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Meet UXOR, A DRDO robot which defuses bombs up to 1,000 Kg

Defence Research and Development Organisation (DRDO) has developed a robot which can defuse bombs up to 1,000 kg. The name of the robot is Unexploded Ordnance Handling Robot (UXOR) and it has been developed to deal with Unexploded bombs.

The Indian Air Force will soon procure these robots. The need of this robot was felt during Balakot strike. After Balakot strike, Pakistan retaliated and targeted Indian Army installations. Pakistani Air Force dropped bombs which remained unexploded.

After the several trials, Indian Air Force is now in the process of acquiring these robots. This robot removes the need of humans to defuse bombs and it is monitored from a mobile centre.



DRDO scientist Alok Mukherjee said, “These robots are controlled remotely from a distance of 2 km. The operator can locate and defuse the explosive by using high pressure water jets.” Alok Mukherjee has been part of the developing team of this Unexploded Ordnance Handling Robot (UXOR).

During the ongoing Defence expo in Lucknow, DRDO displayed this indigenously designed robot. <https://indiandefencenews.info/meet-uxor-a-drdo-robot-which-defuses-bombs-up-to-1000-kg/>

India’s Defense ministry, HAL conclude price negotiations for 83 MK1A light combat aircraft

The estimated price tag for the 83 light combat aircraft is \$5.45 billion

By Franz-Stefan Gady

India’s Ministry of Defense (MoD) and state-owned Hindustan Aeronautics Limited (HAL) have reportedly concluded negotiations to procure 83 indigenously designed and developed Tejas Light combat Aircraft (LCA) Mark (Mk) IA for the Indian Air Force (IAF) for \$5.45 billion (390 billion or 39,000 crore Indian rupees), according to local media reports.

“With the contract price now settled at Rs 39,000 crore, the procurement file is being sent to the Cabinet Committee on Security for final nod. It should be cleared before this fiscal ends on March 31. Once the contract is inked, HAL promises to begin deliveries of the Mark-IA jets in three years,” a source familiar with the matter was quoted as saying by the *Economic Times* on February 17.

The Indian MoD placed an order for 40 Tejas LCA Mk I with HAL, including eight tandem two-seat LCA trainer aircraft, divided into two batches of 20 aircraft each in 2006 and 2010 respectively.

To date, the IAF has taken delivery of 17 Tejas LCA in initial operational configuration or capability (IOC), which means the fighter jet meets the minimum requirements for operational deployment by the IAF.

The Tejas LCAs are operated by No 45 Squadron (Flying Daggers) at Sulur in southern India. The squadron is expected to receive three more Mk I aircraft in the summer months of 2020. The remaining 20 Mk Is are scheduled for delivery by 2022 in final operational clearance (FOC) configuration. The Tejas Mark I LCA was awarded FOC status by the Indian Aeronautical Development Agency (ADA) in February 2019.

As I reported elsewhere, according to the IAF, the Tejas Mk I variant does not meet the service's specifications and operational requirements:

“The IAF has listed several technical deficiencies found on the Tejas LCA Mark-I variant in 2017. These flaws will purportedly will be addressed in later variants of the aircraft, which will include 43 improvements over the existing version.

Upgrades will include an advanced active electronically scanned array (AESA) radar system, a new electronic warfare sensor suite, and a new externally refueling capability.”

HAL and Israel Aerospace Industries (IAI) subsidiary Elta Systems signed a contract for the purchase of 83 ELM-2052 active electronically scanned array (AESA) radars and ELL-8222WB electronic warfare (EW) suites to be integrated with the Mark-IA in October 2018.

The Mk IA variant, powered by a General Electric F404-GE-IN20 turbofan engine, will be around 1,000 kg lighter than the Mk I. The newer variant will purportedly also have less maintenance requirements.

The IAF plans to induct a total of 123 Tejas Mark IA aircraft, next to the 40 first-generation Mark-Is. The IAF's current combat strength is around 28 squadrons.

<https://thediplomat.com/2020/02/indias-defense-ministry-hal-conclude-price-negotiations-for-83-mk1a-light-combat-aircraft/>

THE TIMES OF INDIA

Thu, 20 Feb 2020

Seized Chinese ship isn't just a cargo vessel: Sources

Rajkot: 'Da Cui Yun', the Chinese ship which was seized by the customs department a few days ago based on intel reports, has been found to be more than just a cargo vessel. According to sources, the ship which was found to be carrying suspected equipment used in missile manufacturing had visited Deendayal port nearly 15 times in last one year to discharge consignments here and thereafter leave for Karachi to deliver cargo. In all earlier shipments, the vessel had declared the same cargo as 'machinery'.

According to sources the vessel belonging to Hong Kong flag of China Ocean Shipping company limited (COSCO) visited Deendayal port at least twice in a month in the past one year. It carried windmill tower as its deck cargo, while it declared the under-deck cargo as machinery or project cargo. After unloading the windmill tower at Kandla, the vessel left for Karachi.

The sources further said that in the last one and half years, a few other multi-port vessels too have gone to the UAE, Gulf and Bahrain after unloading cargo at Kandla. “The loading port — Jiangyin port in China — has always always remained the same for the earlier ships, while the destination of most of the ships was Qasim,” the sources said.

The Defence Research and Development organization (DRDO) which is probing the seized cargo is also investigating into how many times the ship had been carrying such type of cargo.

According to sources the suspected cargo is discharged and taken to a warehouse of Deendayal port. After this, the vessel is released from berth and shifted to outer tuna buoy (OTB). The DRDO is investigating inside the warehouse.

Da Cui Yun started its journey from Jiangyin port in China in January. Around 10 days ago customs department seized the vessel suspecting it to be carrying equipment that is used in missile manufacturing which was meant for unloading at Karachi. The custom officials are tight-lipped on the investigation so far, terming it an issue of national security.

<https://timesofindia.indiatimes.com/city/rajkot/seized-chinese-ship-isnt-just-a-cargo-vessel-sources/articleshow/74216444.cms>



Thu, 20 Feb 2020

Navy to get 24 US-made copters for Rs 18,200 crore

New Delhi: Ahead of US President Donald Trump's visit, the Cabinet Committee on Security (CCS), headed by Prime Minister Narendra Modi, on Wednesday cleared the deal to acquire 24 MH-60R Multi-Role Helicopters for the Navy.

India is looking to get 24 specialised marine helicopters from US company Lockheed Martin for \$2.6 billion (Rs 18,200 crore). The price negotiation has ended and a final contract is expected anytime now. The acquisition will help the Navy in its role of dominating the Indian Ocean.



The MH-60R is also used by the US Navy. It will have full anti-submarine warfare (ASW) capability, as well ability to engage in warfare with ships at sea. The helicopters would replace India's ageing fleet of British-made Sea King helicopters which are more than 40 years old. An ASW-capable helicopter which carries sea-dunking with its sea-dunking sonars are a favoured platform for detecting a submarine. Submarines of the People Liberation Army Navy of China have been spotted in the Indian Ocean often.

Lockheed Martin website says the MH-60R is the most reliable and cost effective option in its class. The helicopter has the lowest life-cycle cost in its class, says the company website.

MH-60R to have anti-sub capability

- The MH-60R will have full anti-submarine warfare capability, as well ability to engage in warfare with ships at sea. The helicopters would replace India's ageing fleet of British-made Sea King helicopters which are more than 40 years old
- Lockheed Martin website says it is the most reliable and cost effective option in its class. Its availability is 98 per cent and has an operating cost of less than \$5,000 per flight hour

<https://www.tribuneindia.com/news/navy-to-get-24-us-made-copters-for-rs-18-200-crore-44187>

Trump in India: \$2 billion helicopter deal cleared; missile shield LoA received

The choppers enable warships to locate and take down enemy submarines beyond the limited radius of onboard sensors. The absence of these aircraft had limited the Navy's ability to hunt submarines in the Indian Ocean Region - a big gap in a vital region given the increasing presence of Chinese submarines operating under the garb of antipiracy patrols

By Manu Pubby

New Delhi: In the run-up to President Donald Trump's visit, India has cleared a \$2-billion deal to acquire naval multirole helicopters while the US has moved ahead on its offer for a missile shield system to protect the national capital. The deal for 24 advanced MH 60 'Romeo' choppers from the US in a direct government purchase has been a priority for the Navy, given that some of its newer ships don't have a capable integral chopper. Sources said that the contract would be inked around the visit.

The choppers enable warships to locate and take down enemy submarines beyond the limited radius of onboard sensors. The absence of these aircraft had limited the Navy's ability to hunt submarines in the Indian Ocean Region - a big gap in a vital region given the increasing presence of Chinese submarines operating under the garb of antipiracy patrols. T

The Navy requires at least 123 of the Naval Multi Role Helicopters (NMRH) and had released a global request for information in August 2017 but the case has not progressed as fast as the Navy would have liked.

Progress has also been made on the sale of the National Advanced Surface-to-Air Missile System (NASAMS) to India under a Foreign Military Sales pact. The system is designed to protect the national capital from all incoming air threats and was notified to the US Congress for a possible sale to India, valued at \$1.8 billion.

"The LOA has been issued from the US side and we have reached a fairly advanced stage in the consultations for an advanced missile defence system for the protection of the national capital region," government sources said.

<https://economictimes.indiatimes.com/news/defence/trump-in-india-2-bn-copter-deal-cleared-missile-shield-loa-received/articleshow/74217986.cms>



Border guards prepare action plan to reduce threat along frontiers

By Rakesh K Singh

New Delhi: Following the visit of Union Home Minister Amit Shah to the headquarters of various paramilitary forces, the border guarding forces are working on a proposal to conduct vulnerability mapping of the respective borders under their area of responsibility and prepare an action plan to reduce threat along the frontiers in the next five years.

As an outcome of Shah's visit, vital installations in the border areas are proposed to be brought under the coverage of anti-drone technology.

The proposal for revamping the border security will also incorporate quality and number of manpower, technical requirements and budgetary provisions needed to securing the frontiers and reducing vulnerabilities.

The Ministry has also invited suggestions for recruiting 50 per cent of the personnel in the border guarding forces from the States along the borders.

The border guarding forces have also been advised to identify groups of young officers who will cover the frontiers on motor bikes and identify loopholes in the security paraphernalia along the frontiers.

The plan to strengthen the borders also includes a proposal to train jawans in the languages spoken by people across the borders. A training scheme is proposed to train the jawans in such languages.

The forces have also been asked to identify vacant land in the bordering areas to settle former paramilitary forces' personnel to check migration of population from such areas. The forces have also been asked to seek suggestions from the jawans to check migration of population from bordering areas.

Officials said there is also a proposal to formulate a mechanism for reporting by the border guarding forces with their respective headquarters for holding institutional meeting by the forces with the district/state administration in the border areas.

The border guarding forces have been asked to tie up with the Border Security Force (BSF) to install Comprehensive Integrated Border Management System (CIBMS) on a trial basis along the frontiers with Nepal, Bhutan and Myanmar.

Two pilot projects covering about 71 km on India-Pakistan Border (10 km) and India-Bangladesh Border (61 km) of CIBMS last year. The next phases of CIBMS seek to cover about 1,955 km of the border which cannot be physically fenced. The CIBMS project will vastly improve the capability of BSF in detecting and controlling the cross border crimes like illegal infiltration, smuggling of contraband goods, human trafficking BESIDES and cross border terrorism smart fencing comprising an array of technological gadgets.

While the BSF guards the Indo-Pakistan and Indo-Bangladesh borders, the Indo-Tibetan Border Police (ITBP) secures the frontier along China. The Sashastra Seema Bal (SSB) guards the frontiers along Bhutan and Nepal.

<https://www.dailypioneer.com/2020/india/border-guards-prepare-action-plan-to-reduce-threat-along-frontiers.html>

Modi-Trump meet & India's air defence: How cutting edge NASAMS II tech bolsters New Delhi's security apparatus

The NASAMS -II, developed by Kongsberg Defence & Aerospace and Raytheon, is already in use in Washington and operational across 11 other countries including Spain, Turkey, Poland and Greece

By Shiv Nalapat

Key Highlights

- *The NASAMS-II, developed by Norwegian defence developer Kongsberg Defence & Aerospace, in collaboration with Raytheon, is primarily used to effectively guard against aerial threats in the form of fighter aircraft, helicopters, unmanned aerial vehicles, and missiles*
- *Developed using a modular design, the NASAMS allows operators to tailor the weapon's configuration to suit specific mission parameters*

Despite latest reports that the upcoming meeting between Prime Minister Narendra Modi and US President Donald Trump is unlikely see the inking of any noteworthy bilateral trade agreements, the US president's visit may still prove fruitful in helping Washington and New Delhi come to an agreement on India's purchase of an Integrated Defence Weapon System (IADWS) in a deal that could be worth \$1.86 billion.

In June 2019, it was reported that India was looking to acquire the highly regarded National Advanced Surface to Air Missile System-II (NASAMS-II) from the United States, as it looks to bolster its security apparatus in the National Capital Region. India had submitted a formal 'letter of request' to purchase the air defence system in July 2018.

The NASAMS-II, developed by Norwegian defence developer Kongsberg Defence & Aerospace, in collaboration with Raytheon, is primarily used to effectively guard against aerial threats in the form of fighter aircraft, helicopters, unmanned aerial vehicles, and missiles.

The air defence system employs “network-centric, open architecture” that improves its survivability against electronic jamming techniques. Its base weapon is the AIM-120 Advanced Medium-Range Air-to-Air Missile (AMRAAM). The defence system employs AMRAAM missile launchers, electro-optic and infra-red sensors, a real-time communication network, and a mission planning platform.

The NASAMS-II can be fitted with multiple missile launchers, each capable of launching a maximum of six surface-to-air missiles. Equipped with 360-degree defence capabilities, the system can be used in both day and night operations and transported via rail or truck. The mobile missile launchers can be activated remotely via a Fire Distribution Center (FDC) located up to 25 km away. In total, up to 12 launchers can be installed, firing 72 missiles against 72 separate targets.

The NASAMS was first deployed in Washington DC in 2005 but is designed for operations in sub-tropic, arctic and desert conditions as well. One of the key features of the NASAMS system is its flexible configurations. Developed using a modular design, the NASAMS allows operators to tailor the weapon's configuration to suit specific mission parameters.

The system is already used by 11 nations, including several NATO and EU countries. It is currently employed by Spain, USA, Chile, Norway, the Netherlands, Poland, Greece, Sweden, Turkey and Finland, with other countries like Oman, Qatar, Lithuania, Australia and Indonesia awaiting completion of production for their own systems.

(The views expressed by the author are personal and do not in any way represent those of Times Network.)

<https://www.timesnownews.com/india/article/air-defence-on-agenda-during-modi-trump-meet-how-the-cutting-edge-nasams-ii-will-modernise-the-ncrs-security/555348>



Thu, 20 Feb 2020

The missing piece in India's defence jigsaw puzzle

The country needs a clearly articulated white paper on its defence needs which sets out its strategic concerns

By M.K. Narayanan

Undoubtedly, we are living through a moment of decisive change and turbulence. This geopolitical period is perhaps the most troubled since the final decades of the 20th century. Hence, there exists a vital need to adopt right strategic choices. According to 2018 data, India occupies the fourth place in military expenditure across the world, behind the U.S., China, and Saudi Arabia. This does not mean that India has no further need to increase its stock of state-of-the-art weapons. What is needed, nevertheless, is sober reflection and a cost-benefit analysis, to ensure that the amounts expended are in tune with our strategic requirements.

Defence deals in the pipeline

This is an opportune moment to undertake such a cost-benefit analysis. The first lot of Rafale fighter jets are expected shortly. The final deal on the 200 Kamov Ka-226 light utility helicopters from Russia is in advanced stages and expected to be signed soon. In October 2018, India and Russia had signed a \$5.4-billion mega deal for the S-400 Triumf Air Defence System. Under contemplation today are yet another set of high-value U.S. defence deals, including additional purchases of P-8I Maritime Reconnaissance Aircraft and Apache Attack Helicopters. According to estimates, the total worth of defence equipment purchased from the U.S. alone since 2007 is in the region of \$17-billion.

On the eve of U.S. President Donald Trump's visit to India, a further spurt in defence purchases is anticipated. Speculation is rife that India and the U.S. would sign a deal for the National Advanced Surface to Air Missile System (NASAMS-II), intended as part of a multi-layered missile shield to protect Delhi. The U.S. side is also hoping for two more mega defence deals, worth \$3.5-billion to be signed for 24 MH-60 Romeo Multi Mission Helicopters for the Navy and an additional six AH-64E Apache Attack Helicopters for the Army. (India's Cabinet Committee on Security, on Wednesday, cleared the MH-60 helicopter deal.)



Given India's rising global profile, and with two major adversaries on its borders, India needs to be fully prepared. What is lacking in the defence jigsaw puzzle, however, is a well considered and clearly articulated white paper on India's defence needs, that sets out its strategic concerns, how it is positioning itself to meet these challenges, and the putative costs of meeting the country's defence needs.

Pakistan, China threats

Several nations undertake such exercises. In India, exercises of this kind are sometimes undertaken, but they suffer from a lack of clarity and are restricted in scope. They contain vague references to the threat posed by China and Pakistan, but there is clearly more to India's defence needs than exercises in

military hagiography. What is required is a well formulated defence white paper, putting the different threats and dangers the nation faces in perspective, alongside steps taken to meet these challenges.

In the case of Pakistan, the threat motif is, no doubt, obvious. India's political and defence establishment are on record that India can easily defeat Pakistan, even if a "weaker" Pakistan possesses "nuclear teeth". Yet, while this makes for excellent copy, a great deal of effort is called for to explain to the public, the true nature of the threat posed by Pakistan, and why India is so confident of beating back the Pakistani challenge.

Meeting the military, strategic and economic challenge from China is an entirely different matter. China is not Pakistan, and while China and Pakistan may have established an axis to keep India in check, explaining the nature of the threat posed by China to India is a complex task that needs to be undertaken with care and caution.

Understanding Beijing

To begin with, there are many experts who express doubts as to whether China intends today to pursue its 19th Century agenda, or revert to its belief in 'Tian Xia'. Undoubtedly under China's President Xi Jinping, China aims to be a great power and an assertive one at that. India's defence planners should, however, carefully assess whether there are degrees of "assertiveness" in China's behavioural patterns. There is little doubt that regarding its claim to areas falling within the 'nine-dash lines' (the first island chain), China is unwilling to make compromises. Whether this applies to other regions of Asia and the Indo-Pacific, calls for an in-depth study. It would be premature for India without undertaking such an analysis, to adhere to a common perception that China is intent on enforcing a Sino-centric world order in which India and other countries would necessarily have to play a secondary role.

If after undertaking such an "analysis", it appears that China does not pose a direct threat to India's existence, notwithstanding the fact that India is its main rival in Asia, then India's political, strategic and military planners need to come up with a different set of alternatives. In recent years, unfortunately, much of India's strategic thinking regarding China's aggressive behaviour has been coloured by that of the U.S. and the West, though it is a proven fact that China has not used lethal military force abroad since the 1980s.

China's Belt and Road Initiative (BRI) does convey an impression that China seeks to put itself at the centre of the world. The speed with which many of the steps to progress the BRI are being taken, again conveys an impression that China is intent on shrinking the physical and psychological distance between Europe and East Asia. This does not, however, necessarily mean that China is preparing to confront individual countries in Asia, such as India, which do not subscribe to the BRI.

A defence white paper would provide a more definitive answer to such issues. A detailed exercise to assess whether China is indeed a threat, rather than a challenge, to India should prove invaluable. It is possible that a detailed study may indicate that China understands that there are limits to its strength and capabilities. Several instances of late, have shown the frailties in China's policies — Hong Kong, Taiwan, and even Xinjiang are instances that indicate that China has its own Achilles heel. Consequently, China may not be ready, for quite some time at least, to seek a direct confrontation with India.

A closer look at Beijing's policies, undertaken as part of a defence white paper, may also indicate that rather than a "conflict-prone" role, China is more intent on an "influence-peddling" one. This is important from India's point of view. Already there is one school of thought that believes that Beijing is better at converting its economic heft into strategic influence, rather than employing force beyond certain prescribed areas.

If this view is espoused by a defence white paper then, despite the vexed border dispute between India and China, the two countries could try and arrive at a subliminal understanding about respective spheres of influence. Today, one of India's major concerns is that China is attempting to intrude into

its sphere of influence in South Asia, and the first and second concentric circles of India's interest areas, such as Afghanistan and parts of West Asia. The defence white paper might well provide a strategic paradigm, in which India and China agree to peacefully co-exist in many areas, leaving aside conflict zones of critical importance to either, thus ensuring a more durable peace between them.

One other outcome that the defence white paper could attempt is: whether China views geo-economics as the primary arena of competition today. China has invested heavily in artificial intelligence, robotics and bio-technology, and perhaps, India needs to recognise that rather than blacklisting Chinese technology Tech firms, (which could prove counter-productive) there exist avenues for cooperation, paving the way for better state-to-state relations.

A focus on domestic politics

A final word. The defence white paper needs to underscore that a country's domestic politics are an important pointer to a stable foreign policy. There could be different schools of thoughts within a nation, but equilibrium needs to be maintained if it is not to adversely impact a nation's foreign policy imperatives. An impression that the country is facing internal strains could encourage an adversary, to exploit our weaknesses. This is a critical point that the defence white paper needs to lay stress on.

(M.K. Narayanan is a former National Security Adviser and a former Governor of West Bengal)

<https://www.thehindu.com/opinion/lead/the-missing-piece-in-indias-defence-jigsaw-puzzle/article30863880.ece>



Thu, 20 Feb 2020

Women deserve a bigger role in armed forces

Women encourage participation and share power and information as they have learnt this since their childhood, and yet are ruthless when the situation demands. It comes naturally to them to enhance the self-worth of their colleagues and get the best out of them, a rare but much sought-after quality in a good leader. Our armed forces are opening the doors to women very hesitantly. Their role must be made more broad-based

By Col DS Cheema (Retd) Military commentator

Combat role in the Indian Army has for long been an exclusive domain of men. India will be among the few countries globally to have broken the gender barrier. Women have been serving in administrative and technical roles in various corps, but combat role for them, initially in the Military Police, is a new beginning. The recent Supreme Court judgment has finally accepted gender parity in the Army by allowing women officers in command positions.

The debate on women in combat role in the armed forces comes up at regular intervals, although women have been in such roles in other countries earlier too. History bears testimony to the fact that thousands of women from Britain, Germany and America, excluding the women guerrilla fighters and those who took part in uprisings against the rulers, who may not be included in the strict definition of a combat soldier, fought during the Second World War. By 1943, the army of the Soviet Union had enrolled more than a million fighting women. The 586th Fighter Aviation Regiment, 587th Bomber Aviation Regiment and the 588th Night Bomber Regiment of the Soviet Air Force were all-female units of pilots and aircraft engineers.

In the Indian context, who can forget the fighting spirit of the women warriors of Guru Gobind Singh and the inspiring legend of Rani of Jhansi? It is believed that Subhas Chandra Bose had read an article by an Englishman, who wrote after the first war of independence in 1857, "If there had been a thousand women like the Rani, we could never have conquered India." According to the late Captain

Lakshmi Sahgal, who was the Commander of the Rani Jhansi Regiment (RJR), Netaji chose this name for the regiment of the corps of female combat soldiers after reading that article. Each of the RJR soldiers of the Indian National Army (INA), roughly 5,000 in number, is a case history of grit and determination of women in combat role.

Historian Vera Hildebrand writes in her book, *Women at War* (2016), “The RJR, the first all-female infantry fighting unit in military history, was created in Singapore in July 1943 by Indian nationalist Subhas Chandra Bose to liberate India from British colonial oppression.” These women soldiers were trained for deployment in the hostile terrain of steamy jungles of Burma, a challenging assignment for any soldier, during the last two years of World War II. It is a different matter that they could not actually face the enemy. Recently, the first batch of three women fighter pilots of the IAF has created a history of sorts.

It has taken many years to come to a stage that women are now being even considered for combat role in the armed forces. It is unfortunate that in 2020, there are some old hats, mostly retired generals, who still feel that women must remain the ‘weaker’ sex in the forces. Their arguments display the traditional bias against women and point towards the well-known facts about the men having different pulse rate and bigger biceps and their ability to shout much louder. They list many pitfalls of the idea, cleverly ducking some natural strength in a woman’s DNA.

The entire thought process smells of continued decay in attitude towards them. Women who are more likely to adhere to the ‘rules of conduct’ have broken the glass ceiling in many fields earlier unheard of and yet are required to prove their suitability for a bigger role in the armed forces. They are succeeding because of — not in spite of — certain traits generally considered ‘feminine’. Time and again, they have demonstrated their physical, psychological and moral strengths in different situations.

If we examine the qualities required for a good professional soldier and relate them with men and women to find out whether they fare equal or not on that yardstick, women will, perhaps, fare a shade better. Professional competence which admittedly requires a certain level of physical fitness is the most important factor.

A professional soldier should be a person who takes on the responsibility for fellow soldiers by sharing and caring for them, can lead in the face of chaos and danger when a situation arises and must have moral and mental toughness in such situations, should be an expert in the use of weapon systems and equipment, must remain committed to the defence of the nation and be bound by a strong ethical framework.

Women encourage participation and share power and information as they have learnt this since their childhood, and yet are ruthless when the situation demands. It comes naturally to them to enhance the self-worth of their colleagues and get the best out of them, a rare but much sought-after quality in a good leader. Our armed forces are opening the doors to women very hesitantly. However, a stage has come when their role must be made more broad-based.

Many developed countries have women as fighter pilots, they command ships and serve in all arms and services. The US has taken the lead in this direction. The most important argument of those who speak against women in combat role is women becoming prisoners of war and suffering rape at the hands of enemy soldiers.

There are international laws governing the conduct of armed conflicts. Is it fair to deny equal job opportunities to 50 per cent of the population of the country? Empowerment and autonomy of women and improvement in their political, social, economic and health status are important ends in themselves. For sustainable development, these are also essential objectives.

Women have already created a niche for themselves as fighter pilots in the IAF and as administrators in supporting services. There is a definite need to enlarge their role by letting them engage in combat roles as well. It is a good idea whose time has come.

<https://www.tribuneindia.com/news/women-deserve-a-bigger-role-in-armed-forces-44236>

ISRO to 'split up & unite' a satellite in space this year

By Chethan Kumar

Bengaluru: Among things in ISRO'S pipeline this year, the space agency will be splitting up a satellite and then re-uniting it in space. This Space Docking Experiment (SPADEX) will be key in realising technologies for future human missions and the proposed space station.

While the technology Isro is aiming to eventually have is one that will allow it to transfer humans from one vehicle or spacecraft to another, the immediate goal is to enable refuelling of spacecraft to give them a longer life and also transfer other crucial systems to an existing spacecraft, by transporting another to space.

Confirming this to TOI, ISRO Chairman K Sivan, said: "The satellite we will launch will have two components. It will be separated into two pieces and then they will get docked into a single piece. This single unit will then function as a full-fledged satellite. This is a very crucial technology."

A successful SPADEX experiment will also give ISRO data on space rendezvous technology — capabilities wherein two spacecraft can find each other and remain in the same orbit — advancements in which are critical if India wants to have its own space station built in the future.

"The space station is a long-term project. We are working on it, but the immediate focus is on big missions like Chandrayaan-3, Aditya-L1, Gaganyaan, and other satellite launches," Sivan said. The SPADEX project has so far received Rs 10 crore, but ISRO will need more money in the future.

The challenges of the experiment would be that docking has to be automatic and many of the functions thereon will have to be robotic. There is also the challenge of managing the speeds of each of the crafts (or two units in this case) when they near each other and to then dock one vehicle in a manner that it doesn't crash or collide into each other.

The Vikram Sarabhai Space Centre (VSSC) is working on rendezvous and docking. "To achieve docking during the final phase of the mission, the relative position and velocity of the target spacecraft and chaser spacecraft has to be brought to zero. To ensure proper alignment of the docking port, the relative angular orientation needs to be precisely aligned," an ISRO document reads.

This technology will be a forerunner to future planetary missions including crew transfer, international participation et al, the document added.

"The satellite will be ready by mid-year but then we have a lot of tests to be done. The experimental launch may happen towards the end of this year," Sivan added.

ISRO has already worked on several systems like signal analysis equipment, high-precision videometer for navigation, docking system electronics and real-time decision making for landing systems, all of which will be used in this experimental flight.

<https://timesofindia.indiatimes.com/india/isro-to-split-up-unite-a-satellite-in-space-this-year/articleshow/74201580.cms>