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THE TIMES OF INDIA

Sat, 23 Apr 2022

Indian Army tanks to be equipped with advanced smoke grenades

The Indian Army's battle tanks and Infantry Fighting Vehicles (BMPs) will soon be equipped with advanced 81mm smoke grenades to 'confuse' the enemy forces on the battlefield.

The grenade emits a thick layer of smoke to obscure the enemy's tank for at least for 40 seconds — sufficient time to get into a strategic position to counter adversaries.

It has been developed by the city-based High Energy Materials Research Laboratory (HEMRL) of the Defence Research and Development Organisation (DRDO).



The army has carried out extensive testing to verify its efficacy in different terrains and temperatures. It has been tested at temperatures of over 45 degrees Celsius in deserts and -15 degrees Celsius in northern border areas.

“The grenade has met all operational requirements of the army during various trials,” KPS Murthy, director, HEMRL, told TOI.

The technology of the grenade has been transferred to the Ordnance Factory Dehu Road and a private company in Nagpur for mass manufacturing of the product, added the scientist.

“The existing grenades have limitations. The enemies' tanks and BMPs equipped with anti-thermal and anti-laser systems can now spot the Indian tanks and Infantry Fighting Vehicles easily. The newly-developed grenades have defeated the anti-thermal and anti-laser systems. This is a big advantage for the force for operational purposes,” said another official from the DRDO. The factory and the firm had delivered the first consignment of grenades, which were extensively tested by the army.

“The army is satisfied with the results. Now, the grenades will be manufactured in larger quantities,” added the official. The foreign countries' tanks and IFVs are equipped with this kind

of grenades. It has export potential, but no foreign country has evinced interest in it so far, the sources said.

A senior army officer from the Armoured Corps told TOI, “The existing smoke grenade discharger is not effective. Its limitations have surfaced time and again during internal exercises. A tank can fire 12 grenades in a salvo.” The Indian Army has main battle tanks-Arjun, T-90s Bhisma and T- 72 Ajeya and the mechanised infantry has BMP-II (Sarath)

<https://timesofindia.indiatimes.com/city/pune/indian-army-tanks-to-be-equipped-with-advanced-smoke-grenades/articleshow/91016354.cms>



Mon, 25 Apr 2022

India will soon get a Combat Drone

The war in Ukraine has once again highlighted the role of drones in combat. Currently, Indian forces are dependent on foreign-made drones, and that too to gather intelligence. But soon, India will have a drone that can be used in armed missions. DRDO scientists are also working with a Coimbatore-based private firm on an indigenous engine for Tapas.... As of now, close to 75 per cent of the drone is India-made. Tapas-BH-201, developed by the Bengaluru-based Aeronautical Development Establishment (ADE), recently achieved an altitude of 28,000ft and 18 hours of endurance. The agency, under the DRDO, began developing the medium-altitude long-endurance (MALE) unmanned aerial vehicle a decade ago at a cost of Rs1,540.74 crore; it was later revised to Rs1,786 crore.

“We have a good structural design,” said ADE director Y Dilip. “This is the first time an India-made drone is going for the certification process. And, very soon, it will be inducted into the armed forces.” The Centre for Military Airworthiness and Certification (CEMILAC) now has to certify the drone for its airworthiness by checking its load factors, safety and airframe design. The armed forces had not shown much interest in earlier India-made drones, probably due to delayed timelines; the forces continued to depend on Israel-made UAVs like Heron and Searcher. Though Tapas is primarily used for surveillance, it can also carry weapons. “It is pre-designed to carry certain weapons and can be converted into an armed platform,” said Dilip. Tapas has a range of sensors that make it capable of day and night missions, and it also has autonomous take-off and landing capabilities. It is designed only for small missions and can carry a limited payload of 150 kg.

The armed forces were especially impressed by the drone’s advanced ground control system. “Now, we have completed the two major requirements of our armed forces—altitude at which the bird can fly and endurance (hours spent in sky),” said S. Rajagopal, project director of Tapas. “When it landed, Tapas still had about eight hours of fuel left. So, we have calculated its endurance up to 18 hours. Despite our best efforts, we are slightly short of the armed forces’ requirements. But a majority of requirements have been met.” Hindustan Aeronautics Limited will produce the first five Tapas drones. The company is expected to get the drawings for production by May. Between September and April, HAL will do staggered delivery.

The flight control systems, avionics and data-linked systems for the first five Tapas drones are ready. As soon as the airframe is ready, these systems can be fitted quickly. The engines have already been ordered. “We have the planning in place to make a complete aircraft; systems can be equipped quickly,” said Dilip. “We will train the HAL team on the integration of the first two birds. For the remaining birds, HAL will do the integration themselves.” The ADE will only monitor at the production stage. Bharat Electronics Limited is the primary partner for electronic systems, like on-board avionics. Then, all five Tapas will go in for user evaluation trials. A total of 76 Tapas drones will be inducted into the armed forces—the Army, 60; the Air Force, 12; and the Navy, four. Though the original completion date of the project was 2016, it was extended to 2023. The government has made it clear that there will be no further extension.

DRDO scientists are also working with a Coimbatore-based private firm on an indigenous engine for Tapas. The drone is currently powered by the Austria-made Austro engine, which comes with twin turbochargers. As of now, close to 75 per cent of the drone is India-made. DRDO scientists claim that, once inducted, Tapas would be almost eight times cheaper than imported drones.

<http://www.indiandefensenews.in/2022/04/india-will-soon-get-combat-drone.html>



Mon, 25 Apr 2022

How India Finalised the Design for its Indigenous Stealth Fighter Jet

The circular, three-storey building is quite unremarkable. But, it is home to something hush-hush and hi-tech. It is the headquarters of the Aeronautical Development Agency (ADA) in Vimanapura, an eastern suburb of Bangalore and an aeronautical hub. This is where India’s top defence scientists, helped by 250-odd assistants, are building a fifth-generation stealth fighter. As a fifth-generation stealth fighter, the AMCA is designed for low-observability. That is, it would not be easy to detect it and even when detected the AMCA can ‘disappear’ and get close to the target, giving the enemy little reaction time.

The AMCA project is critical for the IAF. The world’s fourth largest air force is grappling with its depleting combat fleet; it is down to 32 squadrons, against its sanctioned strength of 42. The most important part of the avionics is an “electronic pilot” feature. Conventionally, a fighter platform requires two pilots. The AMCA will have a single cockpit accompanied by an electronic pilot. Stealth technology has so far been dominated by the Americans. Even Russia and China have not developed the capability. Unsurprisingly, the ADA HQ is sheathed in multi-layer security cover. THE WEEK became the first publication to be invited to Vimanapura to report on the Advanced Medium Combat Aircraft (AMCA).

Stealth aircraft are designed to avoid detection by enemy radars or air-defence systems. As a fifth-generation stealth fighter, the AMCA is designed for low-observability. That is, it would not be easy to detect it and even when detected the AMCA can ‘disappear’ and get close to the

target, giving the enemy little reaction time. As Girish S. Deodhare, director general, ADA, explains: “Stealth aircraft are required in the early stages of war to take out the enemy’s air defences. Once you destroy the air defences, other fighters like the LCA (Light Combat Aircraft) can take over.” He said the design of the AMCA was complete. “Now, it is just a matter of making the jet,” he added. A fighter jet has close to 15,000 components and the design of each part has been finalised. Stealth technology is achieved by using a combination of techniques that reduce the reflection or emission of visible light, radar, infrared, radio frequency spectrum and audio. Advanced stealth features include “serpentine air-intake” (which helps reduce infra-red signature), an internal bay for smart weapons (as opposed to wing-mounted weapons) and radar-absorbent material. It can achieve supersonic cruise speeds without the use of afterburners, and will have AESA (active electronically scanned array) radars, which can scan different directions simultaneously.

A single-seater, twin-engine fighter, the AMCA will be 17.6m long, with a wingspan of 11.13m and a maximum take-off weight of 25 tonnes. While the AMCA MK-1 will be a fifth-generation fighter, the MK-2 is likely to be sixth-generation. The Mark-2 will also have indigenously manufactured engines instead of the MK-1’s US made engines (F414 from GE Aviation). Deodhare said that several countries had expressed interest in collaborating on engine development for the MK-2. The project’s initial development cost is estimated to be close to Rs15,000 crore. Experts estimate that the US’s fifth-generation stealth fighters—the F-22 Raptor and the F-35 Lightning II—would have cost around Rs1,86,150 crore and Rs1,06,875 crore, respectively, from the design to development stage. Both were developed by Lockheed Martin. The F-22, the first fifth-generation fighter, was developed in 20 years (1983-2003) and the F-35 in 16 years (1995-2011). As things stand, the first AMCA might roll out by around 2026. It was in 2005, when the F-22 was launched, that the ADA formed a small study group to understand the capabilities of a fifth-generation fighter.

The core group to develop the stealth fighter was formed in 2009 with five defence scientists—Ashish Kumar Ghosh, Krishna Rajendra Neeli, M.B. Angadi, A.K. Vinayagam and Fairoza Naushad. The then deputy chief of the Indian Air Force, N.A.K. Browne, gave them the operational requirements of the IAF. The confidence to attempt the design of a stealth aircraft came from the experience the ADA had gained while designing the Tejas. Ghosh, also known as “Mr AMCA Man”, is the project director. Neeli, the group director, liaises with the ministry of defence and other stakeholders. Vinayagam handles system engineering, Angadi is in charge of configuration (giving shape to the aircraft, and arranging systems and equipment inside), while Fairoza is responsible for avionics.



M.B. Angadi Configuration engineer, A.K. Vinayagam System engineer, Ashish Kumar Ghosh Project director, Krishna Rajendra Neeli Group director & Fairoza Naushad Avionics engineer

When the ADA's attempt began in earnest in 2009, the F-22 was the only fifth-generation stealth fighter in service. It was highly manoeuvrable and could achieve supersonic cruise speeds (at Mach 1.8) without the use of afterburners. "From its technology to capability and its look, a feasibility study was initiated under me with a budget of 090 crore," said Ghosh. He said that from the outset, the team has been interacting with IAF officers to understand the requirements. He added that the TEJAS program had taught the ADA that the development of technologies had to start at the very beginning. "So, we started developing the technologies even while the feasibility study was on," he said. The AMCA team's initial plan was for an all-weather, swing-role fighter jet capable of aerial fights, ground strikes, enemy air defence suppression and electronic warfare. After four years, in 2013, the first feasible configuration was worked out, which was accepted by the IAF. But, in between, a joint venture with Russia to develop a fifth-generation stealth fighter had been initiated following the success of the BrahMos project (an India-Russia JV). The IAF pulled out of the effort in 2018 after several points of contention emerged. For instance, the IAF wanted the capability to upgrade the new fighter without Russian support. Russia refused to share computer source codes that would enable India to do that.

The defence ministry was also pulled in two directions over the two fifth-generation fighter programs. All this led to delays in the AMCA project, before the IAF ultimately decided to concentrate on it. The involvement of IAF pilots in aircraft design had started in 1996 with the creation of the National Flight Test Centre. But, the test pilots were only giving feedback about the performance in the air. Feedback from the ground crew was missing. This meant that critical aspects like readiness and maintenance did not get any attention at the design stage. This eventually led to delays in the LCA project. To resolve this issue, a Project Monitoring Team (PMT) was formed for the AMCA project to look after all the aspects. At present, the PMT comprises of 25 IAF officers and is headed by an air marshal. The PMT participates in all ADA meetings and expedites approvals required from the IAF headquarters. Earlier, the ADA had to write to the defence ministry and wait for months to get the IAF's clearance. Nowadays, all clearances happen in two days. "User (the IAF) involvement is massive nowadays," said Deodhare. "Both sides (the IAF and the ADA) are convinced of what is physically and technologically achievable."

During the ill-fated joint venture with Russia, the Russians used to say that developing stealth technology for combat jets requires joint effort from two to three nations. But, Ghosh and his team managed to do it alone. He said that developing stealth technology in India was earlier considered next to impossible. "Developing the stealth features, its shape, paint coating and radar-absorbent material, is a closely guarded secret," he said. "Though it took a lot of time, each and every material that makes the aircraft stealth has been finalised." Ghosh added that in the AMCA project, there was focus on stealth features and on having high manoeuvrability. The importance of this balance becomes clear from the case of Russia's fifth-generation stealth fighter—the Sukhoi Su-57. It is yet to be inducted, as the Russian military is not satisfied with its stealth design because it is focused more on manoeuvrability. On the other hand, the US seems to have total clarity in its approach. Apart from the two fighters—F-22 and F-35—it also operates the Northrop Grumman B-2 Spirit (a stealth, strategic heavy bomber, with a wingspan wider than a football field).

Ghosh said that balancing manoeuvrability and low-observability is a real challenge. He cited the example of the US's first stealth fighter—the Lockheed Martin F-117 Nighthawk. The F-117 had its maiden flight in 1981 and proved its operational effectiveness during the Gulf War (1990-

1991) and the Balkan conflicts thereafter. Ghosh said that it was designed to drop bombs and not for aerial combat. “The F-117 hardly had any manoeuvrability; it could not avoid a missile attack,” he said. “It was a sitting duck (if it were to be detected by the enemy).” Therefore, during the F-22 program, the US decided that stealth alone was not enough and went for a combination of manoeuvrability and stealth. But, the fighter became so costly that it could not be afforded in large numbers. From its initial plan to have more than 700 F-22s, the US cut down to 173. “They realised that too much of performance plus stealth was not affordable,” said Ghosh. “So, the F-35 was made after downgrading both stealth and maneuverability.”

The IAF has conceptualised its need for only seven squadrons of AMCA (including the Mark-2). Maintaining the stealth features is going to make the AMCA more expensive than other fighters. After giving a meagre Rs90 crore for the feasibility study in 2009, the government approved an additional 0447 crore for design in 2018. Now, the approval of the cabinet committee for security (CCS) is needed to initiate manufacturing. The budget is much higher than the TEJAS program and it will take at least four years after the CCS nod to make the first aircraft. Neeli said that the file was already with the cabinet secretariat and that the CCS approval “should be coming any day now”.

The ADA has planned a 10-year roadmap for making the first five prototypes and for flight testing. The five prototypes will cost close to Rs900 crore each. But, later on in the production process, the cost is expected to reduce drastically. As per defence scientists, prototypes always cost more because they are also test vehicles. However, since the AMCA is largely indigenous, it would be cheaper than an import. The basic aircraft (excluding the cost of weapons, maintenance and upgrades) may be around 50 per cent to 60 per cent cheaper. The lifecycle cost will also be around 70 per cent cheaper.

Apart from the engines for the MK-1, the ejection seats are also imported. All sensors, avionics and flight control systems are indigenous. That means that over 70 per cent of the aircraft is indigenous. Scientists do not want to scale up the indigenous content further because it would not be economically viable. Once the MK-2 engines are developed, the indigenous content will rise to 90 per cent. The AMCA project is critical for the IAF. The world’s fourth largest air force is grappling with its depleting combat fleet; it is down to 32 squadrons, against its sanctioned strength of 42. On what the AMCA can bring to the IAF, a proud Neeli explains that the fighter will have a top speed of around 2,600kmph (Mach 2.15) and a combat range of 1,620km. It will be equipped with a 23mm cannon and 14 hard points to carry weaponry weighing 6,500kg. The fuel capacity is also 6,500kg; the LCA only carries 2,400kg of fuel.

The aircraft is designed to tackle both air-to-air and air-to-ground operations with equal lethality. The AMCA will be fitted with Brahmos-NG (next generation) air-to-ground missiles, Astra air-to-air missiles, anti-tank missiles, Rudram anti-radiation missiles, laser-guided bombs and precision munitions. The avionics for pilot’s communication and sensors, radars and infra-red search-and-tracking features make the fighter “most advanced”, said Fairoza. At 45, Fairoza is the youngest member of the team. The mother of two joined the ADA in 2005, the same year the AMCA study group was founded. “Avionics need to meet the requirements of stealth aircraft,” she said. “We were tasked to develop long-range radars with extended range sensors. The aircraft will also have extended detection sensors (early warning system) and network-centric warfare capability (which will increase coordination among pilots).” She added that another key feature of the AMCA was advanced situational awareness. “This is achieved through multi-spectral sensors placed across the airframe and allows the pilot to have a 360-degree visual without

having to manoeuvre the fighter,” said Fairoza. This, in turn, facilitates “First Look, First Kill”—the AMCA pilot would detect and destroy the target without the enemy ever knowing about the threat. The cockpit will have a 3D audio warning system and the facility for voice-activated commands, reducing the workload of pilots so that they can better focus on missions.

The most important part of the avionics though is an “electronic pilot” feature. Conventionally, a fighter platform requires two pilots. One is a flying pilot and another one is a mission pilot (who directs the flying pilot). “This jet will have only a single cockpit accompanied by an electronic pilot,” said Fairoza. “AMCA can perform a deep-strike without ground support. Even the most advanced fighter jets, like the Dassault Rafale, needs the support of another aircraft or ground support.” She said the F-35 was the only platform that had similar capability. However, she added that she was not sure about the Su-57 or the Chinese Chengdu J-20 (China claims it is a fifth-generation stealth fighter).

The ADA was formed in 1984 as the nodal agency for the TEJAS program with only 60 scientists. Then, India had to start from scratch. But, now, with Tejas, it is part of an elite group of nations that have indigenously developed 4.5-generation, supersonic multirole fighters. The delays in the TEJAS project taught India many valuable lessons. As a result, in 2019, the ministry of defence formed a committee under former DRDO head VK Saraswat to work out the execution model for the AMCA. It was felt that the process of aircraft manufacturing—design by the ADA and manufacture by HAL—needed to change and involve more entities.

After a year of deliberations, the Saraswat committee recommended forming a special purpose vehicle (SPV) with private industry participation, to manufacture the AMCA. Once the cabinet approves manufacture, the ADA will form the SPV with HAL and private players. It is expected that private players will get the majority share in manufacturing. The ADA has already initiated discussions with three private companies to discuss the distribution of responsibility. However the work is shared, one thing is for sure. India’s indigenous stealth fighter will be more than the sum of its parts and it will be cost-efficient.

<http://www.indiandefensenews.in/2022/04/how-india-finalised-design-for-its.html>



पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Fri, 22 Apr 2022 6:15 PM

भारतीय सेना में शामिल किए जाने से पहले इलेक्ट्रिक वाहनों का प्रदर्शन

केंद्रीय रक्षा मंत्री श्री राजनाथ सिंह, सेना प्रमुख तथा भारतीय सेना के वरिष्ठ अधिकारियों के समक्ष 22 अप्रैल, 2022 को नई दिल्ली में इलेक्ट्रिक वाहनों (ईवी) का प्रदर्शन किया गया। टाटा मोटर्स, परफेक्ट मेटल इंडस्ट्रीज (पीएमआई) तथा रिवोल्ट मोटर्स के इलेक्ट्रिक वाहन विनिर्माताओं ने अपने इलेक्ट्रिक वाहन प्रदर्शित किए तथा पिछले कुछ वर्षों के दौरान अर्जित प्रौद्योगिकी तथा प्रचालन के दायरे में वृद्धि के बारे में जानकारी दी। रक्षा मंत्री ने इलेक्ट्रिक वाहनों को शामिल करने तथा सरकार की नीतियों के अनुरूप जीवाश्म ईंधन पर निर्भरता घटाने की भारतीय सेना की पहल की सराहना की। फेम I तथा II की सरकारी नीति ने भारत में इलेक्ट्रिक वाहन परितंत्र को बनाये रखने के लिए बुनियादी ढांचे के विकास को भरपूर बढ़ावा दिया है। इलेक्ट्रिक वाहन के उपयोग को बढ़ावा देने के लिए सरकार द्वारा चार्जिंग स्टेशनों की स्थापना के लिए लाइसेंस लेने की आवश्यकता समाप्त कर दी गई है।

थल सेनाध्यक्ष जनरल एमएम नरवणे का मानना है कि परिवहन का भविष्य इलेक्ट्रिक वाहनों में निहित है तथा भारतीय सेना को इस मामले में एक पथप्रदर्शक बनना होगा तथा इस तकनीक को अपनाने में अग्रणी भूमिका निभानी होगी, भले ही विश्व की सेनाएं अभी भी इलेक्ट्रिक वाहनों को शामिल करने पर विचार ही कर रही हैं। सेनाध्यक्ष के निर्देशों के आधार पर, भारतीय सेना में इलेक्ट्रिक वाहनों को शामिल करने के लिए एक निश्चित समयबद्ध रूपरेखा तैयार करने के लिए पीठासीन अधिकारी के रूप में आपूर्ति एवं परिवहन महानिदेशक (डीजीएसटी) लेफ्टिनेंट जनरल मनोज कुमार सिंह यादव के तहत अधिकारियों के एक बोर्ड को विस्तृत जानकारी प्रदान की गई। अधिकारियों के बोर्ड ने अपनी अनुशंसाओं को अंतिम रूप दे दिया है और लेफ्टिनेंट जनरल मनोज कुमार सिंह यादव ने सेना कमांडरों की बैठक के दौरान इलेक्ट्रिक

वाहनों को शामिल करने की योजना के बारे में सेनाध्यक्ष, सेना के कमांडरों तथा सेना के वरिष्ठ अधिकारियों को जानकारी दी। वर्तमान में, भारतीय सेना तीन श्रेणियों अर्थात् कारों, बसों तथा मोटर साइकिलों में इलेक्ट्रिक वाहनों की खरीद करने की योजना बना रही है।

<https://pib.gov.in/PressReleasePage.aspx?PRID=1819119>



Press Information Bureau
Government of India

Ministry of Defence

Fri, 22 Apr 2022 6:15 PM

Demonstration of Electric Vehicles prelude to the Induction in Indian Army

A demonstration of Electric Vehicles (EVs) was given to the Raksha Mantri Shri Rajnath Singh, Chief of Army Staff and senior officers of the Indian Army in New Delhi on 22 April 2022. Electric Vehicle manufacturers from Tata Motors, Perfect Metal Industries (PMI) and Revolt Motors showcased their EVs and briefed about the enhancement in technology and range of operation achieved during the past few years. Raksha Mantri has appreciated the Indian Army's initiative to induct EVs and reduce dependency on fossil fuels in line with the Government policies. Government's policy of FAME I & II have given tremendous boost to infrastructure development for sustaining the EV ecosystem in India. Setting up of EV charging stations has been delicensed by the Government to facilitate the EV adoption.

Chief of Army Staff General MM Naravane believes that the future in transportation is EVs and Indian Army has to be a torch bearer and lead the way in adoption of this technology even if the world armies are still only contemplating introduction of EVs. Based on the directions of the Chief of Army Staff, a Board of Officers was detailed under Director General of Supplies & Transport (DGST) Lieutenant General Manoj Kumar Singh Yadav as the Presiding Officer to formulate a definite time bound road map for introduction of EVs in Indian Army. The Board of Officers has finalized its recommendations and Lieutenant General Manoj Kumar Singh Yadav briefed the Chief of Army Staff, Army Commanders & Senior Army officers today about the planned introduction of EVs during the Army Commanders meeting. As of now, Indian Army is planning to procure EVs in three categories i.e Cars, Buses and Motorcycles.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1819071>



पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Sat, 23 Apr 2022 2:30 PM

नौसेना प्रमुख का सेशेल्स दौरा

भारतीय नौसेना प्रमुख (सीएनएस) एडमिरल आर हरि कुमार कादक्षिण पश्चिम हिंद महासागर क्षेत्र का दौरा जारी है। इसके तहत उन्होंने 21 से 23 अप्रैल, 2022 तक सेशेल्स का दौरा किया। अपनी इस यात्रा के दौरान उन्होंने सेशेल्स के माननीय राष्ट्रपति महामहिम श्री वैवेल रामकलावन, माननीय विदेश और पर्यटन मंत्री महामहिम श्री सिल्वेस्टर राडेगॉडे और सेशेल्स रक्षा बलों (एसडीएफ) के रक्षा बल के प्रमुख (सीडीएफ) ब्रिगेडियर माइकल रोसेटसे मुलाकात की। इन चर्चाओं में हिंद महासागर क्षेत्र में समुद्री सुरक्षा और द्विपक्षीय रक्षा सहयोग को और अधिक मजबूत करने के उपाय सहित आपसी हित के व्यापक मुद्दों को शामिल किया गया। नौसेना प्रमुख ने पोर्ट विक्टोरिया का नेविगेशन चार्ट प्रस्तुत किया। इसे द्विपक्षीय हाइड्रोग्राफिक (जल सर्वेक्षण संबंधित) सहयोग पर किए गए समझौता ज्ञापन के तहत भारतीय राष्ट्रीय जल सर्वेक्षण कार्यालय (एनएचओ) ने तैयार किया है।

नौसेना प्रमुख ने विभिन्न एसडीएफ इकाइयों का दौरा करने सहित नेतृत्व के साथ बातचीत की। इस दौरान उन्होंने 2001-02 में सेशेल्स सरकार के तत्कालीन नौसेना सलाहकार के रूप में अपने अनुभवों को याद किया। इसके अलावा नौसेना प्रमुख ने समुद्री क्षमताओं के विकास के साथ-साथ प्रगतिशील दृष्टिकोण के लिए एसडीएफ की सराहना भी की। उन्होंने हिंद महासागर में समुद्री सुरक्षा को लेकर सहयोगात्मक दृष्टिकोण के लिए दोनों देशों की ओर से दिए गए महत्व को भी रेखांकित किया। इस संबंध में नौसेना प्रमुख ने गोवा समुद्री सम्मेलन मिलन और हिंद महासागर नौसेना संगोष्ठी (आईओएनएस) में सेशेल्स की सक्रिय भागीदारी की सराहना की। इससे पहले सेशेल्स के सीडीएफ ने फरवरी, 2022 में विशाखापत्तनम में आयोजित मिलन-22 में हिस्सा लिया था।

वहीं, एसडीएफ मुख्यालय में सीडीएफ ने भोजन पर नौसेना प्रमुख की मेजबानी की। इसके अलावा एसडीएफ नेतृत्व ने भारतीय नौसेना के जहाज शारदा पर एक स्वागत समारोह में हिस्सा लिया। इसकी मेजबानी सेशेल्स में भारत के उच्चायुक्त जनरल दलबीर सिंह सुहाग (सेवानिवृत्त) और नौसेना प्रमुख ने संयुक्त रूप से की। तटरक्षक पोत जोरोस्टर कामार्गरक्षण (एस्कॉर्ट) करने के बाद आईएनएस शारदा अभी सेशेल्स में है। जोरोस्टर पोत को 2021 में एक भारतीय शिपयार्ड (जीआरएसई, कोलकाता) से प्राप्त किया गया था। मिलन-22 और गारंटी रीफिट में हिस्सा लेने के लिए भारत में अपनी हालिया तैनाती के बाद सेशेल्स वापस पहुंच गया है। सेशेल्स के सीडीएफ ने भारत में जोरोस्टर की पेशेवर मरम्मत के लिए बहुत आभार व्यक्त

किया और भारतीय नौसेना की उत्कृष्ट सहायता के लिए नौसेना प्रमुख को धन्यवाद दिया। इसके अलावा उन्होंने 14 अप्रैल 2022 को जोरोस्टर के एक चालक दल के सदस्य को चिकित्सा जरूरत के लिए भारतीय नौसेना के हेलीकॉप्टर के माध्यम से तत्काल समुद्र से बाहर निकालने के लिए अपनी कृतज्ञता व्यक्त की। सेशेल्स में सीएनएस की इस बातचीत ने द्विपक्षीय रक्षा कार्यों के स्तर और विस्तार में और अधिक बढ़ोतरी की एक आशाजनक ऊंचाई प्रदान की है। यह प्रधानमंत्री की परिकल्पित सागर (क्षेत्र में सभी के लिए सुरक्षा और विकास) और 'फाइव एस' सोच- सम्मान, संवाद, सहयोग, शांति और समृद्धि के सिद्धांतों पर आधारित है।

<https://pib.gov.in/PressReleasePage.aspx?PRID=1819335>



Press Information Bureau
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Ministry of Defence

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CNS Visit to Seychelles

Continuing with his ongoing tour to the South West Indian Ocean Region, Admiral R Hari Kumar, Chief of Naval Staff (CNS), Indian Navy, visited Seychelles from 21 to 23 Apr 22. During the visit, he called on HE Mr Wavel Ramkalawan, Hon'ble President of the Republic of Seychelles, HE Mr Sylvestre Radegonde, Hon'ble Minister for Foreign Affairs and Tourism and Brigadier Michael Rosette, the Chief of Defence Force (CDF) of the Seychelles Defence Forces (SDF). The discussions covered a wide range of issues of mutual interest including maritime security in the Indian Ocean Region and avenues to further strengthen bilateral defence cooperation. The CNS presented a Navigation Chart of Port Victoria, prepared by the National Hydrographic Office (NHO) of India, under the MoU on bilateral hydrographic cooperation.

During the visits to various SDF units and interactions with the leadership, the CNS reminisced his own experiences as the then Naval Advisor to the Government of Seychelles in 2001-02 and complimented the SDF on the development of maritime capabilities as well as their progressive outlook. He also highlighted the significance accorded by both countries to collaborative approach towards maritime security in the Indian Ocean. In this context, CNS deeply appreciated the active participation of Seychelles in the Goa Maritime Conclave, MILAN and Indian Ocean Naval Symposium (IONS). Earlier, CDF, Seychelles had attended MILAN-22 at Visakhapatnam in February 2022.

While, the CDF hosted the CNS for a luncheon at SDF Headquarters, the SDF leadership attended a reception onboard Indian Naval Ship Sharda, hosted jointly by Gen Dalbir Singh Suhag (Retd), High Commissioner of India to Seychelles and the CNS. INS Sharda is currently in Seychelles after escorting Coast Guard Ship Zoroaster, a vessel sourced from an Indian Shipyard (GRSE, Kolkata) in 2021, back to Seychelles after her recent deployment to India for participation in MILAN-22 and Guarantee Refit. The CDF expressed a very high regard for the

professional refit of Zoroaster in India and thanked the CNS for the excellent support extended by Indian Navy. In addition, he gratefully acknowledged the prompt medical evacuation of a crew member of Zoroaster on 14 Apr 22, from sea by an Indian Navy helicopter.

The interactions of the CNS at Seychelles set in motion a promising trajectory of further growth in the scale and scope of bilateral defence engagements, founded on the principles of SAGAR (Security And Growth for All in the Region) and the 'Five S' Vision of Sammaan (Respect) – Samvaad (Dialogue) – Sahyog (Cooperation) – Shanti (Peace) and Samriddhi (Prosperity) articulated by the Hon'ble Prime Minister of India.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1819259>



पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Sun, 24 Apr 2022 1:44 PM

पूर्वावलोकन: नौसेना कमांडरों का सम्मेलन 22/1

वर्ष 2022 के नौसेना कमांडरों के सम्मेलन का पहला संस्करण 25 से 28 अप्रैल 22 तक निर्धारित है। यह सम्मेलन नौसेना कमांडरों के लिए सैन्य-रणनीतिक स्तर पर महत्वपूर्ण समुद्रिक मामलों पर चर्चा करने के साथ-साथ एक संस्थागत फोरम के माध्यम से वरिष्ठ सरकारी अधिकारियों के साथ बातचीत करने के लिए एक मंच के रूप में कार्य करता है। सम्मेलन के दौरान, रक्षा मंत्री श्री राजनाथ सिंह और विदेश मंत्री श्री एस जयशंकर राष्ट्रीय सुरक्षा से संबंधित मामलों पर नौसेना कमांडरों को संबोधित करेंगे और उनके साथ परस्पर बातचीत करेंगे। भारतीय सेना और भारतीय वायु सेना के प्रमुख तीनों सेनाओं के संयोजन तथा एक सामान्य प्रचालनगत वातावरण तथा इसके साथ-साथ तीनों सेनाओं के समन्वय और तैयारी में वृद्धि करने के तरीकों पर भी नौसेना कमांडरों के साथ चर्चा करेंगे।

अन्य नौसेना कमांडरों के साथ नौसेना प्रमुख पिछले छह महीनों में भारतीय नौसेना द्वारा किए गए प्रमुख प्रचालन, सामग्री, लॉजिस्टिक्स, मानव संसाधन विकास, प्रशिक्षण और प्रशासनिक कार्यकलापों की समीक्षा करेंगे और महत्वपूर्ण गतिविधियों और पहलों के लिए भविष्य की योजनाओं पर विचार-विमर्श करेंगे। इस सम्मेलन में निकटवर्ती क्षेत्रों में सुरक्षा परिदृश्य की पृष्ठभूमि में भू-रणनीतिक स्थिति की गतिशीलता के साथ-साथ वर्तमान में जारी रूस-यूक्रेन युद्ध के कारण उभर रहे परिवर्तनों पर भी विचार किया जाएगा। भारतीय नौसेना भविष्य के लिए तैयार दृष्टिकोण के साथ युद्ध के लिए तैयार, विश्वसनीय और संयोजक बल होने पर ध्यान केंद्रित कर रही है और सुपुर्द किए गए कार्य को लगातार निष्पादित कर रही है। नौसेना ने भारत के बढ़ते समुद्री हितों के अनुरूप पिछले कुछ वर्षों में अपने परिचालन कार्यों में

उल्लेखनीय वृद्धि दर्ज कराई है। 'पसंदीदा सुरक्षा भागीदार' के रूप में भारतीय नौसेना की स्थिति भी हाल के दिनों में समान रूप से बढ़ी है। 2020-21 में, भारतीय नौसेना जहाजों ने आईओआर तटवर्ती देशों को भोजन और चिकित्सा सहायता प्रदान करने के लिए और सागर (क्षेत्र में सभी के लिए सुरक्षा और विकास) के माननीय प्रधानमंत्री के विजन के हिस्से के रूप में कई कोविड संबंधित आउटरीच मिशन शुरू किए हैं।

<https://pib.gov.in/PressReleasePage.aspx?PRID=1819576>



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Ministry of Defence

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Curtain Raiser: Naval Commanders' Conference 22/1

The first edition of Naval Commanders' Conference of 2022 is scheduled from 25 to 28 Apr 22. The Conference serves as a platform for Naval Commanders to discuss important maritime matters at the military-strategic level as well as interact with Senior Government functionaries through an institutionalized forum. During the Conference, Hon'ble Raksha Mantri Shri Rajnath Singh will address and interact with the Naval Commanders on matters pertaining to the national security. The Chiefs of Indian Army and Indian Air Force will also interact with the Naval Commanders to address convergence of the three Services vis-à-vis a common operational environment, as well as discuss avenues of augmenting Tri-Service synergy and readiness.

The Chief of the Naval Staff, along with other Naval Commanders will review major Operational, Materiel, Logistics, Human Resource Development, Training and Administrative activities undertaken by the Indian Navy in the last six months and further deliberate upon future plans for important activities and initiatives. The conference would also dwell upon dynamics of the geostrategic situation in the backdrop of security scenario in the neighbourhood as well as changes emerging due to ongoing Russia-Ukraine conflict.

The Indian Navy is focused on being a combat ready, credible and cohesive force with a future-ready outlook and continues to assiduously execute its mandate. The Navy has witnessed a significant growth in its operational tasking over the years in consonance with India's growing maritime interests. Indian Navy's standing as the 'Preferred Security Partner' has also grown concomitantly in recent times. In 2020-21, IN ships have undertaken multiple COVID related outreach missions to provide food and medical aid to IOR littoral nations and beyond as part of Hon'ble PM's vision of SAGAR (Security And Growth for All in Region).

<https://pib.gov.in/PressReleasePage.aspx?PRID=1819526>

Army, IAF induct advanced Israeli ‘tank killers’ amid LAC standoff

The Army and IAF have now begun to induct advanced Israeli anti-tank guided missiles (ATGMs) with longer ranges and greater armour-penetration capabilities, amid the two-year long military confrontation with China in eastern Ladakh.

The Israeli ‘tank killers’ were ordered under emergency procurements last year due to the troop stand-off with China, which is yet to show any signs of de-escalation. The sheer utility of such weapons has been demonstrated during the ongoing Russia-Ukraine conflict.

Ukrainian troops armed with US-origin Javelin ATGMs and western next-generation light anti-tank light missiles (NLAWS) have destroyed hundreds of Russian tanks and other armoured vehicles since the conflict began on February 24.

The Israeli family of Spike ATGMs is equally lethal and versatile. The Army is inducting the Spike LR-2 launchers and missiles, which have a ground strike range of 5.5-km, while the IAF is integrating its Russian-origin Mi-17 V5 armed helicopters with Spike NLOS (non-line of sight) missiles that can destroy ground targets around 30-km away.

“Both the fifth-generation ATGMs are being inducted in limited numbers under emergency procurements to plug certain operational gaps. The much larger requirement for ATGMs will be met through ‘Make in India’ projects,” a top defence source said on Sunday. “The pilot-controlled NLOS missiles, which can be armed with different kinds of warheads, are primarily meant for specialized ‘behind the hill’ missions by IAF helicopters,” he added.

The IAF, incidentally, has 22 Apache attack helicopters, armed with Stinger air-to-air missiles, Hellfire Longbow air-to-ground missiles, guns and rockets, inducted under the Rs 13,952 crore deal with the US in September 2015. The Army, in turn, is getting six Apaches under a Rs 5,691 crore deal in February 2020.

The Spike LR-2 missiles can be used with either a tandem HEAT (high explosive anti-tank) warhead, with 30% more armour-penetration capability, or a smart multi-purpose warhead. The Army had earlier also inducted a limited number of an earlier generation of Spike tank-killers, with a strike range of 4-km, to meet immediate operational requirements till the indigenous man-portable ATGMs being developed by DRDO were ready.

With a huge deficiency in different kinds of shoulder, vehicle and helicopter-launched ATGMs, the Army has been demanding third and fourth-generation ATGMs for well over a decade.

The force’s existing inventory largely consists of second-generation Milan-2T (2-km range) and Konkurs (4-km) ATGMs, produced by defence PSU Bharat Dynamics under licence from French and Russian companies. The indigenous helicopter-launched third-generation ATGMs, Helina for Army and Dhruvastra for IAF with a maximum strike range of 8-km, have been successfully tested from Dhruv advanced light helicopters but are yet to be inducted till now.

Similarly, DRDO tested the man-portable ATGM, with a 2.5- km strike range, in its “final deliverable configuration” in January this year. But it is still some time away from induction.

<https://timesofindia.indiatimes.com/india/army-iaf-induct-advanced-israeli-tank-killers-amid-lac-standoff/articleshow/91059976.cms>



Sun, 24 Apr 2022

India arming Russian Mi-17 Helicopters with Israeli NLOS Anti-tank Guided Missiles

In a step towards enhancing its firepower against enemy armoured regiments, India is arming its Russian Mi-17 helicopters with the Israeli ‘Non-Line of Sight (NLOS)’ anti-tank guided missiles. The ATGMs can fly low in mountainous areas and can hit ground targets from distances up to 30 kms, top government sources told India Today. According to the sources, the missiles have already arrived in the country and are being deployed on Russian helicopters somewhere in the western sector. The Indian armed forces are implementing the lessons learnt from the Russia-Ukraine conflict where tanks and anti-tank missiles have come into play in a big way. The Ukrainian forces have used the anti-tank and anti-aircraft missiles supplied by the Western European nations and America effectively against the Russian armoured columns, sources said. India is also likely to deploy these armed choppers in the high mountainous terrain in Ladakh and adjoining sectors where the Chinese have positioned a large number of their armoured regiments

<https://www.indiatoday.in/defence/story/india-russian-helicopters-israeli-nlos-anti-tank-guided-missiles-iaf-1941297-2022-04-24>



Fri, 22 Apr 2022

India-UK to jointly design and produce emerging military technologies

India and the United Kingdom will jointly research, design, develop and produce defence technology and systems, "particularly in key and emerging military technologies", as per a decision taken in the meeting between Prime Minister Narendra Modi and his UK counterpart Boris Johnson on Friday.

A joint statement issued by India and the UK said, "They welcomed the finalisation of the Letter of Arrangement between the UK's Defence Science and Technology Laboratory and India's Defence Research and Development Organisation (DRDO), to help deliver advanced security capabilities through joint-research, co-design, co-development and joint production of defence technology and systems - particularly in key and emerging military technologies."

The two leaders welcomed the establishment of a Joint Working Group on India-UK Electric Propulsion Capability Partnership with the goal of fostering military and industrial collaboration in maritime Electric Propulsion systems. The leaders noted the importance of robust defence industrial collaboration for manufacturing of defence equipment, systems, spare parts, components, aggregates and other related products and key capabilities, under the Make-in-India program through codevelopment, indigenisation, transfer of technology and setting up of joint ventures for meeting the needs of the Armed Forces of India and other countries. "They noted cooperation in key areas of strategic collaboration including Modern Fighter Aircraft and Jet Engine Advanced Core Technology," the joint statement said.

Both sides agreed to work bilaterally and with key partner countries to facilitate highest level access to technology to the Indian industry. Modi welcomed the UK announcement of an 'open general export license' to facilitate technology engagement with India, and the open opportunity for India to participate in the UK's aviation and naval shipbuilding programmes. "Prime Minister Modi and Prime Minister Johnson reiterated their commitment to transform defence and security cooperation as a key pillar of the IndiaUK Comprehensive Strategic Partnership and "enhance engagements in support of a free, open and secure Indo Pacific," added the statement.

The two leaders agreed to deepen co-operation, including by quickly resolving legacy issues and intensifying cooperation as trusted partners under the India-UK Defence and International Security Partnership framework. India and UK agreed to expand cooperation in the maritime domain and called for early conclusion of the Maritime Information Exchange Arrangement on dark and grey shipping. They also called for increased engagements on critical and emerging domains of defence including space, Artificial Intelligence (AI) and cyber, the joint statement added. The two Prime Ministers looked forward to the convening this year of the Defence Ministerial Dialogue, which would be an important step to ensure that all the necessary framework agreements are in place. Modi and Johnson reaffirmed their commitment to a free, open, peaceful and secure cyberspace and welcomed the progress under the enhanced India cyber security partnership to "tackle shared cyber threats including to critical national infrastructure." The Joint Cyber Statement by the two countries outlined the commitment of the two countries to deepen cooperation across cyber governance, deterrence and strengthening cyber resilience. Modi and Johnson expressed zero tolerance for terrorism in all its forms and "for all those who encourage, support and finance terrorism or provide sanctuary to terrorists and terror groups" whatever their motivation may be, the Joint statement said. The two leaders called upon all countries to work together to root out terrorist safe havens and infrastructure, disrupt terrorist networks and their financing channels, and halt crossborder movement of terrorists. They reiterated their condemnation of terrorist attacks in India and the UK, including the Mumbai and Pathankot attacks.

"They emphasised the importance of perpetrators of terrorist attacks being systematically and expeditiously brought to justice, and agreed to work together to take concerted action against globally proscribed terrorist entities and individuals," the joint statement said.

The two leaders also agreed to constitute a sub-group, within the Joint Working Group on CounterTerrorism, on countering extremism in order to further enhance cooperation between the two sides in ensuring that all possible actions are taken against groups and individuals based in or operating out of either country, seeking to incite violent extremism and terrorism and who are involved in financing such activities, the joint statement said.

<https://www.uniindia.com/story/India-UK-to-jointly-design-and-produce-emerging-military-technologies>

Business Standard

Sun, 24 Apr 2022

Jaishankar-Argentine foreign minister talks focus on defence, atomic energy

External Affairs Minister S Jaishankar on Sunday held "productive" talks with his visiting Argentine counterpart Santiago Cafiero, focusing on bilateral cooperation in areas like defence and atomic energy. Cafiero is on a visit to India primarily to participate in the three-day Raisina Dialogue, India's premier foreign policy and geo-economics conference. The dialogue begins on Monday. "A productive meeting with FM @SantiagoCafiero of Argentina on his first visit to India," Jaishankar said on Twitter. "Discussed expanding our bilateral trade and cooperating in agriculture, pharmaceuticals, electronics, e-mobility, defence & atomic energy. Will work closely in G20 and multilateral forums," he said.

Separately, the external affairs minister also held talks with Teddy Locsin Jr, the Foreign Affairs Secretary of the Philippines. "Warmly welcomed Secretary Foreign Affairs of Philippines @teddyboylocsin. Appreciated his insights and perspectives on Indo-Pacific, Europe, Myanmar, Ukraine and Multilateralism," Jaishankar tweeted. "Reviewed the progress in bilateral ties since our last meeting in February," he added.

https://www.business-standard.com/article/current-affairs/jaishankar-argentine-foreign-minister-talks-focus-on-defence-atomic-energy-122042400649_1.html



Sat, 23 Apr 2022

Defence start-up AROO collaborates and makes ECWCS for the first time in India for the Indian Army

AROO is India's first defence start-up that creates the Intellectual Property in specialized defence clothing. AROO was started by Rohit Bedi and Munish Hinduja, in the defence space for apparel and gear, and through its OEM manufacturers the ECWCS (Extreme Cold Weather Clothing System) and other specialized defence clothing. AROO's business approach is unique as it creates the products and applications for a specialized category of clothing and gear and

then partners with the most capable OEM (original equipment manufacturer) to supply the product to the Armed forces.

AROO's first product was ECWCS where they passed field trials in 2017 and are currently manufacturing this product in India through its OEM based out of Bengaluru. ECWCS is a 3-layer modular clothing system worn together, which is designed to operate in temperatures of up to -50 degrees Celsius. This product is used by our Indian soldiers at high altitude regions including the Siachin Glacier which is the highest battlefield in the world. This clothing system was being imported for over 25 years. We can with pride comment that AROO ECWCS outperforms the imported clothing systems provided to the Indian Army. It is also at a lower cost thus providing savings to the Indian government. Furthermore, the Indian Army is no longer dependent on foreign companies for this life-saving apparel. AROO is also in advanced field trials with the Indian Army for the new Trouser ECC (extreme cold clothing) which operates in temperatures up to -30 degrees Celsius.

Rohit Bedi, Co-founder AROO says, "We were inspired by the government's policies of "Make in India". Our vision started with the Indian government's focus to promote the indigenization of key imported products to decrease the dependencies on imports. Our mission is to provide world-class protection solutions for our 'JAWANS,' and our ambition is to exceed any world manufacturer in terms of product, quality and pricing. With the government's initiative and thrust of encouraging Indian defence manufacturing, AROO realized the potential in this segment because a large portion of the special clothing and mountain equipment (SCME) was being imported into the country"

Munish Hinduja, Co-founder AROO says, "The manufacturing process designed by AROO is focused on creating a defect-free product. The manufacturing lines at our OEM's facility combined with our quality standards and rigorous raw material testing conducted at our OEM's in-house testing facility, provide us with real-time product performance, with an eye on the CLO value (warmth level) and waterproofness of the garment our production supply outperform foreign specifications by 20% to 75% on key performance parameters" "AROO creates high-performance military-grade textiles with a functional design sensibility that provides comfort, performance, and protection to the end-user. The product's complexity requires a high level of technical ability in sewing and apparel construction. Our OEM for ECWCS has specialized infrastructure for seam sealing, sewing, and testing at both the textile and garment manufacturer levels".

<https://www.apnnews.com/defence-start-up-aroo-collaborates-and-makes-ecwcs-for-the-first-time-in-india-for-the-indian-army/>

NASA to roll back its SLS Rocket for repairs

NASA is reportedly preparing to rehouse its Space Launch System (SLS) rocket after three failed attempts to complete wet dress rehearsal testing, according to Space.com. The rocket will now be rolled off Launchpad 39B at Kennedy Space Center in Florida and returned to its assembly building, the cavernous Vehicle Assembly Building (VAB). The SLS is a super-heavy non-reusable launch vehicle that NASA is currently scheduled for a June 2022 launch as part of the Artemis program whose primary aim is to return humans to the moon for the first time since 1972. Once completed and successfully tested, it would be the most powerful rocket ever built by NASA. Even though SLS is scheduled for a June 2022 launch, that is dependent on it completing a wet dress rehearsal, which hasn't managed to. The wet dress rehearsal consists of a series of key trials designed to show that Artemis 1's SLS rocket, Orion spacecraft and their associated ground infrastructure are ready to go.

It began on April 1 and was supposed to wrap up 48 hours later, after the loading of liquid hydrogen and liquid oxygen propellants into the rocket and some simulated launch countdowns. But the team ran into many problems, and after abortive tries on April 3 and 4, eventually had to stand down to accommodate a private astronaut mission which was scheduled to be launched on April 8 from the same launchpad. The rehearsal continued again on April 12 in a modified format after the team discovered a faulty valve on the mobile launch tower supporting the rocket and the stack but the team had to stop it once again after they noticed liquid hydrogen leaking from one of the lines running from the mobile launch tower to the SLS.

Initially, the team had planned on resuming the wet dress rehearsal around April 21 but NASA instead decided to roll the rocket back to the VAB to replace the faulty valve and assess the readiness of the rocket and associated system. "While most objectives associated with the wet dress rehearsal were met during recent testing, teams plan to return to the launch pad when repairs and checkouts in the VAB are complete for the next full wet dress test attempt," said an announcement by the agency. NASA did not yet provide any tentative dates for the next test.

<https://indianexpress.com/article/technology/science/nasa-will-roll-sls-back-to-storage-could-potentially-delay-artemis-1-mission-7885119/>



Fri, 22 Apr 2022

Green fuel-powered satellite engine made by Indian start-up 'Manastu' to reach orbit by early 2023

From building IIT Bombay's maiden student satellite 'Pratham', to working on developing a safer fuel and more efficient engine for satellites, the founders of Indian start-up 'Manastu' have come a long way.

On the occasion of their venture's fifth anniversary, Tushar and Ashtesh, the duo behind Manastu threw light onto their interesting offerings and the company's future projects. Notably, the Indian start-up hopes to fly their newly-developed system to space by early 2023 and also have their technology commercialised.

After being placed in orbit by rockets, satellites have to rely on their on-board fuel and engines to make maneuvers, in order to avoid colliding with space debris and to remain in their precise orbits, while functioning in the harsh environments of space. While this task has been handled for several decades by engines powered by fuels such as Mono methyl hydrazine, such fuels are toxic, highly volatile and cancer-causing, thus raising several concerns over their safety.

According to Ashtesh, who serves as the CTO at Manastu, they have developed a new propulsion technology for satellites and it will be powered by 'MS-289' which is a proprietary blend of Hydrogen peroxide and additives. In order to initiate the combustion of this novel fuel, the company will be using a chemical catalyst, that performs the similar function of a sparkplug in an automobile. About this technology, the company says "Fuel is as safe as common salt, hence less safety precautions and less infrastructure cost, Agile System due to ability to produce higher thrust compared to Electric Propulsion, 50 per cent Higher Performance due to higher combustion temperature and higher density of our fuel and engine design".

Three variants of this propulsion system have been built- to meet the requirements of satellites of different sizes (weighing over 100kg, small cube satellites etc. In addition to this, as part of their future endeavours they aim to develop satellite refuelling systems that can help extend the life of in orbit satellites.

Similar to an aerial-refuelling tanker that can extend the range of aircraft, this concept hopes to create a mechanism where a tanker(carrying satellite-grade) fuel can dock with a satellite and fill its tank, to extend its life. At the end of the satellite's operational life, similar tankers would also be used to de-orbit the satellite, thus preventing it from becoming space debris and a threat to other orbital assets.

By September this year, five-year-old company is optimistic about conducting a final test that involves putting the satellites through the rigours of space-like conditions(thermovac test), at a test facility. Once this test is complete, the team hopes to launch their satellite to space in early 2023 and prove its practical worthiness and capabilities, following which they can commercialise the technology.

According to team Manastu, India's state-run Defence Research Development Organisation (DRDO) has signed up to have this technology onboard an Indian strategic satellite, whereas a French company is also in talks to utilise this system in the final stage of their rocket, for orbit correction and maneuvers.

<https://www.wionews.com/india-news/green-fuel-powered-satellite-engine-made-by-indian-start-up-manastu-to-reach-orbit-by-early-2023-473025>

