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New, lethal Pinaka scores bulls-eye in testing

By Ajai Shukla

At the peak of the 1999 Kargil conflict, when the army was using all the firepower it could muster to pulverise Pakistani positions as Indian soldiers clawed their way up the steep, exposed mountainsides towards them, a new, secret weapon entered action for the very first time.

The Pinaka multi-barrelled rocket launcher (MBRL) became the first Indian prototype weapon, then still being developed by the Defence R&D Organisation (DRDO), to be used in actual combat. While the television crews covered the GRAD BM-21 rocket launcher hurling its fiery bolts towards Tiger Hill, the Pinaka — more accurate, lethal and with a far longer range — was proving its mettle away from the cameras.

This has never been revealed until now. Nor, the fact that Pakistani mortar fire wounded a young DRDO scientist who was operating the Pinaka. Like a soldier, he continued firing until that operation was over.

On Tuesday, at Chandipur, on the Odisha coast, the DRDO successfully test-fired a lethal guided Pinaka rocket that will multiply the system's capability manifold. While the Pinaka Mark I rockets that currently equip two regiments of the Indian artillery (with two more regiments under production) can destroy targets up to 37.5 kilometres (km) away, the guided Pinaka rocket will accurately strike targets at over twice that distance. Furthermore, while the existing, unguided, free flight Pinaka rockets can be used only against area targets (typically, an infantry position spread out across 500 metres), the guided Pinaka strikes targets with pinpoint accuracy. In the two tests conducted so far — the first on January 12 and a second today — the guided Pinaka has struck targets over 60 km away with an accuracy of 25 metres.

“The mission met all the objectives. The radars, electro optical and telemetry systems at ITR Chandipur tracked and monitored the vehicle all through the flight path”, said a DRDO release today.

That provides the Indian military with an ideal weapon for striking terrorist camps across the Line of Control (LoC) with pinpoint accuracy, eliminating the need to risk soldiers crossing the border on “surgical strikes”.

The Pinaka would be equally effective in supporting attacks under the army's “Cold Start” plan, which involves capturing enemy positions in lightning strikes before they can be reinforced. The volume and precision of firepower that a Pinaka regiment brings down would stun defenders and leave attacking forces with an easy task.

The Pinaka rocket delivers 100 kilograms of high explosive onto the target. Each Pinaka launcher has 12 rockets in its tubes, which can all be fired within 44 seconds. That means a Pinaka battery, which has six launchers, can pummel a target with 7.2 tonnes of high explosive in just 44 seconds.

The Pinaka rocket's “pre-formed fragmented” (PF) warhead is a masterpiece in lethality. The blast of high explosive when it strikes the target breaks the warhead's casing into 21,000 high-density, tungsten alloy spears that hurtle across the target area, tearing through anything in their paths. For a briefing on the technology in the new, guided Pinaka, Business Standard visited the Armament R&D Establishment (ARDE) in Pune, the DRDO laboratory that has masterminded its development.

While the Pinaka Mark I, and the longer-range Mark II that followed it, are free-flight rockets that follow a ballistic path, much like a stone lobbed towards a target. In contrast, each guided Pinaka rocket has an on-board computer calculating its flight trajectory and location, using the US Global Positioning System (GPS), the Russian GLONASS or the Indian GAGAN — whichever is most convenient. When the rocket deviates from its desired trajectory, aerodynamic canards on the rocket body are manipulated to bring it back on track.

The Pinaka programme is an exercise in collaboration, says Dr KM Rajan, who heads ARDE. Setting a precedent, the DRDO cooperated with two private sector firms, Larsen & Toubro; and Tata Power (Strategic

Engineering Division) to build the launcher and the command posts that control its operations. Ordnance Factory Chanda, near Nagpur, builds the Pinaka rockets and warheads. Bharat Earth Movers Limited (BEML) builds the Tatra high mobility vehicles on which the system is mounted, as well as its mobile logistics systems.

The Pinaka constitutes an unalloyed DRDO triumph, with the Mark I costing just Rs 55 crore to develop. That economical effort will result in the induction of 22 Pinaka Mark I regiments into the army, at a cost of Rs 61,000 crore. Of these, two are already in service, two more contracted, and another 10 cleared by the Cabinet Committee on Security.



Wed, 25 Jan, 2017

(Online)

DRDO's 70-km-long Pinaka multi-rocket launcher is the latest boost to Indian Army's armoury

By Ashna Kumar

Pinaka multi-barrel rocket launcher can be used to carry out surgical strikes even without crossing the border.

The Indian Army has a new weapon to flaunt, with Defence Research and Development Organisation (DRDO) having developed a multiple rocket launcher - Pinaka for it with a range of 70kms.

Pinaka rockets will be bought for an estimated cost of Rs 40 crore for 22 regiments of multi-barrel rockets launchers.

Here's what you need to know:

1. Pinaka multi-barrel rocket launcher system is an indigenous weapon system designed and developed by DRDO and produced in collaboration with L&T and Tata Power SED in India only.
2. The system was used effectively in Kargil war.
3. DRDO on Tuesday tested a new version of the rockets which can be guided to land bang on enemy targets.
4. It can be used to carry out surgical strikes even without crossing the border.
5. It will also help in reducing the weapon system requirements for the Army.
6. It can also help reduce requirements for imported Russian Smerch long range rocket systems.
7. Army has already inducted 10 regiments of the Pinaka missiles in its artillery wing.
8. Missile deployed on both Pakistan and China borders.

THE ASIAN AGE

Fri, 27 Jan, 2017

India sparkles under overcast sky

Tejas, Akash Weapons System, marching squads, tableaux leave spectators spellbound.

New Delhi: The overcast sky stood out in strong contrast to the magnificent men in uniform marching in precise unison at Rajpath, India's ceremonial boulevard, during the 68th Republic Day celebrations parade on Thursday.

With the Crown Prince of Abu Dhabi Sheikh Mohammed bin Zayed Al Nahyan attending the event as the guest of honour, a 149-member marching contingent from UAE comprising soldiers from different forces, led

by a band comprising 35 musicians from the Gulf country, led the parade. He was seated next to Prime Minister Narendra Modi who wore a pink coloured 'safa' (turban).

After the unfurling of the National Tricolour, the National Anthem was played followed by a 21-gun salute.

President Pranab Mukherjee took the salute of the marching contingents. Alongside the Crown Prince, the ceremonial parade was watched by vice-president Hamid Ansari, former PM Manmohan Singh, Congress chief Sonia Gandhi and the country's top political and military brass, besides the diplomatic community.

The parade was commanded by Lt. Gen. Manoj Mukund Naravane, General Officer Commanding, Delhi Area while the Army marching contingents included horse-mounted columns of the 61st Cavalry, the Mechanised Infantry Regiment, and soldiers from the Bihar Regiment, Gorkha Regiment, Madras Engineering Group among others.

The Navy contingent comprised 144 young sailors led by Lieutenant Aparna Nair.

A number of weapons systems and aircraft including the homemade Tejas light combat jets and the Airborne Early Warning and Control System (AEW&C) developed by DRDO were on display, showcasing India's military prowess.

The Indian Army's missile firing T-90 'Bhishma' tank, Infantry Combat Vehicle BMP-2K, Mobile Autonomous Launcher of the BrahMos Missile System, Weapon Locating Radar 'Swathi' and Akash Weapons System, and Dhanush artillery guns were among the main draw in the mechanised columns.

Tableaux from 17 states and Union Territories and six central ministries and departments showcased the varied historical, artistic and cultural heritage

Twenty one of the 25 children who won the National Bravery Award also participated in the parade. Four children have received the award posthumously.

The grand finale of the parade was a spectacular fly-past by the Indian Air Force which displayed various formations like 'Chakra' and 'Vic' leaving spectators spell-bound. The 'Hercules' formation comprising three C-130J Super Hercules aircraft also drew loud cheers. The Indian Navy's tableau showcased the lethal Marine Commandos.

The paramilitary and other auxiliary civil forces included the Border Security Force's Camel Contingent, Indian Coast Guard, Central Reserve Police Force, Central Industrial Security Force, Delhi Police, National Cadet Corps and National Service Scheme.



Fri, 27 Jan, 2017

Fighting Spirit: Getting To Know Hal Tejas

By Maleeva Rebello

This Republic Day, the indigenous fighter plane Tejas will make its debut. The last native plane flown was HAL Marut in the 1980s. Here's a look at some of the features of HAL Tejas

1. HAL Tejas is an Indian single-seat, single-jet, multirole light fighter designed by the Aeronautical Development Agency (ADA) and Hindustan Aeronautics Limited (HAL) for the Indian Air Force and Navy.
2. It came from the Light Combat Aircraft (LCA) programme, which began in the 1980s to replace India's ageing MiG-21 fighters. LCA was officially named Tejas in 2003 by the then Prime Minister Atal Bihari Vajpayee.
3. The aircraft has a tail-less compound delta-wing configuration, which gives it high maneuverability.
4. The Tejas is the second supersonic fighter developed by HAL after the HAL HF-24 Marut.

5. The aircraft is equipped to handle air to-air missiles, air-to-surface missiles, anti-ship missiles, bombs and rockets.
6. It is considered to be the lightest multi-role supersonic aircraft of its class.
7. The aircraft can travel at a maximum speed of 2,205 km/hr for FOC version and 2,000 km/hr for IOC version.
8. In terms of the weapons that it can carry, Tejas is designed to host a veritable plethora of air to air, air to surface, precision guided and stand-off weaponry. In the air to air arena, the Tejas carries beyond visual range weapons.

दैनिक जागरण

Fri, 27 Jan, 2017

तेजस-सुखोई ने अपनी गर्जनाओं से जीता दिल

मार्च पास्ट के साथ सेना के बैंड की मधुर धुन ने बांधा समां

संजय मिश्र • नई दिल्ली

68वें गणतंत्र दिवस समारोह में राजपथ पर तीनों सेनाओं के अफसरों और जवानों के मार्च पास्ट के साथ इनके बैंड की मधुर धुन ने समां बांध दिया। मोर्चे पर जांबाजी दिखाने वाले परमवीर चक्र, शौर्य चक्र और अशोक चक्र विजेताओं के साथ राष्ट्रीय वीरता पुरस्कार प्राप्त बच्चे प्रेरणा की मिसाल दे रहे थे। श्वेत अश्व के नाम से मशहूर मिलिट्री पुलिस के जवानों के मोटरसाइकिल पर ही क्रिसमस टी, कमल और एयक्राफ्ट से लेकर सुदर्शन चक्र के अद्भुत करतब दिखाए।

तेजस, सुखोई, जगुआर ने

दिल जीता : राजपथ पर मौजूद हजारों की भीड़ उस समय रोमांच के शिखर पर पहुंच गई जब वायुसेना के युद्धक विमानों ने अपने करतब का अद्भुत नजारा पेश किया। इसकी शुरुआत आकाश में चक्र बनाते हुए एमआइ हेलीकॉप्टर से हुई। सीजे-130 सुपर हर्क्यूलिस विमान ने आकाश में विजयी चिह्न के अंदाज में उड़ान भरी। अर्ली वार्निंग सिस्टम रडार यंत्र से लैस विमान ने करतब दिखाए। मगर स्वदेश निर्मित पहले सुपर सोनिक लाइट वेट लड़ाकू विमान 'तेजस' और 'सुखोई' के साथ 'जगुआर' विमानों ने अपनी गर्जनाओं और रफ्तार से सबका दिल जीत लिया।

चंद्र सेकंड में छुआ आकाश



'तेजस' भारत में बना पहला लड़ाकू विमान है, जो वायुसेना में शामिल होगा। सबसे विध्वंसक 'सुखोई' ने जब 950 किमी की रफ्तार से उड़ान भरते हुए चंद्र सेकंड में आकाश छुआ, तो सभी का सिरगर्व से ऊंचा हो गया।



Fri, 27 Jan, 2017

HAL rolls out indigenously upgraded hawk Mk132

Ahead of biannual Aero India 2017 which will be held in aerospace capital Bengaluru from February 14, Hindustan Aeronautics Limited (HAL) has rolled out first indigenously upgraded Hawk Mk132 on Thursday. This would add to the training capabilities of Indian forces.

HAL Chairman and Managing Director T Suvarna Raju said in a statement that this project was conceived under make in India and this was the 100th Hawk produced by HAL. He said "This is the 100th Hawk aircraft produced at HAL and we are proud that it has 'Make in India' mark".

HAL had conceived a programme for indigenous up gradation of the Hawk Mk132 for achieving self-reliance and has successfully accomplished it, the statement said.

“This aircraft, which was rolled out on the eve of Republic day, would be on the flying display in the forthcoming Aero-India 2017 at Bengaluru,” Raju added.

He said the upgrade was taken up so as to be independent in matters like integration of new sub-systems or modifications, obsolescence management of avionics systems and to enhance the aircraft operational and training capabilities. “HAL rolled out its own aircraft with the upgrades in a record time”, he added.

According to HAL in the Hawk upgradation programme, imported Mission Computer and Data Transfer Units have been substituted with HAL designed and developed systems. “This indigenous Mission Computer in the dual redundant configuration has additional capabilities such as Digital Map Generation which provide improved situational awareness”, he said.

The Embedded Virtual Training System offers improved training capability over the existing system. HAWK-i also provides secured voice communication and data link capability by integration of Softnet Radio and pilots can configure and select cockpit Human Machine Interface for different aircraft platforms.

Meanwhile HAL is showcasing HTT-40 (Hindustan Turbo Trainer-40) a new basic training aircraft being developed for the Indian Air Force (IAF) at the Aero India 2017. The new aircraft will replace the ageing fleet of HAL HPT-32 Deepak trainers that are in service with the IAF.

The HTT 40 will be primarily used for basic flight training, aerobatics, instrument flying and close-formation flights, whereas its secondary roles will include navigation and night-flying.

The first prototype of HTT-40 Trainer was rolled out from the Aircraft Research and Design Centre (ARDC) hangar, in February 2016. The HTT-40 project was conceptualised by HAL to fulfil the IAF's requirement of 181 trainer aircraft. Due to the HTT-40's development delays, the air force placed an order in May 2012 for 75 Pilatus PC-7 Mk II turboprop trainers to meet its urgent operational requirements.

The HTT-40 is a fixed-wing aircraft incorporating an all-metal airframe design. It features a bubble canopy, T-tail configuration and a retractable tricycle landing gear system with a steerable nose wheel.



Fri, 27 Jan, 2017

DTTI: First signs good but India to wait and watch on defence ties with US

Conceived under Obama administration, India-US bilateral defence projects have shown little progress.

By Sushant Singh

IN HIS testimony to the US Senate during his confirmation earlier this month, new American Defence Secretary General James Mattis highlighted the centrality of the India-US Defence Technology and Trade Initiative (DTTI) to ties between the two countries. Because of the DTTI, General Mattis said, the bilateral defence relationship “has grown to the benefit of both countries”. But, notwithstanding General Mattis’s optimism about the initiative, it has shown some progress on only two projects so far.

The DTTI mechanism was launched in 2012. It was a brainchild of then US deputy secretary of defense, Ash Carter. It progressed when Carter took over as the US defence secretary, and the first four projects under the DTTI were announced during President Barack Obama’s visit to New Delhi as chief guest for the 2015 Republic Day celebrations. India and the US are currently working on six projects under the DTTI framework and two more American proposals are under the consideration of the Defence Ministry.

“The whole idea of the DTTI was to cut through the government bureaucracies on the two sides. As a mechanism for defence cooperation, it has to focus on advanced technologies. Fifty per cent of the original projects have reached project agreement stage, two are in a limbo, and we are hopeful of progress on the rest,” an official dealing with the DTTI framework told The Indian Express.

The two projects in a limbo, the Roll-on Roll-off Kit and the Micro Unmanned Aerial Vehicle, have not progressed at all. Sources said these two projects are industry-focused and defence companies have not shown adequate interest in them. They will thus “need to be explored further”.

The Next General Individual Protection Ensemble and Mobile Electric Hybrid Power Source projects reached the agreement stage in 2015.

DRDO and US Labs are the lead agencies from the two countries for these projects. Scientists from the two agencies discuss the progress on a monthly basis via telephonic conferences besides meeting twice a year, sources said.

THE DTTI PROJECTS

PROJECT AGREEMENT STAGE

- Next General Individual Protection Ensemble
- Mobile Electric Hybrid Power Source

NO PROGRESS

- Roll-on Roll-off kit
- Micro Unmanned Aerial Vehicle

AT DISCUSSION STAGE

- Digital Helmet Mounted Display
- Joint Biological Tactical Detection System

UNDER CONSIDERATION

- Advanced Tactical Ground Combat Vehicle
- Future Vertical Lift Helicopter

The Digital Helmet Mounted Display and Joint Biological Tactical Detection System projects were proposed last year and are currently “at a discussion stage”. Besides these six joint projects, India and the US formed five joint working groups in addition to the original two working groups under the DTTI.

Among the two American proposals under the consideration of the Defence Ministry is an offer to include Israel for joint development and production of Advanced Tactical Ground Combat Vehicle (ATGCV). The US offer for trilateral cooperation on the futuristic military platform was made last November but official sources said that they are yet to make up their mind on it. The Defence Ministry is likely to convey its decision to the Americans at the next DTTI meeting in March or April, which is scheduled to be hosted at the Pentagon.

“The ATGCV project potentially goes way beyond the Futuristic Infantry Combat Vehicle (FICV) which we are developing indigenously here in India. The Americans feel that three advanced countries can bring their advantage of expertise and economy to the project which, if successful, could then be used by the armies of all the three countries,” officials told The Indian Express.

The American side also proposed bilateral development of Future Vertical Lift Helicopter (FVLH) in November under the DTTI. An announcement on the project is expected at the next DTTI meeting.

Besides these new projects, the Pentagon had proposed to the Defence Ministry that the two sides work on a deal for an American combat fighter aircraft, whether F-16 or F-18, under the DTTI. This proposal was made at the DTTI Inter-Agency Task Force meeting early last year. But the Defence Ministry did not want the fighter aircrafts to be considered under the DTTI. Defence Minister Manohar Parrikar recently said that the government would chose a single-engine foreign fighter, the American F-16 or the Swedish Gripen, under Make in India to supplement the 36 Rafale fighters in the medium-weight category. The decision, Parrikar said, will only be made after a Strategic Partnership model, to identify an exclusive private defence company for manufacturing the aircraft in India, has been made by his ministry.

Donald Trump’s victory in the US Presidential polls had left the Indian side concerned about the state of the DTTI because it was seen as Carter’s personal project. These concerns were addressed with the passage of the National Defence Authorization Act of 2017 (NDAA 2017) by the US government last month, in which Section 1292 on ‘Enhancing Defence and Security Cooperation with India’ institutionalised the DTTI mechanism.

Despite General Mattis’s statement now that “the US-India (defence) relationship has been strengthened in recent years”, New Delhi remains unsure about the priority the Trump administration may give to defence cooperation. By all accounts, New Delhi will adopt “a wait and watch attitude”.

India Already Has a Strong Net to Catch the New Pak Bird 'Ababeel'

By Pranay Upadhyay

Pakistan on Tuesday announced first successful test firing of its new surface-to-surface, nuclear-capable missile Ababeel, with a range of 2,200km. Pakistan military claimed that its new missile can deliver multiple warheads, using Multiple Independent Re-entry Vehicle (MIRV) technology.

Ababeel Weapon System is aimed at ensuring survivability of Pakistan's ballistic missiles in the growing regional Ballistic Missile Defence (BMD) environment. Ababeel test came, just two weeks after Pakistan claimed of conducting the successful test of Submarine Launch Cruise Missile. So what do these rapid missile tests mean for India? Is India prepared to take on these threats? How true are claims made by Pakistan? At least Indian scientific community gives an assuring answer and missile experts take Pakistan's claims with a pinch of salt. Dr Avinash Chander, former Chief of DRDO and longtime head of India's Ballistic Missile Systems including Agni, in conversation with News18, said that "India has a credible deterrence and our missile programme is capable of taking on any challenge." However, he acknowledged that the test of the new surface-to-surface missile by Pakistan has changed the strategic threat dynamics in India's neighbourhood and this needs to be factored in, in India's future military planning and preparedness. Meanwhile, tall claims made by Pakistan have again raised doubt within Indian science community. Dr Chander wonders if Pakistan's claim regarding MIRV technology in a short-range missile with a range of just 2,200km is true. According to veteran missile scientist, use of such technologies in a short range missile is difficult. Primarily, it is used in long range missile. So we need to wait for more substantial inputs to verify Pakistan's claims.

Globally, only US, Russia and China have proven MIRV-enabled missiles in their arsenal. India is still working on it and it is expected that future generations of Agni missiles would be equipped with such capabilities. Interestingly, all the MIRV-enabled missiles are Long Range Inter-Continental Ballistic Missiles with a minimum strike range of over 6,000km. Therefore, it is difficult to believe that Pakistan has developed an MIRV-enabled missile with a range of just over 2000km. Nonetheless, to meet any challenge from Ababeel, India's missile defence battery is all charged up. Indian scientists have been working on a two-layered missile defence system since few years. One is designed to kill an enemy missile before it even enters the atmosphere while the other is developed to shoot any hostile missile in the atmosphere. While Exo-Atmospheric missile defence system PDA can destroy any hostile missile at the height of over 80km, the Endo-Atmospheric missile defence mechanism, AAD, can kill enemy missile at the height of up to 30km from the ground level. In the last one decade, AAD system has been tested over 7 times successfully.

"India is among the top few nations in the world who has a complete indigenous and highly-successful "Multi-level Strategic Deterrence" programme as well as a "Two-layer Ballistic Missile Defence" programme, says former DRDO Scientist Dr Ravi Gupta. "Though Ballistic Missile tests being conducted in our neighbourhood by a country with a hostile track record and its support to terrorist activities is indeed a threat to the world peace, India with its indigenous capabilities is fully prepared to take care of any threat," he adds.

According to DRDO, India has already tested the missile defence system, including the capability to take down multiple warheads. The test of this capability was first tested five years ago. DRDO statement issued in November 2012 said, "A special feature of intercepting multiple targets with multiple interceptors was demonstrated successfully. An electronic target with a range of 1500km was launched and the radars picked up the target missile, tracked the target missile subsequently & launched an electronic interceptor missile.

This electronic interceptor missile destroyed the electronic target missile at an altitude of 120km. All the four missiles were tracked by the radars and all the guidance and launch computers operated in full operational mode for handling multiple targets with multiple interceptor.

All the four missiles were in the sky simultaneously and both the interceptions took place near simultaneously. This has proved the capability of DRDO to handle multiple targets with multiple interceptors simultaneously. The complete Radar Systems, Communication Networks, Launch Computers, Target update Systems and state of the art Avionics have been completely proven in this Mission.”



Fri, 27 Jan, 2017

China open to work with Russia, U.S. to tackle global challenges

China on Thursday signalled its openness for a trilateral partnership with Russia and the U.S., following Moscow’s advocacy that the three countries should develop relations jointly. Asked about the comments Russian Foreign Minister Sergey Lavrov made on Wednesday in Parliament on forming a trilateral partnership between the three countries, Chinese Foreign Ministry spokesperson Hua Chunying said China had taken note of the “positive comments”. “China, Russia and the U.S. are all major countries with worldwide influence and permanent members of the UN Security Council. For world peace, stability and development, we share a great responsibility. We aim to build a generally stable and positive major country relationship; with Russia, we [wish to] deepen our comprehensive strategic partnership of cooperation and we also work to promote the major country relations with the U.S.,” Ms. Hua said. “So we are willing to work together with Russia and U.S. to address the problems and challenges facing the world today.”

During his address at Russian Parliament, Mr. Lavrov said: “We would like to see Russia, the U.S. and China to develop relations together.” He also underscored that the development of Russia’s relations with any country of the world “will not challenge Russian-Chinese strategic partnership”, Russia Tass news agency reported. Mr. Lavrov’s statements acquires importance in the wake of a debate in China on whether Beijing would be marginalised in anticipation of closer ties between Moscow and Washington under the presidency of Donald Trump. Asked whether the trilateral partnership among Beijing, Moscow and Washington could acquire a “strategic” dimension in the future, Ms. Hua said she had given a “very general view”, and this was in response to the observations of the Russian Foreign Minister.

But she pointed out that the positive interaction between the three countries would be beneficial for all the three sides and the peace and development in the region and the world. “So we think that the three countries should have positive interaction. Like Foreign Minister Lavrov said, the development of this trilateral relationship would not be targeted at any other party. It will be within our framework of our major country relationship featuring a win-win cooperation.”

In her response, Ms. Hua highlighted the unprecedented level of friendly ties between China and Russia. “Indeed the Russia-China comprehensive strategic partnership of coordination is at its best in history.”



Fri, 27 Jan, 2017

ISRO’s new push for global share

70 engineers of local industry being trained to assemble, test satellites.

Bengaluru: About 70 engineers of a local industry are getting the hang of assembling and testing satellites inside Indian Space Research Organisation Satellite Centre, Bengaluru, as the space agency has decided to provide India Inc the launch pad to reach for a slice of the multi-billion-dollar global satellite market. To start with, these engineers will learn the ropes through a contract worth a couple of crores of rupees for rolling out

two satellites, both stand-by for configuration of seven satellites which constitute the Indian Regional Navigation Satellite System (IRNSS) constellation scheduled to be dedicated to the nation shortly by Prime Minister Narendra Modi. If these engineers are successful in manufacturing and testing both satellites within the next 18 months, Isro is likely to place an order for a couple of communication satellites with the same team.

The next step will be to bid for manufacture of satellites for the global market. "It's just the beginning. The effort is to make Indian industries proficient in space technology so that they can meet the demands of Indian and global markets. It will be a significant achievement if the industries capture even a fraction of the global satellite market," A.S. Kiran Kumar, chairman, Isro, told this newspaper.

Sources in Isro said the IRNSS constellation will have a footprint of 1,500 km around the country, covering all sea routes, as well as support studies in remote sensing, plate tectonic movement, and those related to the ionosphere. In case one of these seven satellites is hit by a snag, the space agency ought to launch a replacement and cannot manage by leasing a transponder from other satellites.

Therefore, the space agency planned two spare satellites, and picked Alpha Design Technologies, the lowest bidder, for on-the-job training as well as assembly, integration and testing of satellites. "A follow up order is likely for some communication satellites if the two IRNSS satellites are integrated and tested within a year-and-a-half" sources said adding that eventually ISRO will pass on the responsibility of rolling out commercial satellites to the companies so that its engineers and scientists could focus on R&D projects and new technologies.

On its part, Alpha Design Technologies has decided to build a state-of-the-art satellite manufacturing, assembly, integration, testing and qualification facilities over the next two years in order to be prepared for follow-up orders from Isro. "It is a significant step for us. As part of the contract, initially our teams will get ISRO supervision and later independently make complete satellites," says Col. H.S. Shankar, chairman and managing director, Alpha Design Technologies.



Fri, 27 Jan, 2017

Innovate In India

By Rajiv Kumar

A strong intellectual property framework is critical to making India the world's pharmacy

A robust intellectual property (IP) rights framework encourages investment in innovation and promotes the development of new product and processes. India is now at the cusp of its transformation to becoming a knowledge, science and technology driven economy, as it tries to expand its share in global markets and raise per capita incomes. To do so, it will have to move up on the technology ladder and compete not only on the basis of lower cost but also by coming up with new products.

This is true of all sectors including of course the pharmaceutical sector in which it is a mistake to view patents as an obstacle to life-saving drugs. Indeed, there can be no access to drugs that no one has developed! Generic medicines exist because someone has invested in research and innovation to invent new medicines. Patented medicines feed the pipeline for generic medicines. IP rights, including patents, are fundamental to the discovery of new molecules that push forward the curative frontiers. India's objective of 'health for all' cannot be achieved, unless we incentivise investment in medical innovation. However, the discovery and development of new drugs is a long, arduous and resource-intensive process. Unlike patents in other industries, pharmaceutical patents cover products that take a long time to develop; it takes 10-15 years to develop a new medicine from the first stage of discovery of the new molecule or formulation to commercialisation.

Thus, significant portions of the patent term for a new drug are lost before it even enters the market. According to the Tufts Center for the Study of Drug Development, the average cost to develop a new medicine, including the cost of failure, is \$2.6 billion.

After all this, nothing is certain and the odds are overwhelmingly against actually bringing a new medicine to patients. Most compounds never reach the clinical trial phase and, of those that do, less than 12% are approved by the Federal Drug Administration. Of the medicines that actually reach the market, only one in five ever recoup the average cost of development. Despite the high risk, biopharmaceutical companies have continued to make progress in the discovery and development of new diagnostic tools and medicines. According to industry estimates, more than 7,000 innovative drugs are on the anvil worldwide, with over \$500 billion invested in R&D since 2000. Life-saving drugs are necessary for combating life-threatening diseases, but patients also need new treatments for ever-changing disease profiles. There are still numerous unmet medical needs and many therapeutic areas that still need to be addressed with innovation driven cures.

We need to continue research in cancer, diabetes and mental illnesses. Parkinson's, Alzheimer's and dengue still have no cure. We need our domestic and global companies to invest time, energy and resources in ongoing research that focuses on India-specific diseases, which may not be attended to by foreign pharmaceutical companies. We urgently need medical solutions to address the burden of debilitating tropical diseases such as tuberculosis, malaria, dengue, chikungunya, leishmaniasis, filariasis and measles. Only 21 of the 1,556 new medicines approved between 1975 and 2004 were developed to treat tropical diseases and tuberculosis. The incidence of multi-drug resistant TB is skyrocketing, and new medicines are crucial to curb the rise of this killer disease. Pro-innovation policies and increased access to medicines for the poor can exist side by side. The key is to balance innovation with access and affordability, within a robust IP environment.

Patents are not the barrier to access in developing economies. The real hurdle is inadequate health infrastructure and poor delivery systems. Over 90% of the drugs on the World Health Organization's List of Essential Drugs are not patent protected, and sold at comparatively low prices. Yet, these still don't reach those most vulnerable and in need. In India also, WHO data shows that while 95% of medicines are unpatented, only two-thirds of them reach patients.

Protecting IP rights will help create new solutions for rare diseases and new medicines to save and improve lives. In addition to 'Make in India' we need to 'Innovate in India', if India is to truly become a 'pharmacy to the world'. India needs to build its capability for innovation, realise its research potential and take its rightful place in the global arena. An innovative pharmaceutical industry requires a strong, stable and predictable IP environment. A robust IP framework has the potential to support a number of economic and socio-cultural benefits, provide an opportunity to stimulate India's biopharmaceutical industry and create thousands of high value jobs; while paving the way for greater foreign direct investment.

Above all, innovation is needed to address the challenges of a growing disease burden and innovators need the assurance that research will be rewarded. We need a different dialogue on the subject of making life-saving drugs affordable in India.

There is no question that everybody should have access to all medicines. Where patented products are largely beyond the reach of Indian patients, companies must create robust programmes to make them available for free or for a fraction of their price. Global companies could consider differentiated pricing schemes for developing countries.

Policy should encourage innovation in India if only to make our firms globally competitive and at the same time provide reasonably priced medicines to the population. The two objectives are not inherently contradictory. *The writer is Senior Fellow, Centre for Policy Research*