

# समाचार पत्रों से चयित अंश Newspapers Clippings

दैनिक सामयिक अभिज्ञता सेवा  
A Daily Current Awareness Service

Vol. 44 No. 95 16 May 2019



रक्षा विज्ञान पुस्तकालय  
Defence Science Library  
रक्षा वैज्ञानिक सूचना एवं प्रलेखन केन्द्र  
Defence Scientific Information & Documentation Centre  
मैटकॉफ हाऊस, दिल्ली - 110 054  
Metcalf House, Delhi - 110 054

*Thu, 16 May 2019*

## **Govt clears all bureaucratic obstacles to obtain 24 MH-60R Seahawk Anti-Sub Helicopters**

After several years of delays India cleared all the bureaucratic obstacles to finally obtain 24 American MH-60R Seahawk anti-submarine helicopters. These will cost about \$109 million each, which includes accessories, spare parts, tech support and the cost of establishing maintenance facilities for a new type of helicopter. Despite the higher cost India has found American military helicopters the best value for the money. In addition to newly ordered MH-60Rs India already has 15 CH-47F heavy transport helicopters on the way and some have recently begun arriving. In addition 22 AH-64E helicopter gunships will begin arriving later in 2019. The MH-60Rs will begin delivery in a year or so. The ability of the Americans to deliver quickly is another plus. The Americans take good care of their customers.

This MH-60R is a navalized version of the 11 ton U.S. Army UH-60. India will use the MH-60Rs for ASW (Anti-Submarine Warfare) as well as attacks on surface vessels (using Hellfire missiles). The ASW involves using computers, sonar, and radar to search for submarines. This work involves staring at a screen most of the time while manipulating the sensors and computers to detect and locate subs. Once you have a solid location fix, you can launch a torpedo and sink the enemy vessel.

The MH-60R uses a sonar that operates in active (broadcasting) and passive (just listening) mode. The sonar system consists of dipping sonar and sonobuoys, which are dropped and communicate wirelessly. The dipping sonar is lowered into the water from the helicopter using an 806 meter (2,500 foot) cable and winch. The MH-60R is also equipped with a radar system for detecting subs on the surface or just beneath the surface. Modern non-nuclear subs often travel just beneath the surface with only the periscope or snorkel above water, to provide air for the diesel engine, and gets rid of the exhaust fumes.

MH-60Rs can also perform SAR (search and rescue) work and to obtain maximum airtime and carrying capacity the sonar and all its associated electronics is quickly removed but the radar stays. The MH-60 can hover low enough to deploy a line to people in the water and winch people aboard.

For decades the Indian Navy has had problems with procuring new helicopters and the situation kept getting worse. The navy preferred proven foreign models like the MH-60R but their procurement bureaucracy excels at corruption, timidity and an exceptional talent for not getting things done. As a result, Indian warships equipped to handle helicopters have had, for nearly a decade, only 20 percent of the helicopters they are supposed to have. The main deficiency was in importing a suitable medium (10 ton class) helicopters (like the U.S. SH-60, Russian Ka-31 and the European EH101 or NH90). The main source of delays was the Indian effort to build a local design that met navy needs. Indian efforts to develop a local helicopter industry have been plagued by political and bureaucratic bungling. Despite that, after a half-century of effort, India did produce some Indian made naval helicopters, but not yet the heavier types the navy needs. The closest Indian manufacturers have come to filling navy needs was the locally designed and built Dhruv. In late 2013 the Indian Navy finally put its first squadron of Dhruv light helicopters into service. These were used for patrolling, search and rescue, and anything else the Navy needs, except for those jobs requiring a 10 ton class helicopter. It's been a difficult journey for the Dhruv. In 2009 the Indian Navy bought six of the Dhruvs for evaluation and did not like what they saw. The main complaints were lack of engine power and poor reliability. These were considered fatal flaws for helicopters meant for SAR and ASW.

Dhruv entered service in 2002 and the Coast Guard and the other services got a few of them for evaluation. The army actually bought 40 Dhruvs without thoroughly testing them. This purchase was made under intense pressure from the government to "buy Indian". Then the army discovered that, although the purchase contract stipulated that the Dhruv be able to operate at high altitudes (5,000 meters/16,000 feet), its engine (as the navy noted) was underpowered and could not handle high altitudes. So the army has to keep its older helicopters in service until the Dhruvs were upgraded.

The Dhruv can carry up to 14 passengers or four stretchers. Max load is 1.5 tons and endurance is about two hours (depending on load and altitude). The Dhruv can also fly as high as 6,000 meters (nearly 20,000 feet). Northern India has a lot of mountains, so operating at high altitude was a key design requirement. The 5.5 ton Dhruv has had a lot of problems and by 2009, a series of crashes indicated some basic design flaws, which the manufacturer insisted did not exist. The Navy disagreed. Although it is Indian made, until 2010, the Dhruv was assembled mostly (90 percent) with imported parts. The manufacturer had kept quiet about this because at least half the parts in "Indian made" weapons are supposed to be made in India. Since then the percentage of Indian made components has increased. As embarrassing as this revelation was, there were other problems that were more crucial.

The navy was desperate to replace about 30 of its elderly Sea Kings, which the MH-60s have replaced in many countries. The Sea Kings were a 1950s American design and the Indian Navy began receiving them from a British manufacturer in 1972. The last of 42 Sea Kings ordered arrived in the mid-1980s. As the Sea Kings got older they required more maintenance and a growing number were too worn out to use at all. Only six were lost to accidents and most were retired because of old age. The 30 that are still flyable only have a few years of useful life left. The U.S. is the main source of spare parts as most other suppliers have ceased production because so few Sea Kings are still in service.

The Sea Kings have a max speed of 209 kilometers an hour, max load of 3.5 tons, max altitude of 3,500 meters (11,500 feet) max range of 1,200 kilometers and max endurance of about six hours. The MH-60R has a max speed of 270 kilometers an hour, max load of 1.9 tons, max altitude of 3,500 meters (11,500 feet), max range of 830 kilometers and max endurance of about four hours.

The MH-60R ASW (Anti-Submarine Warfare) helicopters, which are also used for SAR (Search and Rescue), entered service in the 1980s as the SH-60. Most American military helicopters (UH-60, HH-60, MH-60) are militarized versions of the Sikorsky S-60, a 1970s design that won the competition to replace the older UH-1 "Huey". The UH-60 (for the army) was introduced in 1979. The latest version, the 11 ton UH-60M can carry 14 troops, or 1.1 tons of cargo internally, or four tons slung underneath. Cruise speed is 278 kilometers an hour. Max endurance is two hours, although most sorties last 90 minutes or less. Max altitude is 5,790 meters (19,000 feet). The army currently has about 2,000 UH-60s and is upgrading the force with the new "M" model. So far, over 3,000 UH-60 type helicopters have been built, mostly for the military. One reason the MH-60 is so popular is that the UH-60 has some much flight time, so many current or former pilots and so many people with experience maintaining it. There are so many UH-60s out there that spare parts are not only cheaper but are going to be available for a long time. None of the Russian or West European competitors have these advantages and India made the most of that.

<http://www.defencenews.in/article/Govt-clears-all-bureaucratic-obstacles-to-obtain-24-MH-60R-Seahawk-Anti-Sub-Helicopters-584713>

Thu, 16 May 2019

## Indian Army, Air Force, Navy combine might under Special Operations Division

*Major General AK Dhingra has been named the GCO of the Special Operations Division*

*By Krishna Mohan Mishra*

Special units of the Indian Army, Air Force and Navy will now combine forces under Special Operations Division to meet with possible threats and carry out sensitive missions.

It is for the first time in India's history that a Special Operations Division has been created which will see chosen personnel from all three armed forces as its members. A battalion each from Indian Army's Para Special Forces, Navy's Marcos (Marine Commandos) and Air Force's Garud Commandos will now operate under this common umbrella. There would be 3000 personnel in all and Major General AK Dhingra has been named as the first General Officer Commanding (GOC) of the Special Operations Division.

The headquarters of the Special Operations Division could be in Agra.

The proposal to have a common division between the Army, Air Force and Navy was approved by Prime Minister Narendra Modi at the Combined Commanders' Conference in Jodhpur in September of last year. Its need was felt considering the changing dynamics of modern warfare. The need for closer cooperation between the three forces has been recognised as the next step in meeting with security challenges facing India.

Established in 1966, Army's Para Special Forces was an obvious choice because it is one of the most elite units and has nine battalions under it. Equally effective in their operations are the Marcos - founded in 1987 - who are specially trained to deal with hostilities at sea or under water. The Garud Commando Force, formed in 2004, also receives special training and are responsible for guarding key installations. Personnel in all three of these elite forces have to undergo gruelling training and are equipped with modern and cutting-edge equipment.

<https://zeenews.india.com/india/indian-army-air-force-navy-combine-might-under-special-operations-division-2203652.html>



Thu, 16 May 2019

## Major General A K Dhingra appointed as the first Special Operations Division Commander

*The Division is also expected to be the first choice of the government for undertaking  
any major counter-terrorism operation both within and outside the country*

New Delhi: Ace Special Forces operative and Sri Lanka war veteran Major General AK Dhingra has been appointed as the first head of country's first tri-services Special Operations Division comprising commandos from all three services.

The Armed Forces Special Operations Division has been set up by the government to undertake joint operations by three services and will have elements from the Army's Parachute Regiments SF, Marine Commandos (MARCOS) of the Navy and the Garud Commandos of the Indian Air Force.

"Maj Gen Dhingra is a Special Forces veteran and is from the elite 1 Para Special Forces Regiment. He has done Special Operations courses in the US also and has been appointed as the first chief of the AFSOD," Army sources said.

The officer was also part of the Indian Peacekeeping Force Operations in Sri Lanka and has seen real combat from close quarters, they said.

The new division will work under the tri-services Integrated Defence Staff and will get its headquarters as per ongoing discussions in the Defence Ministry at either Agra or Bangalore, sources said.

The Division is also expected to be the first choice of the government for undertaking any major counter-terrorism operation both within and outside the country.

Defence Minister Nirmala Sitharaman, Defence Secretary Sanjay Mitra and the three services chiefs have played a major role in the implementation of the decision to set up three new agencies for Space, Cyber and Special Operations warfare. The proposal to set up the three agencies was given final approval by Prime Minister Narendra Modi at the Combined Commanders' Conference in Jodhpur last year.

<https://economictimes.indiatimes.com/news/defence/major-general-a-k-dhingra-appointed-as-the-first-special-operations-division-commander/printarticle/69339545.cms>



Thu, 16 May 2019

## India set to export first batch of missiles to South East Asian, Gulf countries: Official

*Indian defence sector sees good opportunities for exports to the South East Asian and the Gulf countries where slower economic growths have put budgetary pressure on acquiring viable, cost-effective and reliable solutions*

Singapore: India will export its first batch of missiles this year to the South East Asian and the Gulf countries after receiving "increasing interests" from them, a top defence official said here Wednesday.

Speaking at the IMDEX Asia 2019 exhibition, Commodore S K Iyer, Chief General Manager for HR at BrahMos Aerospace, said the first missile export contract awaits a government to government approval.

"A number of South East Asian countries are ready to buy our missiles," he said.

"It will be our first export and we have received increasing interests in the missiles from the Gulf countries," Iyer said at the three-day international maritime conference and exhibition which began here on Tuesday.

Indian defence sector sees good opportunities for exports to the South East Asian and the Gulf countries where slower economic growths have put budgetary pressure on acquiring viable, cost-effective and reliable solutions.

India-Russia joint venture BrahMos and defence company L&T Defence of Larsen & Toubro Ltd are showcasing a wide range of defence equipment at the IMDEX for the South East Asian markets.

Noting a significant change in market trends, industry observers said developing economies in the Middle East, South East Asia and South America were looking for viable, cost effective and reliable solutions.

They said that some of these small economies are looking for renewals of older assets through platform upgrades with latest technologies.

Budgetary constraints on defence procurement means life-span extension of older assets, said Martyn Allen, regional director for Asia at QinetiQ, a UK-based defence company with partners in India and a recently-opened regional office in Kuala Lumpur.

Export opportunities through collaboration with Indian defence industry were underlined by Captain Nick Macdonald-Robinson, a senior naval advisor at the Defence and Security Organisation of the UK Department of International Trade.

British companies are already establishing relationship with Indian shipyards which have a vast number of architects and huge amount of experience, Robinson said.

He pointed out that the large-scale expertise in Indian yards were not only involved in building indigenous designs, but also taking products from India-Russia joint venture into the export markets.

More than 236 defence companies are participating in the IMDEX 2019 exhibition.

Over 10,500 delegates and trade visitors are also attending the event where 23 warships from 30 countries are on display after conducting regional maritime exercises.

Over 400 delegates from the naval defence sector are attending the International Maritime Security Conference on "Safe and Secure Seas: Promoting Mutual Securities in our Maritime Commons".

<https://economictimes.indiatimes.com/news/defence/india-set-to-export-first-batch-of-missiles-to-south-east-asian-gulf-countries-official/articleshow/69339847.cms>



Thu, 16 May 2019

## Defence Space Agency to come up at Bengaluru

*"As per discussions, the tri-services defence space agency under the IAF officer is going to be headquartered in Bengaluru and is expected to get operational by the next month," govt sources said*

Soon after it successfully carried out an anti-satellite test, India is setting up its military space agency headquartered at Bengaluru with the ace fighter pilot Air Vice Marshal SP Dharkar as its likely head.

"As per discussions, the tri-services defence space agency under the Indian Air Force officer is going to be headquartered in Bengaluru and is expected to get operational by the next month," government sources told ANI.

The tri-services Space agency is likely to command all the space assets of the three services including the A-SAT capability, which can be used to destroy enemy space-based satellites and other assets.

However, the final decision has not yet been taken on the capabilities and assets to be given to this agency.

AVM Dharkar is an ace fighter pilot and is presently looking after the air defence operations of an important command along the borders.

Bengaluru seems to be an obvious choice as the location of the space agency as it is also the headquarters of ISRO, which manages all types of space programmes of the country.

Ace Special Forces operative and Sri Lanka war veteran Maj Gen AK Dhingra has been appointed as the first head of Country's first tri services Special Operations Division comprising commandos from all three services.

The Armed Forces Special Operations Division has been set up by the government to undertake joint operations by three services and will have elements from the Army's Parachute Regiments SF, Marine Commandos (MARCOS) of the Navy and the Garud Commandos of the Indian Air Force. Rear Admiral Mohit Gupta has been appointed as the head of the Defence Cyber Agency set up in Delhi with people from all three services.

[https://economictimes.indiatimes.com/news/defence/defence-space-agency-to-come-up-at-bengaluru/articleshow/69345697.cms?utm\\_source=Colombia&utm\\_medium=C1&utm\\_campaign=CTN\\_ET\\_hp&utm\\_content=19](https://economictimes.indiatimes.com/news/defence/defence-space-agency-to-come-up-at-bengaluru/articleshow/69345697.cms?utm_source=Colombia&utm_medium=C1&utm_campaign=CTN_ET_hp&utm_content=19)



Thu, 16 May 2019

## Indian Warships take part in International maritime defence exhibition in Singapore

*The IMDEX Asia-2019 commenced on May 14 and will also witness the participation of some of India's leading engineering and ship building firm*

Singapore: Two warships of the Indian Navy--INS Kolkata and INS Shakti--are participating in a three-day Asia Pacific naval and maritime event being held here, according to an official statement.

The International Maritime Defence Exhibition Asia (IMDEX Asia-2019) commenced on May 14 and will also witness the participation of some of India's leading engineering and ship building firms, including Larsen & Toubro and BrahMos, which makes the state-of-the-art air, sea and ground launch cruise missiles.

"Vice-Admiral M S Pawar, Deputy Chief of Naval Staff led the delegation to the Asia Pacific gathering of naval and maritime event," the Indian High Commission here said in a statement .

INS Kolkata is an advanced stealth destroyer capable of engaging multiple threats from the air, sea and underwater and has been designed and built in India.

INS Shakti is a fleet support ship to provide fuel, provisions and munitions to warships at sea. Following IMDEX, Indian Naval ships together with an Indian Navy surveillance aircraft P8I will participate in the 26th edition of Singapore India Maritime Bilateral Exercise (SIMBEX) scheduled from May 16 to 22, 2019.

SIMBEX is the longest uninterrupted naval exercise that India has with any other country, the statement said.

"Regular participation by the Indian Navy in the IMDEX and SIMBEX reflects the importance India attaches to the exercises and the broader strategic partnership with Singapore and it also reaffirms our Act East Policy," it said.

The 26th SIMBEX is taking place 6 months after the last edition that took place in the Andaman Sea and Bay of Bengal from November 11 to 21 last year.

It involved live weapon firings and complex military maneuvers, including those of aircraft and submarines.

The 25th SIMBEX was witnessed by Singapore's Minister of Defence Dr Ng Eng Hen.

Earlier in October 2018, India's Defence Minister Nirmala Sitharaman visited Singapore to participate in the ASEAN Defence Ministers Meeting-Plus.

The Indian Army and the Singapore Army recently held their 12th edition of the annual exercise Bold Kurukshetra, an annual joint training exercise for Armoured Units from April 8 to 12, 2019, at the Indian Army training facility at Babina in Utta Pradesh, the statement said.

Likewise, Air Forces of both countries will exercise together later this year in India, it said.

India and Singapore share a strong and rapidly growing defence relation which is the key pillar of India Singapore strategic partnership based on deep mutual trust and goodwill and shared interest in rules based order, maritime security and an open, inclusive and peaceful Indo-Pacific region.

“Our defence relation include annual ministerial dialogue, Secretary level defence policy dialogue, Staff talks between the three wings of the armed forces, mutual logistics support, regular exercises and exchange of ship visits,” the statement said.

<https://economictimes.indiatimes.com/news/defence/indian-warships-take-part-in-international-maritime-defence-exhibition-in-singapore/articleshow/69339675.cms>

*The Indian* **EXPRESS**

Thu, 16 May 2019

## Commemorating the strike: Abhinandan's Squadron now Falcon

*The 51 Squadron patch depicts a MIG-21 BISON in the foreground and a red coloured F-16 in the background under crosshairs. The other squadron's patch shows a SU-30MKI with a AMRAAM missile going past it after missing to hit it*

*By Man Aman Singh Chhina*

Chandigarh: The MiG 21 BISON Squadron, of which Wing Commander Abhinandan Varthaman was a part of when he took on intruding aircraft of Pakistan Air Force (PAF) in Jammu and Kashmir on February 27 this year and shot down a F-16 aircraft, has taken on a new sobriquet.

Adopting the name ‘Falcon Slayers’, the squadron has got special uniform patches made to commemorate the aerial fight. The F-16 that Abhinandan shot down has been named by its maker as the Falcon.

Not to be left behind, the Sukhoi-30 squadron, whose aircraft also blunted the subsequent Pakistani air attack and successfully evaded US-made AMRAAM missiles, adopted the title of the ‘AMRAAM Dodger’.

These patches are cloth badges which depict the squadron's role or identity and often commemorate an important engagement in which the squadron took part. They also depict the type of aircraft the squadron flies.

The 51 Squadron's patch depicts a MIG-21 BISON in the foreground and a red coloured F-16 in the background under crosshairs. The Sukhoi squadron's path meanwhile shows a SU-30MKI with a AMRAAM missile going past it after missing.

IAF spokesperson Group Captain Anupam Bannerjee said it was common for squadron pilots to wear patches. “Patches instill a sense of pride in not only the present generation of pilots but also the future ones. It gives a sense of achievement to the pilot,” he said.

The patches for both squadrons have been designed by young aviation enthusiast, Saurav Chordia. Though he just graduated, this isn't the first time he is designing IAF patches.

Speaking to The Indian Express, Chordia confirmed that he designed the two patches. “I got a request from the two squadrons last month and after a few changes, the final design was approved by them,” said the fresh graduate.

Originally from Assam and now based in New Delhi, the first patch Chordia designed for the IAF was for the SU-30MKI squadron when he was still in college in 2015. I have also designed the patches for the first Tejas squadron in the country, he added.

<https://indianexpress.com/article/india/iaf-wing-commander-abhinandans-squadron-gets-falcon-slayer-patches-to-mark-f-16-kill-5728984/>



*Thu, 16 May 2019*

## **India Cuts Down Purchase of 22 MQ-9 Predator B Guardian Drones**

India had plans to purchase 22 Sea Guardian drones for the navy, valued at around \$2 billion. Instead, it will be around 12 such drones according to the new proposal, as the ministry wants to maximise the utilisation of the limited financial resources available to it, the source added.

The Indian Defence Ministry will soon approve the purchase of American Sea Guardian unmanned aerial vehicles (UAV) and MQ-9 Reapers for the country's armed forces, but the number of purchase will be less than what was originally planned last year.

Government sources have revealed that a formal document will soon be issued to the US in this regard, after Washington has sent the "price and availability" details for Sea Guardian, which can carry out long-endurance, high-altitude surveillance, as well as carry Hellfire air-to-surface missiles, advanced marine avionics, and laser-guided bombs.

On 17 June, 2016, the Indian Defence Ministry sent a letter of request (LoR) to the US seeking to purchase 22 MQ-9 Predator B Guardian maritime patrol remotely piloted vehicles from General Atomics for protection and vigilance of its maritime assets in the Indian Ocean.

However, the Indian ministry will also ask for a non-maritime version for the army and air force.

The Guardian is the maritime variant of the Predator B. It is fitted with a Raytheon SeaVue multimode maritime radar under its belly that provides wide-area intelligence and surveillance. Predator B has an endurance of over 27 hours, a speed of 240 KTAS, can operate at an altitude of up to 50,000 feet, and has a 3,850 pound (1,746 kg) payload capacity that includes 3,000 pounds (1,361 kg) of external stores.

The deal was put on hold during the last two years, as India did not sign the communication framework. However, the two countries have expedited the negotiation since last September, when India signed the Communications Compatibility and Security Agreement (COMCASA), which, according to the joint statement released after the meetings, "will facilitate access to advanced defence systems and enable India to optimally utilize its existing U.S.-origin platforms".

Dr Subhash Bhamre, India's minister of state for defence, informed the Indian Parliament on 20 December 2017 that: "A request for Information (RFI) for Predator 'B' Sea Guardian was issued to the US Office of Defence Cooperation on November 14 and the response is awaited".

He also informed that the deal does not involve a transfer of critical technology to India.

<http://www.defencenews.in/article/India-Cuts-Down-Purchase-of-22-MQ-9-Predator-B-Guardian-Drones-584712>

*Thu, 16 May 2019*

## **Treaty under cloud, Nuclear Test Ban Agency asks India to turn "Observer"**

The Comprehensive Nuclear-Test-Ban Treaty Organisation (CTBTO) has invited India to become an "Observer" with access to International Monitoring System data, so it can take an informed decision on ratifying a much-debated nuclear disarmament treaty.

The CTBT is a global treaty that aims to ban all nuclear explosions across the world. In 1996, it was adopted by the United Nations General Assembly and opened for signature. Between 1945 and 1996, over 2,000 nuclear tests were carried out all over the world. Ten nuclear tests have been conducted ever since the CTBT opened for signature in 1996. Although 184 countries have signed the treaty so far, it is yet to come into force because eight countries with nuclear capabilities - including India - are yet to sign and ratify it.

India has claimed in the past that the CTBT is discriminatory because it favours "five nuclear weapon states"- the United States, United Kingdom, China, France and Russia - when it comes to fulfilling obligations for eliminating nuclear weapons. Instead, it wanted the CTBT to have a clause on complete nuclear disarmament in a time-bound manner because there are technological differences between the 'have' and 'have not' countries. India was concerned about the likelihood of those already possessing nuclear weapons upgrading their arsenals through sub-critical and laboratory simulated testing.

Lassina Zerbo, the executive secretary of the Comprehensive Test Ban Treaty Organization (CTBTO), said, "I am not asking India to ratify the treaty. But it can become an Observer, allowing India to attend our meeting, see how CTBTO works, and take the time needed to make the decision."

He was addressing a group of Indian journalists at the CTBTO headquarters located in Vienna, the capital city of Austria, on May 10. Mr Zerbo said that he understands India's apprehensions, and would try his best to win the country's trust by addressing them.

The CTBTO runs the International Monitoring System or IMS, which can detect nuclear tests anywhere across the world.

"Being an observer would give India access to data from the International Monitoring System's 337 facilities located in 89 countries that monitor the planet for signs of nuclear explosions. This system can detect even small nuclear explosions using seismology, hydro-acoustics, infrasound and radionuclide technologies. Nowhere can you get this quality of data necessary for earthquake monitoring. The IMS also helps warn of tsunamis and volcanic ash, and identifies plane crash sites," said Mr Zerbo.

He recalled how the IMS had detected a low-magnitude, one-tonne yield nuclear test conducted by North Korea in 2006 even though only 50% of its capacity had been developed by then. The detection ability has become much higher now, given that the capacity has gone up to 90%, he added.

Although the United States, China, Iran, Israel and Egypt have signed the treaty, they are yet to ratify it. India, Pakistan and North Korea have not even signed the treaty.

So, is the CTBTO proactive enough to bring India aboard after the failed talks in 1996? "A few years ago, a delegation was sent to Pakistan and India to offer them Observer status. While Pakistan accepted it, the delegation could not even meet the Indian authorities," said Mr Zerbo.

Upon being asked why the organisation was not putting pressure on countries like the United States and China to ratify the treaty, the CTBTO executive secretary said that Beijing was taking small steps

in this direction. "Five IMS stations have been certified in China over the last 15 years. The US continues to be the biggest funder for the CTBTO, and has not cut funds at any point," he added.

For a start, Mr Zerbo has invited India to participate in the science and technology conference scheduled between June 24 and 28 in Vienna. The conference - which will bring together over 1,000 academics, scientists and CTBTO policy makers - will be addressed by former United Nations Secretary-General Ban Ki-moon on June 24.

"The conference aims to bring together countries that are not signatories to the CTBT. India can come and participate in scientific and technological discussions, where you can see what is up there and make a decision whether to join us as an Observer or not. That's all I am hoping for. A small step for a country like India would mean a huge (leap for the) international community," said Zerbo, who hails from Burkina Faso.

NDTV tried to contact Raveesh Kumar, official spokesperson and Joint Secretary of the Union Ministry of External Affairs, for his reaction to the CTBTO chief's statements but is yet to receive a response.

<http://www.defencenews.in/article/Treaty-Under-Cloud,-Nuclear-Test-Ban-Agency-Asks-India-To-Turn-Observer-584711>

## THE TIMES OF INDIA

Thu, 16 May 2019

# Chandrayaan-2 will carry NASA payload too, will calculate Earth-Moon distance

By Surendra Singh

New Delhi: Indian Space Research Organisation (Isro) has for the first time revealed that Chandrayaan-2 lunarcraft, to be launched in July, will carry a Nasa "passive experimental instrument" to the Moon. The US space agency will use this module to calculate the distance between the Earth and the Moon.

Besides the solitary foreign experimental module, Chandrayaan-2, involving an orbiter, lander 'Vikram' and rover 'Pragyan' will also carry 13 Indian payloads that will be used to conduct different scientific experiments and for taking images on the Moon, as reported by TOI earlier.

Giving details of the Nasa module to TOI, Isro chairman K Sivan said, "The laser reflector arrays from Nasa will just be a passive experimental module onboard Chandrayaan-2. US scientists will use it to take measurements of the distance between the Earth and the Moon. The instrument, which has been attached to the lander, will be able to precisely mention the location of the lander on the Moon's surface." He told TOI that "Nasa made the request for the experimental module last July and we accepted its request in September last year".

During the Lunar and Planetary Science Conference held at Texas, US, in March, Nasa had confirmed that Chandrayaan-2 and Israeli lander Beresheet, which crashlanded on the Moon's surface on April 11 this year, would each carry Nasa-owned laser retroreflector arrays. However, Isro did not disclose about the Nasa instrument till now.

The 13 Indian payloads, which are being provided by Indian institutes, are large area soft X-ray spectrometer (LASS) from Isro Satellite Centre (ISAC) and solar X-ray monitor (XSM) from

### HIGHLIGHTS

- Chandrayaan-2, involving an orbiter, lander 'Vikram' and rover 'Pragyan' will also carry 13 Indian payloads that will be used to conduct different scientific experiments and for taking images on the Moon
- Nasa's "passive experimental instrument" on board will use this module to calculate the distance between the Earth and the Moon

Ahmedabad-based Physical Research Laboratory (PRL), imaging IR spectrometer (IIRS) from Ahmedabad-based Space Applications Centre (SAC), Ahmedabad, synthetic aperture radar in L- and S-band (SAR) from SAC, neutral mass spectrometer (CHACE-2) from Thiruvananthapuram centre, terrain mapping camera-2 (TMC-2) from SAC, Vikram lander sensor complement, radio anatomy of Moon bound hypersensitive ionosphere and atmosphere (RAMBHA), Chandra's surface thermo physical experiment (ChaSTE ), instrument for lunar seismic activity (ILSA), laser reflector array (LRA), rover sensor complement (APXS, LIBS) and laser induced breakdown spectroscopy (LIBS).

Chandrayaan-2 craft weighing 3.8 tonne is scheduled to be launched between July 9 and July 16 and is expected to land on the Moon on September 6. Last time, Chandrayaan-1 mission, launched in 2008, carried five foreign payloads (three from Europe and two from the US). Once Chandrayaan-2 spacecraft reaches the lunar orbit, Vikram will separate from the orbiter and soft-land at a predetermined site close to the Moon's south pole, which has not been explored by other countries.

Talking to TOI earlier, Isro chairman K Sivan said, "Once Vikram lands on the lunar surface on September 6, rover Prayan will come out of it and roll out on the lunar surface for 300-400 metre. It will spend 14 Earth days on the Moon for carrying out different scientific experiments. " The rover will analyse the content of the lunar surface and send data and images back to the Earth through the orbiter within 15 minutes, he said.

<https://timesofindia.indiatimes.com/india/nasa-module-will-be-on-board-chandrayaan-2-will-calculate-earth-moon-distance/articleshow/69349959.cms>

