

समाचार पत्रों से चयित अंश Newspapers Clippings

दैनिक सामयिक अभिज्ञता सेवा
A Daily Current Awareness Service

Vol. 44 No. 170B 01 - 02 Sep 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

DRDO fostering civil-military ties in Ladakh

By Shimona Kanwar

Ladakh: On his visit to the Leh-based Defence Institute of High Altitude Research (DIHAR) of DRDO, the defence minister, Rajnath Singh, asked the scientists to develop a high altitude survival model within three years when it completes 60 years of its establishment. He asked the scientists to take up the challenge to recycle the waste plastics into model greenhouse.

Ladakh is celebrating the spirit of Civil-Military Cooperation through the Ladakhi-Kisan-Jawan-Vigyan Mela. The 26th Mela was inaugurated by the defence minister. As a spin-off of the technologies developed, farmers in Ladakh are able to produce a variety of fruits and vegetables resulting in improving their socio-economic condition.

The interdependence created between the locals and the army through the scientific endeavours of DIHAR has contributed to socio-economic upliftment of local farmers. The institute is known for many success stories in translating science to alleviate real-life problems being faced in the remote Ladakh region. DIHAR is now working to develop newer technologies to make fresh food available even in the remotest locations in the Himalayas.



Rajnath Singh visited the experimental farm of DIHAR where technologies for the production of quality organic fruits and vegetables are being demonstrated. He was shown the greenhouse technology, soilless cultivation technology, potato storage technology and growing melons under cold climatic conditions.

Some 40,000 local farmers, military and paramilitary personnel participated in this 2-day event. On the occasion, Dr Satheesh Reddy, chairman DRDO asked scientists of DIHAR to work on the wonder plant, Rhodiola, so that every household and the Jawans benefit from the high-value medicinal plant. He asked DIHAR to reach to 25,000 farmers in Ladakh from the present 10,000 numbers.

Dr OP Chaurasia, director DIHAR briefed Rajnath about the large size vegetables and quality fruits being grown in Ladakh using DIHAR's technology.

<https://timesofindia.indiatimes.com/india/drdo-fostering-civil-military-ties-in-ladakh/articleshow/70924725.cms>

Lt Gen Mukund Naravane takes charge as Vice Chief of Indian Army; Ex-Eastern Commander in race for top post after Bipin Rawat's retirement

- *In his 37 years of service, Naravane has served in numerous command and staff appointments in peace, field and highly active counter-insurgency environments in Jammu and Kashmir and the Northeast*
- *He has also commanded a Rashtriya Rifles Battalion in Jammu and Kashmir and an infantry brigade on the eastern front*
- *Naravane will be in contention for the Army chief's post as he will be the senior-most commander when incumbent Army Chief General Bipin Rawat retires on 31 December*

New Delhi: Lieutenant General Manoj Mukund Naravane on Sunday assumed charge as the vice chief of the 1.3 million-strong Indian Army. Naravane will be in contention for the Army chief's post as he will be the senior-most commander when incumbent Army Chief General Bipin Rawat retires on 31 December, official sources said.

Naravane succeeds Lieutenant General D Anbu who retired from service on Saturday. Before taking charge as vice chief of the Army Staff, Naravane was heading the Eastern Command of the Army which takes care of India's nearly 4,000-kilometre border with China.

In his 37 years of service, Naravane has served in numerous command and staff appointments in peace, field and highly active counter-insurgency environments in Jammu and Kashmir and the Northeast.

He has also commanded a Rashtriya Rifles Battalion in Jammu and Kashmir and an infantry brigade on the eastern front. He was also part of the Indian Peace Keeping Force in Sri Lanka and had served as India's defence attache at the Indian Embassy in Myanmar for three years.

Naravane is an alumnus of the National Defence Academy and the Indian Military Academy. He was commissioned into the 7th battalion, the Sikh Light Infantry Regiment in June 1980.

"He brings with him an enormous amount of experience in serving in the most challenging areas," the Army said in a release. The General is a decorated officer who has been awarded the 'Sena Medal' (Distinguished) for effectively commanding his battalion in Jammu and Kashmir.

He is also a recipient of the 'Vishisht Seva Medal' for his services as the Inspector General Assam Rifles (North) in Nagaland and the 'Ati Vishisht Seva Medal' for commanding of a prestigious strike corps. He was also honoured with 'Param Vishisht Seva Medal' for his distinguished services as the GOC-in-C of the Army Training Command.

<https://www.firstpost.com/india/lt-gen-mukund-naravane-takes-charge-as-vice-chief-of-indian-army-ex-eastern-commander-in-race-for-top-post-after-bipin-rawats-retirement-7265011.html>

Lt Gen Paramajit Singh likely to be first Deputy Chief Strategy

The new office of Army Deputy Chief (Strategy) is being created as a part of restructuring the Army headquarters by Army Chief General Bipin Rawat

By manjeet Singh Negi

New Delhi: Lieutenant General Paramajit Singh is likely to become the first Army Deputy Chief (Strategy) after he takes charge as the new Director General Military Operations (DGMO) from October 15 this year.

Soon after assuming the new post of DGMO, he is expected to be elevated as the first Deputy Chief of Army Staff (Strategy) where he would be in charge of both operations and military intelligence.

Lt Gen Paramajit Singh is currently the GOC of Nagrota based 16 Corps.

As DGMO, the officer will look after Army operations in Jammu and Kashmir and the northeastern states along the borders with both China and Pakistan.

The new office of Army Deputy Chief (Strategy) is being created as a part of restructuring the Army headquarters by Army Chief General Bipin Rawat.

The defence ministry has approved the restructuring of the Indian Army Headquarters under which over 200 officers will be sent out of Army headquarters to field formations, while new offices will be created for strategic communication.

The force is also preparing itself for creating new fighting formations known as integrated battle groups to fight new generation wars.

<https://www.indiatoday.in/india/story/lt-gen-paramajit-singh-likely-first-deputy-chief-strategy-1594206-2019-09-01>

First integrated battle group to be deployed along India-Pakistan border

Restructuring of the combat potential of the Indian army will happen “selectively from sector to sector,” Chief of Army Staff General Bipin Rawat said

By Sudhi Ranjan Sen

New Delhi: As tensions simmer on the 3,323-km-long India- Pakistan border, the Indian army is set to deploy its first Integrated Battle Group (IBG) along the frontier by the end of this year, Chief of Army Staff General Bipin Rawat said. In all, the Indian Army plans to form and deploy 11 -13 IBGs to protect its western and eastern borders.

The ministry of defence (MoD) has cleared the reorganisation of IX Corps, based in Yol in Himachal Pradesh, to form the IBGs to be deployed along the western border. Raised in 2009, IX Corps is one of the army’s youngest corps and is part of the Chandimandir, Haryana-based Western Army Command.

This is one of the biggest reorganisations of the Army and General Rawat is its prime mover.

Restructuring of the combat potential of the Indian army will happen “selectively from sector to sector,” Rawat said. “The international border portion of J&K Kashmir will see reorganisation first followed by others, making the Indian army a leaner and meaner fighting unit,” general Rawat said, explaining the rationale behind the exercise.

In contrast with the traditional and somewhat antiquated fighting units of the army Corps, each of which comprises at least three brigades, the IBGs are smaller, meaner, self-contained fighting units, including elements of air power, artillery, armour. The IBG will encompass 6-8 battalions depending on the terrain where it is deployed and the purpose it is meant for...The composition of the IBGs will vary depending on the “task” and the “order of battle,” said a senior Army officer who did not want to be named.

“The IBGs, on an average, would comprise 20,000- 25,000 men,” said the officer. While each IBG will be a self-contained fighting unit, it can draw logistical support from other formations. The IBGs will be smaller and more flexible, allowing faster mobilisation. The formation of the IBGs, among other things, will drastically cut the time required to mobilise the strike arms of the Army. Each IBG will be commanded by an officer of the rank of major general.

The Siliguri-based XXXIII Corps, tasked with protecting the Indo-Tibetan border including Sikkim, is next in line for being transformed into an IBS. The XXXIII Corps, which moved to its present location in 1962, comprises the Black Cat, Kirpan and Striking Lion divisions and an artillery division – an estimated 30,000 thousand soldiers.

The XXXIII Corps is likely to be reorganised into five IBGs, each tasked differently, a second senior officer requesting anonymity said. The recently raised, Panagarh, West Bengal-based Mountain Strike Corps, or Brahmastra Corps, the only strike corps designated to fight along the India-China border, will also be restructured to form three IBGs.

<https://www.hindustantimes.com/india-news/first-integrated-battle-group-to-be-deployed-along-india-pakistan-border/story-wrvIDDDkQHqcBwxwFI2wpN.html>



Mon, 02 Sep 2019

Army to open 8 streams for women

No word on existing SSC officers; Infantry kept out

By Ajay Banerjee

New Delhi: A year after Prime Minister Narendra Modi announced permanent commission for women, the Indian Army is ready to formally announce allowing women in eight more streams within the force.

The Army headquarters is readying a ‘terms of reference’ that will guide the induction of women. The terms of reference — that will lay down qualifying parameters for promotions like fitness levels, courses to be completed and exams to be cleared — will be announced soon, sources said.

In March, the government had announced its decision to allow women in newer areas, but awaited terms of reference before opening up the force for women.

It is now clear that the policy will not benefit women officers earlier inducted under the Short Service Commission (SSC), say five or 10 years ago.

A letter detailing the consent of the President, who is the Supreme Commander of the forces, says: “The policy will come into effect prospectively.” It means the existing SSC officers, who serve for 14

years, will not benefit. The Ajai Vikram Singh Committee, which gave its report 15 years ago, spoke about having more SSC officers, but that hasn't happened. The government has approved women as permanent commissioned officers in Signals, Engineers, Army Aviation, Army Air Defence, Electronics and Mechanical Engineers, Army Service Corps, Ordnance Corps and Intelligence. These eight streams will be in addition to the women who are already in Judge Advocate General (JAG) and Army Education Corps. In this, aviation is crucial as only the IAF and Navy allow women into the aviation.

Ground-based combat like infantry or armoured in the Army will continue to be closed for women.

In the IAF, Wing Commander Shalija Dhama became the country's first woman officer to be appointed as flight commander of a unit. She flies helicopters and has been taken in as permanent commission officer.

The IAF has decided that wherever men SSC officers are eligible for permanent commission, women will also be given a chance as equals. They will have to meet the parameters of the force. "There is no quota of vacancies between men and women officers," an official explained.

In the Navy, all branches barring those that are sea-going are open for women.

Doors opened to

- Signals
- Engineers
- Army Aviation
- Army Air Defence
- EME (Electronics & Mechanical Engineers)
- Army Service Corps
- Ordnance Corps
- Intelligence

<https://www.tribuneindia.com/news/nation/army-to-open-8-streams-for-women/826368.html>

दैनिक जागरण

Sun, 01 Sep 2019

रूस के एयर शो में IAF के पायलटों ने उड़ाया MiG 35

अगले सप्ताह प्रधानमंत्री नरेंद्र मोदी रूस जा रहे हैं। ऐसे में क्यास लगाया जा रहा है कि

प्रधानमंत्री के सामने रूस अपने विमानों के बिक्री की पेशकश करेगा।

नई दिल्ली: रूस में आयोजित एयर एक्जीबिशन में भारतीय वायुसेना के पायलटों ने लड़ाकू विमान MiG 35 का हवाई परीक्षण किया। यह एक्जीबिशन रूस के जुखोवस्की में आयोजित किया गया। इस एयर शो में रूस ने अपने लड़ाकू विमानों को पेश किया। ऐसा माना जा रहा है कि अपने विमानों की बिक्री के उद्देश्य से ही रूस में शो आयोजित किया गया।

भारतीय वायु सेना के प्रतिनिधिमंडल ने इंटरनेशनल एविएशन एंड स्पेस सलोन MAKS 2019 के लिए रूस का दौरा किया। यह शो 27 अगस्त और 29 अगस्त को मॉस्को के करीब जुखोवस्की अंतरराष्ट्रीय हवाई अड्डे पर किया गया। प्रतिनिधिमंडल का नेतृत्व एयर ऑपरेशन के डायरेक्टर जनरल एयर मार्शल अमित देव ने

किया। प्रतिनिधिमंडल को सुखोई 57E भी दिखाया गया जो रूसी सुपरसोनिक स्टील्थ जेट फाइटर के पांचवें जेनरेशन का विमान है और इसे निर्यात के लिए पेश किया गया।

वायुसेना ने ट्वीट कर बताया, 'भारतीय प्रतिनिधिमंडल को MiG-35 व Su-57 दिखाया गया। भारतीय वायु सेना के पायलटों को इसे उड़ाने का मौका भी दिया गया।' अधिकारियों ने बताया कि दोनों ही विमान बिल्कुल नए वर्जन हैं। जुलाई में वायुसेना प्रमुख बीएस धनोवा ने रूस में MiG-35 की जांच की थी। उन्होंने स्पष्ट किया कि वायुसेना इस नए जेट को अच्छे से परखने के बाद ही चुनाव करेगी। सूत्रों के अनुसार, एयर शो में नए कस्टरमर को आकर्षित करने के लिए रूसी फाइटर विमानों को दिखाया गया।

ऐसा माना जा रहा है कि अगले सप्ताह प्रधानमंत्री नरेंद्र मोदी के रूस जाने पर भारत के सामने विमानों की बिक्री का प्रस्ताव रखा जा सकता है। रूस के राष्ट्रपति व्लादिवोस्तोक से प्रधानमंत्री नरेंद्र मोदी मुलाकात करेंगे।

THE ECONOMIC TIMES

Sun, 01 Sep 2019

IAF pilots test fly MiG 35 at Russian air show

An IAF delegation had visited Russia for the International Aviation and Space Salon MAKS 2019 air show that was held at the Zukhovski International Airport near Moscow between August 27 and 29

New Delhi: Pilots of the Indian Air Force (IAF) conducted test flights of the MiG 35 fighter aircraft during an ongoing air exhibition in Zukhovski, Russia.

An Indian Air Force (IAF) delegation had visited Russia for the International Aviation and Space Salon MAKS 2019 air show that was held at the Zukhovski International Airport near Moscow between August 27 and 29.

The delegation was led by Air Marshal Amit Dev, Director General Air Operations.

The delegation was also shown the Sukhoi 57E, the export version of the fifth-generation Russian supersonic stealth jet fighter at the air exhibition.

"The Indian delegation were shown MiG-35 and Su-57 aircraft. Indian Air Force test pilots G/C BS Reddy and W/C FL Roy got an opportunity to fly two sorties on MiG-35 aircraft during the visit," the IAF tweeted. The MiG-35 is a 4++ generation Mikoyan multi-role combat aircraft that comes in single- and twin-seater versions too. Officials said the MiG 35 as well as the Sukhoi 57E were entirely new version of the aircraft.

In July, the IAF Chief B.S. Dhanoa had inspected the MiG-35 during his Russia visit.

Dhanoa had clarified that the IAF would select a new jet only after following the due process of tender, evaluation and test flights. The MiG-35 has a sturdier frame, is fitted with an Active Electronically Scanned Array radar and has been fitted with state-of-the-art latest Russian missile weapons. Sources said the fighter jets were shown at the air show to attract new customers as well as those already using Russian fighter aircraft.

It is also being speculated that Russia might offer a sale of the aircraft to India during Prime Minister Narendra Modi's visit to the country next week. Modi and Russian President Vladimir Putin are scheduled to meet in Vladivostok.

"The sorties flown by the IAF pilots were regular test flights during the air exhibition. It is not yet clear if India will purchase the aircraft from Russia," an IAF official told IANS.

<https://economictimes.indiatimes.com/news/defence/iaf-pilots-test-fly-mig-35-at-russian-air-show/articleshow/70922803.cms>

India not perturbed over short-range nuclear capable Ghaznavi missile test by Pakistan

The M-11 missiles were acquired by Pakistan from China along with blue-prints of the U-235 nuclear device in 1987

By Shishir Gupta

New Delhi: India's national security establishment is not unduly perturbed by Pakistan's test of the short-range nuclear capable Ghaznavi missile last Thursday which they believe is part of Islamabad's continued sabre-rattling over the Kashmir issue and will not indulge in a tit-for-tat counter, national security officials said on condition of anonymity.

However, the officials, and external affairs officials and scientists Hindustan Times spoke to say that the launch underscores the deep dependence of Pakistan on China for its missile capability (the Ghaznavi's delivery system is a derivative of the Chinese M-11 missile). They added that India's own missile capabilities are much more advanced than Pakistan's.

The M-11 missiles were acquired by Pakistan from China along with blue-prints of the U-235 nuclear device in 1987. North Korea also played a significant role in Pakistan's missile development.

Pakistan has sought to internationalise India's move to bifurcate the state of Jammu & Kashmir into two union territories and to scrap constitutional provisions that gave the state special status and its residents special privileges.

The Indian officials said local missile developers and the Strategic Force Command are confident of India's capabilities and have no intention of getting into a wrestling match with Rawalpindi GHQ. "The whole idea behind these intemperate statements of war in the sub-continent is to provoke an Indian political reaction and force P-5 (the permanent members of the UN Security Council) to preach peace to the Modi government," one official said.

The officials said India's missile capability and potential is way beyond the declared range levels for land-based as well as submarine based delivery systems. The Agni-5 missile platform has a 5,000 km range and the Ship Submersible Ballistic Nuclear Arihant (submarine) has a proven missile with a range of 700 km proven missile and the Defence Research development Organisation has also successfully tested the 3,000 km range submarine-fired K-4 missile. According to experts, while there is no successor to Agni-5 on drawing board, the ranges of existing missiles in India's armory can be improved drastically if the political leadership gives permission.

"Pakistan should understand the reason behind the growing ambiguity of the Narendra Modi government over the traditional "no first use" draft nuclear doctrine. India cannot have NFU with both its neighbours practising first use doctrine and Islamabad threatening Armageddon to the world time and again to fulfil its political agendas," said another official.

<https://www.hindustantimes.com/india-news/india-not-perturbed-over-ghaznavi-test-by-pakistan/story-yaBnXsSgJi0J2XtymI6UqN.html>

चंद्रयान-2: आज अपने 'मायके' से 'ससुराल' के लिए रवाना हो सकता है लैंडर विक्रम, इसरो ने की तैयारी

इसरो ने कहा है चंद्रयान-2 के माइयूल से लैंडर विक्रम और रोवर प्रज्ञान आज अलग हो सकते हैं। दोनों के बीच यह अलगाव काफी तेज होगा। इसके बाद विक्रम लैंडर लगातार नीचे चंद्रमा की सतह की ओर बढ़ता जाएगा।

बेंगलुरु: भारत के महत्वाकांक्षी चंद्र मिशन चंद्रयान-2 के लिए आज का दिन बेहद अहम होने जा रहा है। 'चंद्रा मामा' से मुलाकात के लिए बेकरार चंद्रयान-2 अब चंद्रमा की पांचवीं कक्षा में प्रवेश कर चुका है। भारतीय अंतरिक्ष एजेंसी (इसरो) के मुताबिक, आज दोपहर में 12.45 से 1.45 बजे के बीच चंद्रयान-2 के माइयूल से लैंडर विक्रम और रोवर प्रज्ञान अलग हो सकते हैं। यह अलगाव कुछ उसी तरह से होगा जैसे शादी के बाद दुल्हन अपने मायके से ससुराल के लिए रवाना होती है।

शनिवार को इसरो वैज्ञानिकों की उच्च स्तरीय बैठक के बाद यह फैसला लिया गया था। समीक्षा बैठक में शामिल एक अधिकारी ने कहा, 'लैंडर और रोवर के अलग होने का समय सोमवार को दोपहर 1.30 बजे रखा गया है। एक अन्य वैज्ञानिक ने बताया कि चंद्रयान-2 के पांचवीं कक्षा में प्रवेश करने के बाद लैंडर और रोवर को अलग करने का फैसला लिया गया। कक्षा बदलने में इसे 52 सेकंड का वक्त लगा। इस कक्षा की चांद से न्यूनतम दूरी मात्र 109 किलोमीटर है।

बहुत तेज होगा लैंडर विक्रम का सेपरेशन

इसरो के चेयरमैन के. सिवन के मुताबिक 2 सितंबर को होने वाला लैंडर सेपरेशन काफी तेज होगा। यह उतनी ही गति से होगा, जितनी गति से कोई सैटलाइट लॉन्च वीडकल से अलग होता है। इसमें करीब एक सेकंड लगेगा। इंटीग्रेटेड स्पेसक्राफ्ट को अलग-अलग करने के लिए जरूरी कक्षा सोमवार को स्थिर करने के बाद इसरो कमांड देगा जो ऑनबोर्ड सिस्टम अपने आप एग्जिक्यूट करेगा। इस अलगाव की प्रक्रिया में उसी तकनीक का इस्तेमाल किया गया है जिसका पायलट लड़ाकू विमान में खराबी आने के बाद अपनी जान बचाने के इजेक्ट होने के लिए करते हैं।

कैसे अलग होगा लैंडर

ISRO के एक वैज्ञानिक ने बताया कि ऑर्बिटर के ऊपर लगे फ्यूल के एक्सटेंशन में लैंडर और रोवर रखे गए हैं जो कि क्लैंप और बोल्ट से अटैच हैं। उन्होंने बताया कि एक स्प्रिंग के दो तरफ लैंडर और रोवर जुड़े हुए हैं। जिस बोल्ट से स्प्रिंग लगा हुआ है उसे कमांड के जरिए काट दिया जाएगा और लैंडर अलग हो जाएगा। इसके बाद विक्रम लैंडर लगातार नीचे चंद्रमा की सतह की ओर बढ़ता जाएगा।



सिवन ने कहा कि ऑर्बिटर और लैंडर का यह अलगाव कुछ उसी तरह से होगा जैसे दुलहन अपने पिता के घर से ससुराल के लिए रवाना होती है। सोमवार के बाद से हमारा पूरा फोकस विक्रम पर होगा। हालांकि एक अन्य टीम ऑर्बिटर पर नजर रखेगी। उन्होंने बताया कि 1 सितंबर को विक्रम की चांद की सतह पर पूर्वाह्न 1:55 बजे सॉफ्ट लैंडिंग करवाई जाएगी। बता दें कि चंद्रयान-2 लगातार चंद्रमा की अद्भुत तस्वीरें भेज रहा है। 2 सितंबर को लैंडर विक्रम कंपोजिट बॉडी से अलग होगा।



सॉफ्ट लैंडिंग

इसरो ने कहा, 'अंतरिक्ष यान के सभी मानक सामान्य तरीके से काम कर रहे हैं। 1 सितंबर को लैंडर चंद्रमा की सतह पर सॉफ्ट लैंडिंग करेगा और इसके 4 घंटे बाद रोवर प्रज्ञान बाहर आएगा जो कि चंद्रमा की सतह पर 14 दिनों में कुल 500 मीटर की दूरी तय करेगा। चंद्रमा के हिसाब से यह एक दिन होगा क्योंकि एक लूनर डे पृथ्वी पर 14 दिनों के बराबर होता है। लैंडर चंद्रमा के दक्षिणी ध्रुव पर लैंड करेगा। सॉफ्ट लैंडिंग के बाद अमेरिका, रूस और चीन के बाद भारत का नाम भी इस उपलब्धि में शामिल हो जाएगा। चंद्रयान-2 को 22 जुलाई को आंध्र प्रदेश के श्रीहरिकोटा से लॉन्च किया गया था।

live**mint**

Mon, 02 Sep 2019

After final lunar orbit manoeuvre, ISRO readies for separation of lander

Bengaluru: ISRO on Sunday said it has successfully performed the fifth and final lunar bound orbit manoeuvre for the Chandrayaan 2 spacecraft and was gearing up for separation of the lander from the orbiter on September 2.

All spacecraft parameters are normal, the Bengaluru headquartered space agency said after Sunday's manoeuvre on the spacecraft, that is currently in the lunar orbit for its rendezvous with the Moon. "The final and fifth Lunar bound orbit manoeuvre for Chandrayaan-2 spacecraft was performed successfully today (September 01, 2019) beginning at 1821 hrs IST as planned, using the onboard propulsion system.

#ISRO

The final and fifth Lunar bound orbit maneuver for Chandrayaan-2 spacecraft was performed successfully today (September 01, 2019) at 1821 hrs IST.

For details please visit <https://t.co/0gic3srJx3pic.twitter.com/0Mlk4tbB3G>

— ISRO (@isro) September 1, 2019

The duration of the manoeuvre was 52 seconds. The orbit achieved is 119 km x 127 km," the Indian Space Research Organisation said in an update. It said the next operation is the separation of lander 'Vikram' from Chandrayaan-2 Orbiter, which is scheduled on September 2, 2019, between 1245 hrs and 1345 hrs (IST). Following this, there would be two deorbit manoeuvres of lander 'Vikram' to prepare for its landing in the south polar region of the moon. Vikram (with rover 'Pragyan' housed inside) is expected to touch down on the lunar surface on September 7, between 1.30 AM and 2.30 am.

ISRO said that after the lander's separation on Monday, two deorbit manoeuvres are scheduled for September 3 (9:00-10:00) and September 4 (3:00-4:00) respectively, before the powered descent on September 7.

ISRO Chairman K Sivan has said the proposed soft-landing on the Moon would be a "terrifying" moment as it is something ISRO has not done before, whereas the Lunar Orbit Insertion manoeuvre was successfully carried out during the Chandrayaan-1 mission. In a major milestone for India's second Moon mission, the Chandrayaan-2 spacecraft had successfully entered the lunar orbit on August 20 by performing the LOI maneuver.

Chandrayaan-2 satellite began its journey towards the moon, leaving the earth's orbit in the dark hours on August 14, after a crucial manoeuvre called Trans Lunar Insertion (TLI) carried out by ISRO to place the spacecraft on "Lunar Transfer Trajectory". India's Geosynchronous Satellite Launch Vehicle, GSLV MkIII-M1 had successfully launched the 3,840-kg Chandrayaan-2 spacecraft into the earth's orbit on July 22. The spacecraft's health is being continuously monitored from the Mission Operations Complex at ISRO Telemetry, Tracking and Command Network in Bengaluru with support from Indian Deep Space Network antennas at Bylalu, near Bengaluru, the space agency has said. Following the landing, the rover 'Pragyan' will roll out from lander 'Vikram' between 5:30-6:30 am on September 7 and carry out experiments on the lunar surface for a period of one lunar day, which is equal to 14 earth days.

The mission life of the lander is also one lunar day, while the orbiter will continue its mission for a year. The orbiter carries eight scientific payloads for mapping the lunar surface and study the exosphere (outer atmosphere) of the Moon while the lander carries three scientific payloads to conduct surface and subsurface science experiments. The rover carries two payloads to enhance the understanding of the lunar surface.

India's second lunar expedition would shed light on a completely unexplored section of the Moon, its South Polar region. ISRO has said that the mission objective of Chandrayaan-2 is to develop and demonstrate the key technologies for end-to-end lunar mission capability, including soft-landing and roving on the lunar surface.

On the science front, the mission aims to further expand the knowledge about the moon through a detailed study of its topography, mineralogy, surface chemical composition, thermo-physical characteristics and atmosphere, leading to a better understanding of the origin and evolution of the moon, the space agency had said.

<https://www.livemint.com/science/news/after-final-lunar-orbit-manoevre-isro-readies-for-separation-of-lander-1567350367128.html>



Mon, 02 Sep 2019

Russia to train four Indian astronauts for Gaganyaan

New Delhi taking Moscow's help for the maiden mission to space Gaganyaan

By Dinakar Peri

Moscow: India and Russia are stepping up cooperation in the space sector with Moscow extending help in 4-5 critical areas of India's ambitious manned mission to space, *Gaganyaan*. This includes training of Indian astronauts at Russian facilities beginning later this year, sources at the Indian Embassy in Moscow said.

“There are certain critical aspects India and Russia are cooperating. In some instances we are taking their help because they have huge experience in human space flight. There are some cases where Russia is helping us adapt their technology to Indian requirements. So it will essentially be an Indian spacecraft and this of course reduces time and the margins of error,” an embassy source told *The Hindu*.

Following Prime Minister Narendra Modi’s announcement on August 15, 2018 that an Indian will go to space by the 75th Independence Day, Indian Space Research Organisation (ISRO) has outlined a road map to put a three-man crew in a low earth orbit for 5-7 days by December 2021 by an indigenous GSLV Mk-III launch vehicle from a third launch pad under construction at Sriharikota.

Stating that the programme is on track and the process of astronaut selection will begin shortly, the source said that “towards the end of the year, by November or so we will have four Indian astronauts who will come here.”

“They will go through a 15-month training at the end of which further selection will be made. There will be further 6-8 months advanced training in India prior to the actual launch by end 2021,” the source stated.

Observing that the difference between space launches and human launches is that “space launches tend to aim for the optimum, human launches aim for perfection,” the source added that India sees Russia as a “reliable, long-term partner” with great experience in human space flight over the last 50 years.

“A special ISRO unit will be established in the embassy in Moscow to facilitate increased cooperation between India and Russia in view of the Gaganyaan programme,” the source added.

Space cooperation will be reviewed at the highest level during the summit meeting between Prime Minister Narendra Modi and Russian President Vladimir Putin later this week in Vladivostok.

The *Gaganyaan* programme is expected to cost under ₹ 10,000 crore and there will be two unmanned missions prior to the manned mission to validate the technologies.

ISRO Chairman Dr. K. Sivan had stated earlier that they began work on the manned mission in 2004 and many of the critical technologies required have already been validated through various tests.

(The writer was at MAKS air show on the invitation of the Russian Government)

<https://www.thehindu.com/news/national/russia-to-train-four-indian-astronauts-for-gaganyaan/article29316290.ece>

THE TIMES OF INDIA

Mon, 02 Sep 2019

‘Space lift’ to ferry astronauts from Earth to Moon?

Scientists have outlined a madcap plan to build an “elevator” between Earth and the Moon, claiming it could drastically reduce the cost of space travel.

Known as Spaceline, the elevator would consist of a giant lift shaft tethered to the surface of the Moon, which would dangle down into geostationary orbit around the Earth like a plumb bob. Astronauts lifting off in rockets from Earth would only need enough fuel to reach the end of the Spaceline, where they would be free from Earth’s gravity and atmospheric pressure.

After that they would latch onto a solar-powered shuttle, which would transport them the rest of the way to the Moon. The idea has been outlined by researchers from Columbia University and Cambridge University in a paper published to the preprint server ArXiv.

Using this so-called ‘spaceline’ would cut down on the rocket fuel needed for a trip between the Earth and Moon by a third. However, the journey in the elevator could take several days or even weeks, meaning that the elevator cars would need to be able to support humans during the long trip.

The traditional concept for a space elevator imagines a cable linking the Earth to a point directly above, stretching out beyond Earth’s geostationary orbit. However, at present, we are unable to create a cable strong enough to support its own weight. Instead, astrophysicists Zephyr Penoyre and Emily Sandford of the Columbia University in New York propose to build the elevator in the opposite direction, reaching out from orbit to the surface of the moon. This would avoid the challenging gravitational forces found close to the Earth.

“A cable which only hangs into Earth’s gravitational well need not be thick or massive,” Penoyre and Sandford have written in their draft paper. “The line becomes a piece of infrastructure, much like an early railroad,” said Penoyre. “The movement of people and supplies along it are much simpler and easier than the same journey in deep space.”

In the paper, the researchers claim that the elevator shaft could not be built from any existing material, because it would snap before it could be completed. The best material to use would be carbon nanotubes, the researchers claim, but these cannot yet be built to scale.

It would need to be extremely narrow at either end, so it didn’t collapse under gravitational pressure, but thickened at the middle to prevent snapping. The researchers have not yet addressed the risk of space debris in near-Earth orbit colliding with the lift shaft, but claim that there may be ways to protect it.

If the space elevator ever becomes a reality, the researchers envision it being used to transport people to orbital telescopes and other man-made structures located between the Earth and the Moon.

<https://timesofindia.indiatimes.com/home/science/space-lift-to-ferry-astronauts-from-earth-to-moon/articleshow/70941571.cms>