

# समाचार पत्रों से चयित अंश Newspapers Clippings

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## **DRDO developing new rifle launched grenade for forces**

*By Vijay Mohan*

Chandigarh: The Defence Research and Development Organisation (DRDO) is developing a new variant of a rifle-launched grenade having more advanced technical and safety features than the present generation of grenades.

The grenade, which has 40 mm caliber, can be launched from an “under-barrel launcher” (UBL) fixed to the fore of a standard issue rifle or from a multiple grenade launcher (MGL), a dedicated hand-held weapon used to fire grenades from a cylindrical magazine similar to that in a conventional revolver.

According to sources, the DRDO has invited the private industry to participate in its development and manufacturing. The project comes in the backdrop of the government identifying eight types of ammunition for manufacture by the private sector, including 40 mm grenades. According to reports, the Army has an annual requirement of about three lakh 40 mm grenades.

The grenade is being developed by the Armament Research and Development Establishment. At present, the Army is using two calibers of weapon-launched grenades. The 30 mm, which is fired from a heavy, tripod-mounted automatic grenade launcher, and the 40 mm variant that is fired from a UBL or MGL. Two types of UBLs—one designed by the DRDO is integrated with the rifle’s firing mechanism and a Russian variant that has its own trigger—are in use.

“Besides use of composite materials from the fabrication of the body of the new grenade, a major technological upgrade vis-à-vis the older grenades would be the use of advanced new generation fuses that trigger the detonation,” a DRDO scientist said. “Some additional reliability and safety features are also envisaged,” he added.

Recently, DRDO’s Chandigarh-based Terminal Ballistics Research Laboratory had developed advanced fuses for various kinds of service ordnance and warheads that are claimed to enhance the lethality, safety and reliability. A few years ago, it had also developed a hand-thrown grenade.

Grenades launched from a weapon give troops immense advantage in terms of enhancing their firepower, reach and accuracy as compared to handheld grenades. With weapon-launched grenades, targets such as troops, enemy posts and bunkers, vehicles and buildings can be engaged up to 400 metres.

### **Army’s annual requirement: 3 lakh**

- The 40 mm grenade can be launched from an ‘under-barrel launcher’ fixed to rifle or from a multiple grenade launcher
- The Army requires around 3 lakh 40 mm grenades annually

<https://www.tribuneindia.com/news/nation/drdo-developing-new-rifle-launched-grenade-for-forces/829870.html>



## HAL to receive 45,000 crore orders for 83 LCA fighters

- *The IAF had issued a tender for 83 LCAs about two years ago*
- *The project was stuck over the pricing issue as the government and the Air Force felt that the price offered by the HAL was slightly higher*

New Delhi: In a major boost for the indigenous defence manufacturing capability, the Indian Air Force (IAF) is expected to place orders worth around 45,000 crore with the Hindustan Aeronautics Limited (HAL) to acquire 83 Light Combat Aircraft (LCA) Tejas fighters.

The IAF had issued a tender for 83 LCAs about two years ago and the project was stuck over the pricing issue as the government and the Air Force felt that the price offered by the HAL was slightly higher.

"The cost committee of the Defence Ministry has determined the cost of the 83 LCA Mark 1A aircraft around ₹ 45,000 crore and the Indian Air Force is now expected to place orders for these planes in the next few weeks," senior defence sources told ANI.



The LCAs have been designed and developed completely by the Defence Research and Development Organisation (DRDO). Earlier this year, DRDO Chief G Satheesh Reddy had presented the Final Operational Clearance (IOC) certificate for the LCA to the IAF and the Defence Ministry at the Aero-India.

Sources said it would be the first-of-its-kind order for any Indian firm and would give major boost for the indigenous defence industry. More than 65 per cent funds of the ₹ 45,000 crore order would remain within the country and help in creating jobs in both private and public sectors.

The Acceptance of Necessity given by the Defence Ministry over two years ago was ₹ 50,000 crore but the price determined by the ministry's cost committee was reduced to around ₹ 45,000 crore.

The first LCA Mark 1A aircraft is likely to be produced by 2023 once the HAL is done with the supply of the initial 40 planes in the Initial Operational Clearance and Final Operational Clearance standards which have already taken part and proven themselves in the IAF operational exercises such as the Exercise Gagan Shakti.

LCA Mark 1A is the advanced version of Tejas aircraft.

As per the requirements presented by the IAF, the first LCA Mark 1A plane would be supplied in 36 months from the signing of the contract. The new LCA Mark 1A plane will have advanced avionics and radars than the initial 40 LCAs being supplied to the Air Force.

The HAL has so far supplied 16 LCAs to the service which has based them at Suler in Tamil Nadu under 45 Squadron.

<https://www.livemint.com/news/india/hal-to-receive-rs-45-000-crore-orders-for-83-lca-fighters-1567775983704.html>

## **DRDO Chairman calls Chandrayaan 2 a very complex mission, lauds PM Narendra Modi for backing ISRO scientists**

*The DRDO chief said that PM Narendra Modi's hug and encouragement boosted the morale of ISRO scientists who were left heartbroken due to the last mile glitch in a hugely successful mission*

*By Tanweer Azam*

New Delhi: Defence Research and Development Organisation (DRDO) chairman Dr G Satheesh Reddy on Sunday lauded Prime Minister Narendra Modi for hugging and consoling ISRO chief Dr K Sivan after the latter broke down minutes after Chandrayaan 2's Vikram Lander lost contact with ISRO Command Centre in Bengaluru. The DRDO chief said that PM Modi's hug and encouragement boosted the morale of ISRO scientists who were left heartbroken due to the last mile glitch in a hugely successful mission.

Dr G Satheesh Reddy, Chairman of Defence Research & Development Organisation, on PM hugged & consoled ISRO Chief K Sivan after he(Sivan) broke down following #Chandrayaan2Landing: It's a great gesture by PM. It's great morale booster for scientists who saw last mile glitch in mission pic.twitter.com/Q8abhjONhL

— ANI (@ANI) September 8, 2019

"It's a great gesture by PM. It's great morale booster for scientists who saw the last mile glitch in mission," DRDO chief told ANI. Dr Reddy added that it seems that PM's gesture motivated ISRO scientists to again work on the mission and they started finding out the reason which caused the loss of communication between Vikram Lander and ISRO. "I think, after that gesture, ISRO scientists again started working on the mission, started looking for what actually happened; that's how they could locate the rover also," noted the DRDO chief.

Dr G Satheesh Reddy, Chairman of Defence Research & Development Organisation (DRDO): I think, after that gesture, ISRO scientists again started working on the mission, started looking for what actually happened & that's how they could locate the rover also.

#Chandrayaan2 <https://t.co/AC9KqRBrzK>

— ANI (@ANI) September 8, 2019

Dr Reddy also slammed Pakistani leaders for making fun of ISRO's mission and said that they are unaware of the complexity of the mission and these people have not got the basic courtesy to appreciate missions of such magnitude. "The people who haven't done anything of this class I don't think they can appreciate and probably they cannot understand the complexity of this mission," said Dr Reddy.

Dr G. Satheesh Reddy, Chairman of DRDO, on Pakistani ministers trying to ridicule Indian space programme: The people who haven't done anything of this class I don't think they can appreciate and probably they cannot understand the complexity of this mission.

#Chandrayaan2 pic.twitter.com/Cz1N64TgkE

— ANI (@ANI) September 8, 2019

Calling Chandrayaan 2 a very complex mission, the DRDO chairman said that only those who have undertaken such missions will be able to appreciate the scientists who are involved in these missions.

"Chandrayaan 2 is a very complex mission. This type of a complex mission can be appreciated by those people who have also taken up such missions," he noted.

Earlier on Sunday, Indian Space Research Organisation (ISRO) chief had said that the location of Chandrayaan-2's Vikram Lander, which had lost contact with the space agency 2.1 km above the Moon's surface, has been found. The ISRO chief, however, added that communication with Vikram Lander was yet to be established.

"We have found the location of Vikram Lander on lunar surface and orbiter has clicked a thermal image of Lander. But there is no communication yet. We are trying to have contact. It will be communicated soon," said Sivan.

<https://zeenews.india.com/india/drdo-chairman-calls-chandrayaan-2-a-very-complex-mission-lauds-pm-narendra-modi-for-backing-isro-scientists-2233133.html>



Mon, 09 Sep 2019

## **DRDO Chief slams Pakistan ministers for mocking Chandrayaan-2**

*Pakistan's Science and Technology Minister Fawad Chaudhry  
had posted a series of tweets using the hashtag "India Failed"*

New Delhi: Defence Research and Development Organisation (DRDO) Chairman G Satheesh Reddy on Sunday hit out at Pakistani ministers for trying to ridicule Indian Space Research Organisation's (ISRO) Chandrayaan-2 Moon mission.

"I don't think the people who haven't done anything of this class can appreciate or understand the complexity of this mission. Chandrayaan-2 is a very complex mission. This type of complex mission can be appreciated by those people who have also taken up such missions," G Satheesh Reddy said.

It comes after Pakistan's Science and Technology Minister Fawad Chaudhry posted a series of tweets using the hashtag "India Failed" after ISRO lost contact with its Vikram lander.

The soft-landing of Chandrayaan-2's landing module, Vikram, did not go according to plan as all ground communication was lost with it just moments before the scheduled landing late on September 7.

The landing began minutes before 1:40 am Saturday, and then things went awry around 12 minutes after Vikram lander began its descent.

G Satheesh Reddy also praised PM Narendra Modi for hugging and consoling ISRO Chief K Sivan after he (Sivan) broke down after communication was lost with the Chandrayaan-2 lander.

G Satheesh Reddy said, "It's a great gesture by the prime minister. It's a great morale booster for scientists who saw the last-mile glitch in mission."

"I think, after that gesture, ISRO scientists have again started working on the mission, started looking for what actually happened and that's how they could locate the rover Pragyan also," G Satheesh Reddy said.

<https://www.indiatoday.in/science/chandrayaan-2-mission/story/drdo-chief-slams-pakistan-ministers-for-mocking-chandrayaan-2-1596976-2019-09-08>

## "Indian base on Moon in 10 years", says scientist who led BrahMos project

*Helium-3 will be the new energy material for future, former DRDO scientist A Sivathanu Pillai said*

New Delhi: A former scientist of the Defence Research and Development Organisation has said India will be able to set up a base on the moon in 10 years to extract helium-3.

"In space programme, we are one of the four countries that completed mastery over technology," former DRDO scientist A Sivathanu Pillai told DD News.

"India will be able to set up a factory on the moon to process huge reserves of precious raw material and bring the extracted helium-3 to Earth," said Mr Pillai, who spearheaded the BrahMos missile programme.



Helium-3 will be the new energy material for future, he said. Helium-3 is a non-radioactive material that can produce 100 times more energy than uranium.

Mr Pillai said India's base on the moon will also "become a hub for future launches" for missions to other planets in the solar system.

"Now, there are interests from the US, Russia and China to create base on the moon, India will naturally follow," he added.

<https://www.ndtv.com/india-news/indian-base-on-moon-in-10-years-says-former-drdo-scientist-a-sivathanu-pillai-who-led-brahmos-projec-2097680>

## Defence Talk | Apache helicopters for IAF are good products wrapped up in a bad package

*The AH-64 is great, but, why does the Indian Air Force feel the need for four types of attack helicopters? It shows a fundamentally muddled mind and a severe myopia of higher defence planning*

**By Abhijit Iyer-Mitra**

Antony Joseph, distinguished scientist and programme director, Advanced Naval System Programme, Defence Research Development Organisation (DRDO), participated in the annual school exhibition organised by The Hyderabad Public School, Begumpet.

The Induction of the AH-64 Apache to the Indian Air Force (and later into the army) will revolutionise the way India fights. Will it though? Yes and no; the yes lies in the equipment and the no lies in everything that surrounds and feeds into it.

What will the AH-64 change — or rather what's so good about it? For starters, the helicopter is closest an air asset comes to being indestructible. It has a record for flying for almost 30 minutes, gliding to a safe location even after its engine was taken out.

In the publicity images released you see two black ‘whiskers’ sticking out on either side of the cockpit. These are the directed infrared counter measures — essentially a laser gun that takes out optically-guided missiles. This is important because at the low altitude that attack helicopters fly, it is impossible to track them on radar till they're within visual range. Usually the missile used against them are shoulder-fired missiles that use optical/infrared guidance. Firing a laser beam into the seeker of these missiles means they're no longer able to track the helicopter. Russian helicopters in Afghanistan were shot down by exactly these kinds of shoulder-fired missiles, and some of the helicopters we lost during the Kargil War were also brought down by similar missiles.

Clearly, as far as defence of the platform goes, be it armour, or redundancy in being able to fly to safety or take out shoulder-fired infrared missiles, the Apache is top notch.

The second aspect is offence. The normal variant of the Apache came with the optically-guided hellfire missile: a great missile that could cut through clutter and hit a target. However, as infrared defences similar to that the Apache uses to protect itself have started to find their way onto ground targets, the hellfire can easily be confused. Moreover, being visually-guided, it can't be used in heavy fog and or bad weather. This is where the Apache comes in.

Half of the Indian helicopters have the longbow radar — an ovoid construction atop the mast. This interfaces with the optical and infrared sensors on the ‘wart’ on the Apaches chin. What the helicopters computer does is it fuses all the three images: radar, optical and infrared, and cues this to the latest version of the Hellfire L variant, which can be guided by any of these three input methods. This is crucial, because each sensor picks up something the other sensors cannot. In effect, it means the adversary has no place to hide and the countermeasures it deploys can be overcome. For example, an infrared countermeasure can blind optical or infrared missiles, but it cannot blind a radar-guided missile.

The third aspect is how these helicopters will be used. In 2005, Israel saw a bruising debate where proponents of airpower contended that helicopters were obsolete. Their argument was that stealth technology made the need for self-defence redundant, and hence new planes such as the F-35 would not need to fly under the horizon to avoid radar. At the same time, precision munitions, which could detect targets and be fired from great distances, had significantly reduced the need for a slow flying platform like a helicopter.

In India, however, the reality is quite different. We do not have stealth aircraft, leave alone being able to decide on a light single-seat plane, while inducting a ruinously expensive two-seat Rafale, essentially to compensate for the failure of the Sukhoi. In such circumstances, Indian Apaches will have to do what US Apaches did in the opening stages of Operation Desert Storm in 1991, fly under the radar and take out a radar array on the Iraqi side, before going berserk and taking out Iraqi armour.

All up, the Ah-64 is great; the problem, however, is why the Indian Air Force feels it needs four types of attack helicopters. When the Apache is inducted, the Indian Air Force will continue to fly its venerable (and vulnerable) Mi-35 — the Mi-35 is a variant of the Mi-24 which were shot down like flies by the Mujahedeen in Afghanistan. It will also be inducting the Hindustan Aeronautics Limited (HAL)-made Light Combat Helicopter and an armed version of the ALH called Rudra.

Each of these procurements show a fundamentally muddled mind. First that the Indian Air Force doesn't want to get rid of obsolete old assets; second that Indian aircraft that fulfil the same role simply aren't good enough, their survivability being abysmal; third that they will not buy a foreign product in high enough quantities to create economies of scale or enable deep technology transfer.

In short, this is a good product wrapped up in a bad package, which simultaneously highlights both the opportunities of new weapons, but also the severe myopia of higher defence planning within the Indian Air Force.

<https://www.moneycontrol.com/news/economy/policy/defence-talk-apache-helicopters-for-iaf-are-good-products-wrapped-up-in-a-bad-package-4410551.html>

## HAL-built trainer aircraft HTT-40 clears crucial flight test successfully

*Clearing the HTT-40's six-turn spin tests removes a monkey from our backs, said design chief Arup Chatterjee*

*By Ajai Shukla*

New Delhi: Hindustan Aeronautics (HAL) has underlined its growing capability to design and develop fixed-wing aircraft by steering its home grown Hindustan Turbo Trainer-40 (HTT-40) basic trainer to the brink of final flight clearance.

In flight-testing on Saturday in Bengaluru, HAL's test pilots threw the HTT-40 into multiple spins and, each time, the trainer returned to level flight smoothly. In so doing, the HTT-40 cleared the so-called "six-turn spin test", regarded as the ultimate and most difficult test for a trainer aircraft.

The HTT-40 has already met and, in many aspects of flight performance, surpassed the so-called "Air Staff Qualitative Requirements" (ASQRs), which lists out the flight performance — speed, turn, ceiling, etc. — that the IAF demands from an aircraft.

Since 2012, the Indian Air Force (IAF) has consistently opposed the HTT-40, first pressuring the Ministry of Defence (MoD) into importing 75 Pilatus PC-7 Mark II basic trainers from Switzerland, and then demanding more imports because HAL would allegedly never be able to steer the HTT-40 through all its tests. "There is no need for [the HTT-40 trainer]", then IAF boss, Air Chief Marshal NAK Browne, had dismissively stated at the Aero India show in 2013. "We have the Pilatus PC-7. It's a proven aircraft. The project HAL plans is from scratch. Our indications are that the cost will be too high. There is no need for all this." Each successive IAF chief followed the same line, criticizing the HTT-40, while demanding more Pilatus imports.

As *Business Standard* reported (June 10, 2019, "IAF block on indigenous HTT-40 trainer aircraft keeps door open for Swiss trainers") the current IAF chief refused to even issue a tender for the HTT-40, which was needed to procure engines for the production aircraft. The IAF stated it would only do so after the HTT-40 cleared the six-turn spin tests. HAL has responded to IAF opposition with defiance. Successive HAL chiefs backed the HTT-40, committing Rs 350 crore of internal HAL funds to the project. A team of young, talented HAL designers have worked without IAF assistance or funding, backed to the hilt by former defence ministers, A K Antony and Manohar Parrikar.

For the Pilatus PC-7 Mark II trainer, the procurement of which is already under the scanner of the Central Bureau of Investigation, this most likely spells the end of further imports. The HTT-40 falls under the category of "Indian designed, developed and manufactured" (IDDM) equipment, and the MoD cannot import more Pilatus without a detailed explanation of why the HTT-40 is being ignored.

"For HAL, clearing the HTT-40's six-turn spin tests removes a monkey from our backs. Our intermediate jet trainer (IJT) aircraft had failed its spin tests and we were determined this would not be the fate of the HTT-40. In fact, not just has the HTT-40 cleared its spin and stall tests, we have revived the IJT project as well," said HAL's design chief, Arup Chatterjee.

HAL has manufactured the IAF's fleet of Hawk advanced jet trainers (AJT), with technology from BAE Systems. With the HTT-40 poised for final clearance, a breakthrough on the IJT could mean that the IAF's entire training aircraft fleet comprises of HAL-built aircraft.

[https://www.business-standard.com/article/companies/hal-built-trainer-aircraft-htt-40-clears-crucial-flight-test-successfully-119090700956\\_1.html](https://www.business-standard.com/article/companies/hal-built-trainer-aircraft-htt-40-clears-crucial-flight-test-successfully-119090700956_1.html)

## **Pakistan fighters in biggest ‘real-combat level’ drill with China months after post-Balakot dogfight with India**

*The 15-day drill was the biggest joint air force exercise involving the Chinese and fighter aircrafts from a foreign country, the Chinese military said it was the most comprehensive in terms of equipment used and involved the most “complete combat unit”*

*By Sutirtho Patranobis*

Beijing: More than 50 Chinese and Pakistani fighter aircrafts completed the most comprehensive and “confrontational” two-week long joint exercises in northwestern China on Friday, a drill described by a military observer as “real-combat level”.

The 15-day drill was the biggest joint air force exercise involving the Chinese and fighter aircrafts from a foreign country, the Chinese military said, adding it was also the most comprehensive in terms of equipment used and involved the most “complete combat unit”.

The large-scale Sino-Pak air exercise was held at an undisclosed location in northwestern China months after Indian and Pakistani air forces engaged in a dogfight near the Line of Control following Indian air strikes on terror camps in Pakistan’s Balakot.

The annual joint training drill code-named “Shaheen (Eagle) VIII” was kicked off on August 23 and ended Friday with both sides practicing “...air superiority, suppression of ground targets, air attack and joint air defense training,” a Chinese air force statement carried by news website Thepaper.cn said.

Though an annual drill, this edition was the most comprehensive ever.

“This joint training has realised the integration and unification of all forces and various types of troops....They (the personnel) feel that the two sides are constantly working together, the command planning capability is getting stronger and stronger, and the actual combat atmosphere is more intense,” the statement said.

The People’s Liberation Army Air Force dispatched J-10C, J-16 and early warning aircraft as well as ground detachments covering ground-to-air missile, radar, airborne landing and communication to join the training; the Pakistani air force dispatched multiple types of aircraft, including the JF-17 Thunder, Mirage and early warning aircraft. The air arm of the PLA Navy also deployed aircraft to the joint training.

“Pakistan dispatched the JF-17 Thunder and Mirage fighter jets, early warning aircraft and other ground troops, which was a mini version of the Pakistani air force given the types of weapons and equipment and number of services,” Senior Colonel Du Wenlong told China military online.

“Based on the training progress so far, the Pakistani side has rich real-combat experience, while the Chinese side boasts advanced weapon and equipment systems and various cutting-edge technologies,” Du said.

The biggest feature of this edition was that neither side was informed of the other’s situation during the exercise and had to adapt, for example, with the help of early warning aircraft.

The training was more confrontational than previous ones that followed a pre-arranged plan and was carried out in complicated environment where the troops were expected to overcome the impact of natural condition, Du said.

“Shaheen (eagle) VIII joint training features a keener sense of unfamiliarity and is very close to real-combat environment, with its indicators and plans all reaching the real-combat level,” Du said.

China and Pakistan have snug defence ties and they have begun upgrading their jointly developed JF-17 fighter jet.

<https://www.hindustantimes.com/world-news/pakistan-air-force-holds-real-combat-level-exercises-with-china-months-after-post-balakot-dogfight-with-india/story-4oBtIhAMjaSUmWCPfnGYTO.html>

# THE ECONOMIC TIMES

Mon, 09 Sep 2019

## Pakistan-China Gwadar Port runs into rough weather

*Chinese co terminates container liner services to Gwadar; inadequate cargo & lack of use of port for transit to Afghanistan cited as reasons*

*By Dipanjan Roy Chaudhury*

New Delhi: Pakistan's Gwadar Port, built and managed by China, has run into rough weather due to inadequate cargo handled at the port and lack of use of port for transit to Afghanistan casting a shadow over Beijing's Belt and Road Initiative (BRI) in the region.

China's COSCO Shipping Lines recently terminated its container liner services between Karachi and Gwadar due to slow construction of Gwadar Free Trade Zone leading to insufficient pick up in export and import volume at the port terminal, ET has learnt.

Insufficient functioning of Gwadar customs, high inland shipping cost and non-acceptance of transit items by the Karachi Port have further contributed to the decision by COSCO, ET has learnt. COSCO has alleged that inadequate policies and measures in Pakistan had seriously impacted market development and yield of COSCO's Gwadar service, according to persons familiar with situation at Gwadar port.

Port operator Gwadar International Terminal Limited, the subsidy of China Overseas Port Holdings Corporation (COPHC), had also expressed disappointment to the Pak federal authorities over the recent developments, ET has reliably learnt.

The Karachi-Gwadar services launched as first container liner service at Gwadar Port in March 2018 was strategised to target the untapped market of coastal trade between sea ports in Pakistan, apart from eyeing Afghanistan transit trade. However, Chabahar port in Iran, and not Gwadar, has emerged as gateway to landlocked Afghanistan. India is helping expand and manage Chabahar port.

The Gwadar port container liner service was launched to improve maritime trade of sea-food, fruit, vegetables, marbles and minerals that did not materialise and had been facing difficulties since its launch, according to a person who follows the functioning of the Gwadar port.

**HITTING HURDLES**

Insufficient functioning of Gwadar customs, high inland shipping cost and non-acceptance of transit items by the Karachi Port have further contributed to the decision by COSCO

The Chinese subsidised Gwadar container service was largely used to load and unload CPEC related construction equipment, machinery and other cargo.

The Gwadar port container liner service was launched to improve maritime trade of sea-food, fruit, vegetables, marbles and minerals

The Karachi-Gwadar services was strategised to target the untapped market of coastal trade between sea ports in Pakistan, apart from eyeing Afghanistan transit trade

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The container liner service was heavily subsidised by COPHC for weekly vessel calls at Gwadar. Without much cargo and few containers being loaded, COSCO has now quit the Gwadar services for lack of economic feasibility, claimed the person quoted above earlier. COPHC has conveyed to the Pak authorities that it would be impossible to restart a new liner services within Pakistani ports.

The Chinese subsidised Gwadar container service was largely used to load and unload CPEC related construction equipment, machinery and other cargo. It has been learnt that China has warned Pakistan that the developments will adversely impact China Pakistan Economic Corridor as Gwadar is the jewel in crown of CPEC -- the key pillar of BRI in South Asia.

<https://economictimes.indiatimes.com/news/international/world-news/pakistan-china-gwadar-port-runs-into-rough-weather/articleshow/71041565.cms>



Sat, 07 Sep 2019

## India, South Korea seal logistics pact

*MoU to extend logistical support to each other's Navies signed*

New Delhi: India and South Korea concluded a military logistics agreement during the ongoing visit of Defence Minister Rajnath Singh to Seoul. The two countries also formulated a forward-looking road map to take bilateral defence industry cooperation to the next level, the Defence Ministry said in a statement on Friday.

“The Ministers exchanged views on regional and international developments of mutual interest. Two MoUs to further defence educational exchanges and extend logistical support to each other’s Navies were signed,” the statement said on the talks between Mr. Singh and his South Korean counterpart Jeong Kyeong-doo.

A defence source said this foreign cooperation initiative would greatly help interoperability.

“India will be able to get assured logistic support when it operates in the Indo-Pacific in the ports of South Korea.” Such agreements extend the reach, presence and sustainability of Navy ships when deployed at great distances from home ports, the source added.

On the road map, Mr. Singh said it had listed a number of proposed areas of cooperation in land, aero and naval systems, research and development cooperation and collaboration in testing, certification and quality assurance.

Mr. Singh also invited the South Korean industry to explore the feasibility of local production of items, used in main weapon systems imported by Defence public sector undertakings (PSUs).

<https://www.thehindu.com/news/national/india-south-korea-seal-logistics-pact/article29354781.ece>

## Nation's support, PM Modi's address boosted our morale, says ISRO Chief Sivan

*“We are extremely happy [with PM's address as well as nation rallying behind ISRO]. It has boosted the morale of our people,” Mr. Sivan told PTI*

Bengaluru: Prime Minister Narendra Modi's address and outpouring of support and kind words for ISRO after the unsuccessful bid by Chandrayaan-2's Vikram module to touch-down on the lunar surface have boosted the morale of its scientists, space agency's chairman K. Sivan said on September 8.

“We are extremely happy [with PM's address as well as nation rallying behind ISRO]. It has boosted the morale of our people,” Mr. Sivan told *PTI*.

Former ISRO chairman K. Kasturirangan praised the Prime Minister for inspiring, encouraging and reassuring Mr. Sivan and ISRO team and fully backing them.

“We are so touched. The country has given a good, positive response. PM was incredible yesterday.” he told *PTI*.

“The way he [PM] conveyed it... so passionate... so emotional and sometimes rich with meanings and positive responses. I think we could not have expected anything better. Fantastic,” he said.

Another former ISRO chief A.S. Kiran Kumar said, “We are definitely grateful to the nation and the PM.”

There are hundreds and thousands of variations that were possible for the soft-landing mission, indicating the complexities, he said.

“We appreciate that the country and people were able to actually take note of this and continue to give their support. So, it's very positive. We are grateful to the entire country,” he added.

In his address, the Prime Minister asked ISRO scientists not to get disheartened by the setback in the soft-landing mission and asserted that there would be a “new dawn and brighter tomorrow” very soon.

The Prime Minister on September 7 gave a long and tight hug to an emotional Mr. Sivan, who was in tears, unable to come to terms over lander Vikram's unsuccessful bid to soft-land on the moon.

The video of Mr. Modi hugging Mr. Sivan has gone viral on social media with netizens dubbing it as the hug of over a billion Indians and heaping praises on both.

<https://www.thehindu.com/news/national/nations-support-pm-modis-address-boosted-our-morale-isro-chief/article29367932.ece>

## Chandrayaan-2: चांद पर ISRO ने खोज निकाला विक्रम लैंडर, संपर्क साधने की कोशिश

चंद्रयान-2 के ऑर्बिटर में लगे ऑप्टिकल हाई रिजोल्यूशन कैमरा (OHRC) ने विक्रम लैंडर की तस्वीर ली है। इसमें विक्रम लैंडर सॉफ्ट लैंडिंग वाली तय जगह से 500 मीटर दूर सिर के बल गिरा पड़ा है।

- वैज्ञानिक ऑर्बिटर के जरिए विक्रम लैंडर को संदेश भेजने की कोशिश कर रहे हैं
- डेटा एनालिसिस के बाद पता चलेगा कि विक्रम लैंडर और प्रज्ञान रोवर कितना काम करेंगे

नई दिल्ली: इसरो (ISRO) को चांद पर विक्रम लैंडर की स्थिति का पता चल गया है। ऑर्बिटर ने थर्मल इमेज कैमरा से उसकी तस्वीर ली है। हालांकि, उससे अभी कोई संचार स्थापित नहीं हो पाया है। ये भी खबर है कि विक्रम लैंडर लैंडिंग वाली तय जगह से 500 मीटर दूर पड़ा है। चंद्रयान-2 के ऑर्बिटर में लगे ऑप्टिकल हाई रिजोल्यूशन कैमरा (OHRC) ने विक्रम लैंडर की तस्वीर ली है।

अब इसरो वैज्ञानिक ऑर्बिटर के जरिए विक्रम लैंडर को संदेश भेजने की कोशिश कर रहे हैं ताकि, उसका कम्युनिकेशन सिस्टम ऑन किया जा सके। इसरो के विश्वस्त सूत्रों ने aajtak.in को बताया कि बेंगलुरु स्थित इसरो सेंटर से लगातार विक्रम लैंडर और ऑर्बिटर को संदेश भेजा जा रहा है ताकि कम्युनिकेशन शुरू किया जा सके। इसरो प्रमुख के सिवन ने बताया कि हमें विक्रम लैंडर के बारे में पता चला है, वह चांद की सतह पर देखा गया है। ऑर्बिटर ने लैंडर की एक थर्मल पिक्चर ली है। लेकिन अभी तक कोई संचार स्थापित नहीं हो पाया है। हम संपर्क करने की कोशिश कर रहे हैं।

Indian Space Research Organisation (ISRO) Chief, K Sivan to ANI: We've found the location of #VikramLander on lunar surface&orbiter has clicked a thermal image of Lander. But there is no communication yet. We are trying to have contact. It will be communicated soon. #Chandrayaan2 pic.twitter.com/1MbIL0VQCo

ANI (@ANI) September 8, 2019

भविष्य में विक्रम लैंडर और प्रज्ञान रोवर कितना काम करेंगे, इसका तो डेटा एनालिसिस के बाद ही पता चलेगा। इसरो वैज्ञानिक अभी यह पता कर रहे हैं कि चांद की सतह से 2.1 किमी ऊंचाई पर विक्रम अपने तय मार्ग से क्यों भटका। इसकी एक वजह ये भी हो सकती है कि विक्रम लैंडर के साइड में लगे छोटे-छोटे 4 स्टीयरिंग इंजनों में से किसी एक ने काम न किया हो। इसकी वजह से विक्रम लैंडर अपने तय मार्ग से डेविएट हो गया। यहीं से सारी समस्या शुरू हुई, इसलिए वैज्ञानिक इसी प्वाइंट की स्टडी कर रहे हैं।

इसके अलावा चांद के चारों तरफ चक्कर लगा रहे ऑर्बिटर में लगे ऑप्टिकल हाई रिजोल्यूशन कैमरा (OHRC) से विक्रम लैंडर की तस्वीर ली जाएगी। यह कैमरा चांद की सतह पर 0.3 मीटर यानी 1.08 फीट तक की ऊंचाई वाली किसी भी चीज की स्पष्ट तस्वीर ले सकता है।

<https://aajtak.intoday.in/story/chandrayaan-2-vikram-lander-found-on-moon-surface-isro-good-news-1-1117705.html>

## Chandrayaan 2 lander located on Moon's surface, Says ISRO Chief: Report

*Chandrayaan 2 Vikram lander: India had expected to make space history with the Rs. 1,000-crore Chandrayaan 2 mission. A successful soft landing on the moon would have made the country only the fourth - after the United States, Russia and China - to achieve the feat*

### Highlights

- *Chandrayaan 2 lunar lander Vikram has been located on moon's surface*
- *ISRO ground station is working to establish contact*
- *Lunar orbiter took a thermal image of the lander, says ISRO chief*

Bengaluru / New Delhi: Chandrayaan 2 lunar lander Vikram has been located on the moon's surface and the ground station is working to establish contact, news agency PTI quoted ISRO chief K Sivan as saying today. ISRO had lost contact with Vikram, one of three components of the Chandrayaan 2 spacecraft, on Saturday morning while the lander was attempting a historic soft landing near the south pole of the moon. The lander stopped transmitting just 2.1 kilometres from the moon's surface.

"Yes, we have located the lander on the Lunar surface. It must have been a hard-landing," Dr Sivan said, adding that it was unclear at this stage if the lander had been damaged.

News agency ANI quoted Dr Sivan as saying the lunar orbiter had taken a thermal image of the lander.

"... orbiter has clicked a thermal image of Lander. But there is no communication yet. We are trying to have contact. It will be communicated soon," he was quoted as saying.

Indian Space Research Organisation (ISRO) Chief, K Sivan to ANI: We've found the location of #VikramLander on lunar surface&orbiter has clicked a thermal image of Lander. But there is no communication yet. We are trying to have contact. It will be communicated soon. #Chandrayaan2pic.twitter.com/1MbIL0VQCo

— ANI (@ANI) September 8, 2019

As ISRO works to restore communications with Vikram, a senior official was quoted by PTI as saying it was "less and less probable" to link up with the lander.

Another official said the prospect of a "hard-landing" could mean Vikram, which was designed for a soft landing, may not have the "right orientation" because it may not have landed on its four legs.

India had expected to make space history with the Rs. 1,000-crore Chandrayaan 2 mission. A successful soft landing on the moon's surface would have made the country only the fourth - after the United States, Russia and China - to achieve the feat.

It would also have made India the first country to complete a soft landing near the South Pole on its first attempt.

In a statement to national broadcaster Doordarshan on Saturday, Dr Sivan had blamed faulty execution of the last stage of the operation for the loss of communication.

"The last part of the operation was not executed in the right manner. It was in that phase that we lost link with the lander, and could not establish contact subsequently," he said.

The ISRO chief had earlier said the final minutes of the soft landing were the most tricky, calling them "15 minutes of terror".

"This is a very complex process and it is new for us. It is a complex process even for those who have already done it. We are doing this for the first time, so it will be fifteen minutes of terror for us," he said.

Vikram and lunar rover Pragyan, which is housed inside the lander, were scheduled to operate for one lunar day (equal to 14 Earth days) and carry out a series of surface and sub-surface experiments.

The lunar orbiter, which is in orbit around the moon, is now expected to be operational for seven years and help in the understanding of the moon's evolution, mapping of its minerals and water molecules in polar regions.

Chandrayaan 2 was launched on July 22 from Sriharikota in Andhra Pradesh, on the back of a GSLV Mark III rocket - ISRO's largest and most powerful. The mission was originally scheduled to launch on July 15 but that was aborted, with less than an hour remaining, after a technical glitch was discovered.

On August 20 the spacecraft was successfully inserted into lunar orbit and, at 1.15 pm on Monday, Vikram separated from the orbiter, entering a descending orbit around the moon. (*With input from PTI, ANI*)

<https://www.ndtv.com/india-news/chandrayaan-2-lander-located-on-moons-surface-trying-to-have-contact-says-isro-chief-dr-k-sivan-news-2097522>



Sun, 08 Sep 2019

## 95% of mission targets met: Scientific adviser

*VijayRaghavan says Orbiter will continue to provide rich data, improve understanding of Moon's evolution*

New Delhi: The loss of Vikram lander left a deep sense of disappointment, yet up to 95 per cent of the Chandrayaan-2 Mission objectives have been met and the Orbiter placed in its intended orbit around the Moon will continue to provide rich data, Principal Scientific Adviser to Government of India K VijayRaghavan has said.

"Success criteria were defined for each and every phase of the mission and so far 90 to 95 per cent of the mission objectives have been accomplished and will continue to contribute to lunar science, notwithstanding, the loss of communication with the lander," Prof VijayRaghavan said in a series of tweets explaining how data to be generated by the Orbiter will enrich the space community.

Orbiter has already been placed in its intended orbit around the Moon and shall enrich our understanding of the moon's evolution, map minerals, water molecules in the polar regions, using its eight state-of-the-art scientific instruments.

The lander followed the planned descent trajectory from its orbit of 35 km to just below 2 km above the surface. All systems and sensors of the lander functioned excellently until this point. It tested and proved many new technologies, such as the variable thrust propulsion technology, used in the lander.

The project review teams made presentations to mission management, Chaired by ISRO Chairman Dr K Sivan till early hours, and are already addressing causes and learning from the events, he said, underscoring "After a moment of despondency, it is back to work! It is inspirational to see this characteristic of science in collective action. Kudos to ISRO".

The PSA said since the launch of Chandrayaan-2 on July 22, India and the world watched its progress from one phase to the next with great expectation and excitement. The mission, he said, is very complex, and a significant technological leap from previous missions of ISRO.

This unique mission brought together an orbiter, lander and rover to explore the unexplored south polar region of the Moon. It was aimed at studying not just one area of the Moon but also its exosphere, the surface and sub-surface in a single mission. The precise launch and mission management has ensured a long life of almost seven years instead of the planned one year.

Cutting-edge science will come from the Orbiter that has a camera of highest resolution in any lunar mission and already began providing images that will be immensely useful for global scientific community. Its objective is to map the lunar surface and data will give clues about the Moon's evolution, prepare 3D maps of lunar surface.

The X-ray fluorescence spectra on board is to detect elements like magnesium, aluminium, silicon, calcium, titanium, iron, and sodium while through another technique it will detect these elements by measuring the characteristic X-rays they emit when excited by the Sun's rays.

### **Significant technological leap**

Since the launch of Chandrayaan-2 on July 22, India and the world watched its progress from one phase to the next with great expectation and excitement. The mission is very complex and a significant technological leap from previous missions of ISRO. — K VijayRaghavan, Principal scientific adviser <https://www.tribuneindia.com/news/nation/95-of-mission-targets-met-scientific-adviser/829429.html>



*Sun, 08 Sep 2019*

## **Won't impact future missions: ISRO official**

New Delhi / Mumbai: The Chandrayaan-2 mission will “absolutely have no impact” on ISRO's ambitious manned mission Gaganyaan, scheduled to be launched in 2022, according to an ISRO official.

PG Diwakar, who was earlier scientific secretary at the space agency and is now the Director of Earth Observations Applications and Disaster Management Programme Office at the ISRO headquarters in Bengaluru, said both Chandrayaan and Gaganyaan have different objectives and dimensions.

“There will be absolutely no problem at all. It will have no impact. The satellite missions as well as the human space flight mission will go very smoothly without any problem. Each mission is of a different type,” he told PTI.

Diwakar, however, declined to comment on the reasons behind the glitches faced during the landing of Chandrayaan-2. The lander Vikram lost contact, just 2.1 kilometers above the lunar surface.

The ISRO plans to send three Indians to space by 2022, an announcement made by Prime Minister Narendra Modi during his last Independence Day speech. Besides this, the ISRO will also launch Aditya L-1, India's first solar mission, by next year.

There are plans to build a space station and launch interplanetary missions to Mars and Venus. Diwakar said Chandrayaan had its own challenges while the other missions will have different objectives.

While Chandrayaan-2 was meant for soft-landing of Vikram on the lunar surface, Gaganyaan's mandate will be to send the astronauts to space and bring them back to earth safely.

Prime Minister Narendra Modi said the Isro scientists will be undeterred by the setback on the Chandrayaan-2 mission, and asserted the nation will achieve its goal of reaching the moon.

Modi was speaking hours after the Vikram lander of the Chandrayaan-2 mission lost communication contact with the ground centre in the wee hours of Saturday in Bengaluru, a moment

he personally witnessed. He said the ISRO scientists have a very strong spirit of working and will not rest till the objective is met.

“The dream of reaching the moon will be accomplished ISRO and those working with it won’t stop, get tired or sit down,” Modi said, speaking at an event in Mumbai in the day.

Modi said the scientists are not the naysayers who shy away from challenges or chicken out at the first sight of difficulty. They pursue their goals hard and keep trying till the objective is met.

The PM said the orbiter is still hovering the moon and termed it as a historic achievement in itself.

Addressing a public gathering here, he invoked the famous ‘Mumbai Spirit’ that helps the megapolis face any setbacks, and said the Isro scientists have a similar spirit.

Earlier in the day, Modi had addressed scientists at the Isro control centre in Bengaluru, and told them not to get disheartened by the hurdles in the moon mission and asserted that there will be a “new dawn and a better tomorrow”. — PTI

<https://www.tribuneindia.com/news/won-t-impact-future-missions-isro-official/829431.html>



Sun, 08 Sep 2019

## **40% lunar missions in past 60 ears failed: NASA data**

New Delhi: The success ratio of lunar missions undertaken in the last six decades is 60 per cent, according to US space agency NASA’s ‘Moon Fact Sheet’. Of 109 lunar missions during the period, 61 were successful and 48 had failed, it stated.

In the early hours of Saturday, ISRO’s plan to soft land Chandrayaan-2’s Vikram module on the lunar surface did not go as per script.

This year, Israel, too, launched its lunar mission Beresheet in February 2018 but it crash landed in April.

From 1958 to 2019, India as well as the US, the USSR (now Russia), Japan, the European Union, China and Israel launched different lunar missions — from orbiters, landers and flyby (orbiting the Moon, landing on the Moon and flying by the Moon).

The first mission to the Moon was planned by the US in August 17, 1958, but the launch of Pioneer 0 was unsuccessful. The first successful mission to the Moon was Luna 1 by the USSR on January 4, 1959. It was also the first ‘Moon flyby’ mission. The success had come only in the sixth mission.

In a span of a little more than a year, from August 1958 to November 1959, the US and the USSR launched 14 missions. Of these, only three — Luna 1, Luna 2 and Luna 3 — were successful. All were launched by the USSR.

The Ranger 7 mission launched in July 1964 by the US was the first to take close-up pictures of the Moon.

The first lunar soft landing and first pictures from the lunar surface came from Luna 9, launched by the USSR in January 1966.

Five months later, in May 1966, the US successfully launched a similar mission Surveyor-1. The Apollo 11 mission was the landmark mission through which humans first stepped on to the lunar surface. The three-crewed mission was headed by Neil Armstrong.

From 1958 to 1979, only the US and the USSR launched Moon missions. In these 21 years, the two countries launched 90 missions. — PTI

## Chandrayaan-1 laid the ground

- India first embarked on inter-planetary Rs 386-cr mission on October 22, 2008, with its first moon operation Chandrayaan-1
- The 1,380-kg Chandrayaan-1 spacecraft made more than 3,400 orbits around the moon. It was operational till August 29, 2009
- The Chandrayaan-1 conclusively discovered traces of water on the Moon, a pathbreaking discovery, and water ice in North Polar region

<https://www.tribuneindia.com/news/40-lunar-missions-in-past-60-years-failed-nasa-data/829433.html>



Sun, 08 Sep 2019

## Capturing Space Voyage

<b>June 12:</b> ISRO announces Chandrayaan-2 would be launched on July 15	<b>Aug 14:</b> Chandrayaan-2 successfully enters Lunar Transfer Trajectory
<b>June 29:</b> Rover integrated with Vikram lander, which in turn integrated with Orbiter	<b>Aug 20:</b> Chandrayaan-2 successfully inserted into Lunar orbit
<b>July 4:</b> Integration of Chandrayaan-2 with launch vehicle (GSLV MkIIHM1) completed	<b>Aug 22:</b> ISRO releases pictures of Moon taken from 2,650 km from lunar surface
<b>July 7:</b> GSLV MkIIHM1 moved to launch pad. Countdown for launch commences	<b>Aug 26:</b> More images captured by Terrain Mapping Camera-2 of Chandrayaan 2 released
<b>July 15:</b> About an hour before blast-off, Chandrayaan-2 launch called off due to technical snag	<b>Sept 1:</b> Fifth and final lunar orbit manoeuvre performed
<b>July 18:</b> Chandrayaan-2 launch rescheduled for July 22 from Sriharikota	<b>Sept 2:</b> Vikram lander successfully separates from Orbiter
<b>July 22:</b> GSLV MkIIHM1 successfully launches Chandrayaan-2 spacecraft	<b>Sept 3-4:</b> Two de-orbiting manoeuvres bring Vikram closer to moon
<b>July 24:</b> First earth-bound orbit raising manoeuvre for spacecraft successful	<b>Sept 7:</b> Vikram lander begins descent, loses contact minutes before touchdown
<b>July 26-Aug 2:</b> Three more earth-bound manoeuvre performed	
<b>Aug 4:</b> ISRO releases first set of images of the earth captured by Chandrayaan-2	

## **Air Force shortlists 1st group of astronauts for Gaganyaan**

*25 test pilots part of initial process / Will go to Russia for training*

New Delhi: The Indian Air Force (IAF) has completed the first level of selecting astronauts for the ambitious Gaganyaan mission from its pool of test pilots.

The test pilots underwent necessary extensive physical exercise tests, lab investigations, radiological tests, clinical tests and evaluation on various aspects of their psychology, it said on Friday.

Air Force sources said 25 test pilots were part of the initial selection process.

This will be a multi-layered selection process and only two-three test pilots will make it to the final list, sources added.

“#MissionGaganyaan-IAF completed level-1 of Indian astronaut selection at Institute of Aerospace Medicine. Selected test pilots underwent extensive physical exercise tests, lab investigations, radiological tests, clinical tests and evaluation on various facets of their psychology,” the IAF tweeted.

The first Gaganyaan flight scheduled for 2022 will carry three astronauts, who will be picked from among the test pilots in the armed forces.

“Most maiden missions undertaken by different countries in the past had test pilots. So we are sticking to that for our maiden mission. We are also looking at test pilots from the armed forces which don't have woman as test pilots,” an ISRO official said.

The shortlisting of candidates is being done in batches and the candidates will be sent to Russia for training after November.

India's first man in space Rakesh Sharma, who flew aboard the Soyuz T-11, launched on April 2, 1984, was an Indian Air Force pilot.

The ambitious Gaganyaan mission was announced by Prime Minister Narendra Modi during his Independence Day speech in 2018. — PTI

### **3 for space mission**

- Gaganyaan will take three astronauts to space scheduled for December 2021 or January 2022
- Test pilots underwent extensive physical tests, lab investigations, radiological tests, clinical tests and evaluation on various aspects of psychology
- The Gaganyaan mission was announced by the Prime Minister in 2018

<https://www.tribuneindia.com/news/nation/air-force-shortlists-1st-group-of-astronauts-for-gaganyaan/829353.html>

## **NASA praises India's moon mission, offers joint solar system exploration**

*By Surendra Singh*

New Delhi: US space agency Nasa on Sunday said it was “inspired” with the Chandrayaan-2 mission and that it was ready to tie up with Isro for a joint exploration of the solar system. Nasa’s reaction came a day after Vikram lander’s “hard-landing” even as an Isro source says that a Nasa payload on board Vikram “could cast light on what happened just before contact with the lander was lost” .

Praising India for its difficult landing mission on Moon’s south pole, Nasa tweeted, “Space is hard. We commend ISRO’s attempt to land their Chandrayaan2 mission on the Moon’s South Pole. You have inspired us with your journey and look forward to future opportunities to explore our solar system together. ” The US offer for joint exploration came even as Isro plans to launch its Aditya L-1 solar mission by next year.

A senior Trump administration official, acting assistant secretary for South and Central Asia, Alice G Wells also called India’s mission “incredible” . “The mission is a huge step forward for India and will continue to produce valuable data to fuel scientific advancements, ” he tweeted.

An Isro source told TOI that Nasa’s payload laser reflector array on board Vikram was meant to track the lander’s location and calculate the distance between Earth and Moon. “The US payload, attached to Vikram, could provide vital clues about exactly what happened just before the hard-landing. It could have beamed lasers to several US orbiters in Moon’s circular orbit and given data of Vikram’s final descent. ” He said, “If Vikram had broken, the Nasa payload would have also shattered as it had a glass component. ” However, the Isro source said that “Nasa could have information related to the final descent that it could share with India” .

Just before the lander's hard-landing, former Nasa astronaut Jerry Linenger had explained to TOI about the role of the US payload, saying “laser reflector on board the lander would beam a laser to orbiters around Moon (orbit), which would be reflected and the return signal would be assessed to find the exact altitude. By doing so, it would help make Moon mapping much more accurate.

<https://timesofindia.indiatimes.com/india/nasa-praises-indias-moon-mission-offers-joint-solar-system-exploration/articleshow/71038950.cms>