रहता है। अंतरिक्ष यात्रियों को ग्रैविटेशन फोर्स न होने पर कैसे रहना है, ये सिखाया गया। इसके लिए पानी में 8 से 10 फीट की गहराई में ले जाकर ट्रेनिंग दी गई।

हार्ट रेट बढ़ाने और रिड्यूस करने की भी ट्रेनिंग

हमने स्पेस ग्रुप ऑफ कंपनीज के फाउंडर और चेयरमैन सचिन भांबा से जाना कि एस्ट्रोनाट बनना कितना मुश्किल है, और इसके लिए किस तरह की ट्रेनिंग दी जाती है। भांबा कहते हैं- 'एस्ट्रोनाट बनने के लिए अच्छी फिटनेस बहुत जरूरी है। जब हम झूले पर बैठते हैं और झूला गोल-गोल घूमना शुरू करता है तो हमें मितली या उल्टी जैसा फील होने लगता है।

इसी तरह स्पेस में जाने के बाद गुरुत्वाकर्षण महसूस नहीं होता और बॉडी रोटेट होती रहती है, ऐसे में दिमाग को इस बात के लिए तैयार करना होता है। दिमाग को सिखाया जाता है कि स्पेस में जाने के बाद वो पेट को ग्रैविटेशनल फोर्स फील नहीं होने का सिग्नल न दें, जिससे उल्टी जैसा फील नहीं होता। इसके लिए एस्ट्रोनाट्स को कई-कई घंटे मशीनों में गोल-गोल घुमाया जाता है। ये ट्रेनिंग के सबसे अहम हिस्सों में से एक है।

वाइटल ऑर्गंस की खूब एक्सरसाइज करवाई जाती है, क्योंकि स्पेस में मदद के लिए कोई और नहीं होगा, रिमोटली ही मदद की जा सकेगी। शरीर के इंटरनल ऑर्गन्स की एक्सरसाइज करवाई जाती है। हार्ट रेट बढ़ाना और फिर उसे रिड्यूस करना सिखाया जाता है।

धरती पर ग्रैविटेशन फोर्स काम करती है। हम खड़े न हों, तब भी हमारी हड्डियों पर प्रेशर बना रहता है। स्पेस में जाते ही शरीर को यह महसूस होता है कि किसी भी कोशिका पर प्रेशर नहीं

पड़ रहा। हड्डियां कैल्शियम कम करना शुरू कर देती हैं। ट्रेनिंग में इस तरह की कंडीशन को मैनेज करना सिखाया जाता है।

स्पेस में हमें कृत्रिम ऑक्सीजन मिलती है। इसका लेवल भी धरती से कम होता है। इसलिए ऐसी एक्सरसाइज करवाई जाती हैं, जिससे हमारा हार्ट ऐसी कंडीशन में शरीर की सभी कोशिकाओं को ऑक्सीजन पहुंचाने के लिए प्रियेयर रहे।

स्पेस में छोटे-छोटे काम करना भी बहुत चैलेंजिंग है। जैसे, धरती पर हम कोई स्कू आसानी से टाइट कर लेते हैं, क्योंकि गैविटेशनल फोर्स काम कर रही होती है, लेकिन स्पेस पर स्कू टाइट करेंगे तो आप समझ नहीं पाएंगे कि आप घूम रहे हैं या स्कू घूम रहा है।

चारों एस्ट्रोनॉट्स के लिए रूस से ही कस्टमाइज स्पेस सूट भी खरीदे गए हैं, ये अंतरिक्ष की जरूरतों के हिसाब से तैयार किए गए हैं। इसके अलावा स्पेस मेडिसिन, लॉन्च व्हीकल, स्पेसक्राफ्ट सिस्टम और ग्राउंड सपोर्ट इंफ्रास्ट्रक्चर की ट्रेनिंग दी गई है।

बेंगलुरु में गगनयान के सिम्युलेटर में चल रही ट्रेनिंग

भारत में एस्ट्रोनॉट्स को गगनयान मिशन की स्पेसिफिक ट्रेनिंग दी जा रही है। ISRO के सीनियर साइंटिस्ट के मुताबिक, सिम्युलेटर के जरिए उन्हें स्पेस का लाइव एक्सपीरियंस दिया जा रहा है। देखा जा रहा है कि किन एक्टिविटी को करने में वो अटक रहे हैं, और कौन सी एक्टिविटी आसानी से कर पा रहे हैं।

ट्रेनिंग वाली जगह इंस्टीट्यूट ऑफ एयरोस्पेस मेडिसिन (IAM) और इसरो सैटेलाइट इंटीग्रेशन एंड टेस्टिंग इस्टेब्लिमेंट (ISITE) के नजदीक है। मिशन से जुड़े लोगों के अलावा यहां किसी को भी जाने की परमिशन नहीं है। चारों एस्ट्रोनॉट्स को फैमिली के साथ रहने की इजाजत है, लेकिन परिवारों को भी मिशन से जुड़ी जानकारी नहीं दी गई है।

राकेश शर्मा और उनके साथी रहे रवीश मल्होत्रा ने बनाया सिलेबस

इस मिशन के लिए दो मॅबर की कमेटी ने सिलेबस तैयार किया है। इसमें रूस के मिशन पर पहली बार भारत से अंतरिक्ष गए राकेश शर्मा और उनके साथी रवीश मल्होत्रा शामिल हैं।

रवीश कहते हैं- स्पेस में भेजने के लिए, हमने जो कैप्सूल तैयार किया है, उसकी कैपेसिटी एक बार में तीन लोगों को ले जाने की है। लेकिन ऐसा हो सकता है कि पहली बार में दो ही यात्रियों को अंतरिक्ष में भेजा जाए। एक जो रह जाएगा, उन्हें दूसरे राउंड में किसी ओर के साथ भेजा जाएगा। एक बार हम अपने लोगों को अंतरिक्ष से सुरक्षित वापस ले आए, तो फिर हमारे लिए वहां आना-जाना चैलेंजिंग नहीं रहेगा। ISRO की तो लंबे वक्त से वहां स्पेस स्टेशन बनाने की

योजना है। अभी जापान-अमेरिका के पास अपने स्पेस स्टेशन हैं, वहां हमारे लिए कई तरह की पाबंदियां हैं। ISRO अपना स्पेस स्टेशन बना लेगा तो इन पाबंदियों से छुटकारा मिल जाएगा।

मल्होत्रा कहते हैं, हमने कुल 3 सेमेस्टर का सिलेबस तैयार किया है। अभी दूसरा सेमेस्टर चल रहा है। रूस में इन लोगों को सिर्फ प्राइमरी प्रोसीजर से रूबरू करवाया गया है। अभी जिन सिम्युलेटर्स पर इन्हें ट्रेनिंग दी जा रही है, वे इंडियन स्टैंडर्ड्स के हैं। हमारे इक्विपमेंट हैं। इनसे पूरी तरह से फैमिलियर होना जरूरी है। एस्ट्रोनॉट्स जब स्पेस में होंगे, तब ISRO के साइंटिस्ट उनसे टीवी स्क्रीन के जरिए कनेक्टेड रहेंगे। कोई प्रॉब्लम होने पर उन्हें गाइड किया जा सकेगा, लेकिन फिजिकली मदद करने के लिए वहां कोई नहीं होगा। रूस में रहकर हमारे अंतरिक्ष यात्रियों ने रशियन लैंग्वेज भी सीख ली है, लेकिन हमारी कम्युनिकेशन की लैंग्वेज इंग्लिश ही होगी, ISRO में वर्किंग लैंग्वेज इंग्लिश ही है।

गगनयान के लिए कई तरह की टेक्नोलॉजी को डेवलप किया जा रहा है। जैसे, ह्यूमन रेटेड लॉन्च व्हीकल, जिसके जरिए क्रू को सुरक्षित धरती पर लाया जाएगा। पहले बिना क्रू मेंबर्स का फ्लाइट मिशन होगा, जिसका मकसद ह्यूमन रेटेड लॉन्च व्हीकल, मिशन मैनेजमेंट, कम्युनिकेशन सिस्टम और रिकवरी ऑपरेशन का परफॉर्मेंस देखना है। एस्ट्रोनॉट्स को ले जाने वाले ह्यूमन रेटेड लॉन्च व्हीकल GSLV-MK3 और LVM3 तैयार हो चुके हैं।

कुमार बताते हैं, ह्यूमन रेटिंग में एडिशनल सेफ्टी रखी जाती है। इसे आप ऐसे समझ सकते हैं कि, जब किसी रॉकेट में इक्विपमेंट या बैलून लॉन्च किए जाते हैं, तो उससे कई गुना ज्यादा सेफ्टी ह्यूमन रेटिंग में रखी जाएगी, क्योंकि सबसे जरूरी क्रू मेंबर्स की सेफ्टी ही है।

आगे महिला एस्ट्रोनॉट भेजने और स्पेसवॉक का प्लान

ISRO के सीनियर साइंटिस्ट के मुताबिक, इस बार हमारे एस्ट्रोनॉट्स स्पेसक्राफ्ट से बाहर नहीं निकलेंगे। स्पेस में जाने के बाद स्पेसक्राफ्ट धरती के चक्कर लगाएगा। मिशन कितने दिनों तक चलेगा, यह आगे के डेवलपमेंट से तय होगा, लेकिन हम 12 से 72 घंटे तक यात्रियों को वहां रोक सकते हैं।

पहली बार में हम अंतरिक्ष यात्रियों को सुरक्षित वापस लाने में कामयाब हो जाएंगे, तब दूसरी बार में हो सकता है कि हम उन्हें स्पेसवॉक भी करवाएं। इस तरह आगे के मिशन में ISRO की किसी सीनियर महिला साइंटिस्ट को भी अंतरिक्ष में भेजा जा सकता है। वो क्रू का हिस्सा होंगी, लेकिन ये काम स्टेप बाय स्टेप ही होंगे। अमेरिका, रूस और चीन ने भी इसी तरह अपने मिशन को आगे बढ़ाया है। हमारा मिशन सक्सेस होने के बाद बाकी देशों के मुकाबले काफी सस्ता होगा। हमने अंतरिक्ष यात्रियों के लिए ट्रेनिंग सेंटर बनाया है, वो टेम्परेरी है। इसे सिर्फ गगनयान के

हिसाब से बनाया गया है, लेकिन भविष्य में हम बेंगलुरु से 200 किमी दूर एक स्थायी सेंटर बनाएंगे। अभी पूरा फोकस गगनयान की कामयाबी पर है।

रूस के अलावा ऑस्ट्रेलिया, कनाडा और रोमानिया भी मिशन में शामिल

गगनयान मिशन के लिए भारत 6 से ज्यादा देशों के साथ मिलकर काम कर रहा है। एस्ट्रोनॉट्स की ट्रेनिंग रूस में हुई। स्पेस मेडिसिन में फ्रांस का सपोर्ट लिया जा रहा है। विंड टनल टेस्टिंग के लिए कनाडा और रोमानिया के साथ काम किया जा रहा है। ग्राउंड स्टेशन सपोर्ट के लिए ऑस्ट्रेलिया और यूरोपियन स्पेस एजेंसी के साथ मिलकर काम हो रहा है।

पहले दो अनकूड मिशन लॉन्च किए जाएंगे

PM मोदी ने 2018 में गगनयान मिशन का ऐलान किया था, तब कहा था कि 'भारत का कोई बेटा या बेटी अंतरिक्ष में स्वदेशी गगनयान से पहुंचेगा।' ये तय हो चुका है कि, भारत का कोई बेटा ही स्वदेशी गगनयान से 2024 के आखिर में अंतरिक्ष में कदम रखेगा, क्योंकि गगनयान मिशन के लिए चुने गए चारों टेस्ट पायलट पुरुष हैं। इसरो ने 3 मेंबर्स को 3 दिन के लिए स्पेस में ले जाने की बात कही है।

2024 के आखिरी क्वार्टर में लॉन्च होने वाले ह्युमन स्पेस फ्लाइट मिशन (H1) के पहले दो अनकूड मिशन लॉन्च किए जाएंगे। इसमें एक 2023 के आखिरी क्वार्टर और दूसरा 2024 के सेकेंड क्वार्टर में होगा।

<https://www.bhaskar.com/db-original/news/isro-gaganyaan-spaceship-project-details-test-pilot-training-in-russia-130754260.html>



Mon, 02 Jan 2023

South Asian Black Carbon Aerosols Increase Glacial Mass Loss over Tibetan Plateau: Study

Black carbon aerosols have indirectly affected the mass gain of the Tibetan Plateau glaciers by changing long-range water vapour transport from the South Asian monsoon region, a study has found. The South Asia region adjacent to the Tibetan Plateau has among the highest levels of black carbon emission in the world, the researchers said.

Black carbon aerosols are produced by the incomplete combustion of fossil fuels and biomass, and are characterised by strong light absorption. Many studies have emphasised black carbon aerosols from South Asia can be transported across the Himalayas to the inland region of the Tibetan Plateau. Researchers noted that black carbon deposition in snow reduces the albedo of surfaces -- a measure of how much of Sun's radiations are reflected -- which may accelerate the

melting of glaciers and snow cover, thus changing the hydrological process and water resources in the region.

The study, published in Nature Communications, found that since the 21st century, South Asian black carbon aerosols have indirectly affected the mass gain of the Tibetan Plateau glaciers by changing long-range water vapour transport from the South Asian monsoon region.

"Black carbon aerosols in South Asia heat up the middle and upper atmosphere, thus increasing the North—South temperature gradient," said Professor KANG Shichang from Chinese Academy of Sciences (CAS). "Accordingly, the convective activity in South Asia is enhanced, which causes convergence of water vapour in South Asia. Meanwhile, black carbon also increases the number of cloud condensation nuclei in the atmosphere," Shichang said.

These changes in meteorological conditions caused by black carbon aerosols make more water vapour form precipitation in South Asia, and the northward transport to the Tibetan Plateau was weakened, the researchers said.

As a result, precipitation in the central and the southern Tibetan Plateau decreases during the monsoon, especially in the southern Tibetan Plateau, they said. The decrease in precipitation further leads to a decrease of mass gain of glaciers.

From 2007 to 2016, the reduced mass gain by precipitation decrease accounted for 11% of the average glacier mass loss on the Tibetan Plateau and 22.1% in the Himalayas. "The transboundary transport and deposition of black carbon aerosols from South Asia accelerate glacier ablation over the Tibetan Plateau. "Meanwhile, the reduction of summer precipitation over the Tibetan Plateau will reduce the mass gain of plateau glaciers, which will increase the amount of glacier mass deficit," Shichang added.

<https://www.thehindu.com/sci-tech/energy-and-environment/south-asian-black-carbon-aerosols-increase-glacial-mass-loss-over-tibetan-plateau/article66329434.ece>

