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Cost of cochlear implant operation may go down to Rs 1 lakh

New Delhi: A silent revolution is on to help speech-impaired children.

The government is planning to put the high-cost Cochlear implant surgery within the reach of most citizens, with talk of experimental trials of an indigenous version estimated to cost as less as Rs one lakh.

The price of a Cochlear implant till recently was Rs 11 lakh per unit but crashed to Rs 6 lakh after the Centre invited competitive bids for its scheme supporting disabled persons with aids and appliances. The Centre has begun to support 500 children annually for Cochlear implants.

Defence R&D organisation, DRDO, recently made a presentation to Artificial Limbs Manufacturing Corporation of India under social justice ministry (MSJ) on the implant it has developed. While it is a much more affordable version of available cures for hearing-speech handicaps, it has been languishing without clinical trials for some time now. "We are committed to making Cochlear implants cheap and are looking at clinical trials for what the DRDO has developed," joint secretary in-charge of disability in MSJ, Awanish Awasthi told TOI.

The main roadblock in clinical trials is the risk of failure at experiment stage. Sources said the Centre may look at giving risk guarantees to the person who agrees to undergo the trial surgery.

"A surgery that is so expensive for a disability so common, bold steps are needed," a senior official said.

Cochlear implant can be a magic cure for children who are deaf and, as a consequence, speechless. This operation can only be done on children of up to six years.

The cost crashed from Rs 11 lakh, well out of the reach of common man, to Rs 4.70 lakh after the Centre gave bulk orders for its scheme. With the surgery costing another Rs 60,000, the Centre has decided to give Rs 6 lakh per implant. It is virtually the market rate now.

It is hoped that the next bidding, with greater quantum of orders, would bring the cost down further.

An estimate shows that around 10,000 children need implants annually and only Tamil Nadu, Kerala, MP, Chhattisgarh and Maharashtra provide it in small numbers. "Should we support all the kids? The cost would be a question," an official said, quoting the discussion in the government. It has put the DRDO implant at the top of the government priority.

There is a rapid spread in the number of doctors doing the implants after the Centre empanelled 140 hospitals.

For policy planners, the objective is to make the implant cost low enough to enable people to do it on their own at market rates.

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At Pokhran, Indian designed planes & missiles show firepower, DRDO exults

Pokhran: In the deserts of Pokhran, not far from the border with Pakistan the Indian Air Force (IAF) displayed its might, in less than four hours 181 aeroplanes bombed several targets. For the very first

time in India's history indigenously made potent missiles like Akash and Astra were openly fired in front of a discerning audience.

This exercise called 'Iron Fist 2016' also showcased the firing potential of country's highly versatile Tejas fighter aircraft or the Light Combat Aircraft (LCA). Sources in the Defence Research and Development Organisation (DRDO) confirmed that this was the first time the Prime Minister and President of India were witnessing in front of their eyes the immense capability of these Indian made weapons platforms.

The DRDO once dubbed as the 'Defenceless Research and Development Organisation' quietly celebrated the debut firing of its lead platforms in an open 'operational fire power demonstration' that was also beamed live all over the world and in front of defence attaches of the most powerful countries of the world. India's multi-role fighter jet Tejas showed its prowess by performing twin roles in the same sortie.

The 9800 kilogram supersonic plane first came and from high above the witnessing stand fired a laser guided bomb onto a target on the ground. Then it converted itself from a ground attack platform into an air-to-air combat mean machine. In the same flight the LCA fired a missile onto an aerial target. Technically, it fired a R-73E missile onto a simulated enemy plane.

The graceful LCA mostly designed in Bengaluru executed its roles with elegance, but subsequently there were reports that the bomb dropped by Tejas missed its target possibly because the fuse of the bomb miss-performed and to the naked eye it also seemed that the air-to-air missile fired by the LCA did not directly hit the 'flare' which was being used as simulated enemy war plane.

Though later, it was clarified that the R-73E missile did hit the target but since the flare is 'minuscule' compared to full-fledged enemy air plane it may have seemed to have gone awry. Any which ways the Indian plane that costs about Rs 200 crore a piece or about USD 28 million is a unique fighting machine. In comparison, the Rafale Jet costs upwards of Rs 1600 crore a piece.

Much has been written that the first sanction for the design of the LCA started in 1983 and by now as per a report by the Comptroller and Auditor General of India the Ministry of Defence has invested Rs 10,397 crores on this project. Despite this long gestation, the plane is considered the best in its class with the IAF hopefully going to induct these planes into the battle ready cadre this year. The IAF is already short of nine squadrons of fighter planes.

To some of the naysayers of Tejas a fact should be driven that it does take anywhere between 15-20 years to design a new fighter plane even by advanced countries that have serially produced fighter jets, for India this was really only a second venture albeit with a huge gap.

Recently the Tejas also had its first foreign debut when earlier this year when two planes flew to perform aerobatics at the Bahrain International Air Show essentially India expressing its desire that this 'made in India' plane could be exported if required by other countries.

Now well-meaning and knowledgeable defence experts are even questioning whether India really needs to go ahead and buy either 36 or the 126 'Medium Multi-Role Combat Aircraft' like the Rafale at all. The first 'request for proposal' was put out almost 15 years ago and till date the Indian Air Force and the Indian government have not really made up their minds on how to cross the last mile for this purchase.

Now that the LCA is almost near, the finish line it possibly makes sense to opt for an Indian made plane rather than depend on an expensive foreign vendor, even though the LCA comes with a third of the payload carrying capacity and a third of the range.

Many in the IAF who decry the delays in the making of the Tejas should also answer with parity the delays in simply buying off the shelf foreign fighter planes. If the need was so pressing to bridge, the gap for replacing the aging Mig-21's then why is the IAF and the government not able to make a decision for the last 15 years. May be now that both President Pranab Mukherjee and Prime Narendra Modi have personally seen the Tejas platform fire ammunition last week an afterthought may occur and the local effort could just zoom past.

The DRDO also highlighted its ASTRA missile a beyond visual range air-to-air missile capable of engaging targets from anywhere between 20-80 kilometres. This missile was fired from a Sukhoi-30 MKI aircraft and sources said it hit the target, but since it goes and strikes a target beyond the visual range there was no possibility of witnessing the hit.

This was the first time the DRDO publicly showed its advanced air-to-air missile, which is capable of undertaking as, claimed some manoeuvres at 40 G levels making it very versatile. This 3.8-meter length missile has been under development for ten years.

At Pokhran in a night, firing the IAF for the first time highlighted its recent indigenous acquisition the Akash Missile System. A single missile was fired from very close to place where the VIP stand and it left behind a smoke trail before disappearing after the imaginary enemy target in the night sky. According to DRDO which developed the Akash missile system it is a 'medium range surface to air missile with multi-target engagement capability.

It uses high-energy solid propellant for the booster and ram-rocket propulsion for the main phase. The propulsion system provides higher level of energy with minimum mass, compared to conventional solid/liquid rocket motor that has better performance with minimum weight of the missile. It has a dual mode guidance, initially on command mode from a phased array radar and later radar homing guidance with unique software developed for high accuracy.

The phased array radar provides capability for multiple target tracking and simultaneous deployment of missiles to attack four targets at the same time, in each battery. Multiple batteries constitute a group centre. The system is highly mobile.'

India has already developed under its Integrated Guided Missile Development Program missile like Prithvi, Agni, Trishul and Akash. Until date, only Akash has been fired in the presence of top dignitaries and as one DRDO official put 'it shows the high level of confidence the IAF is putting in the Akash missile system'.

The IAF has already ordered eight squadrons of the Akash missile system at a cost of over Rs 23,000 crores and reports suggest that the system has already been deployed Jorhat, Gwalior, Tejpur, Hashimara, and Pune. It is estimated that DRDO spent close to Rs 1000 crore in the R&D of this missile system. A comparable foreign system would be ten times more costly to purchase than the Indian made system.

According to estimates by the DRDO thanks to its contribution India's defence R&D today the country is just one of the 5 countries to have its own ballistic missile defence program; one of the 6 countries to have developed a nuclear- powered submarine; one of the 7 countries to have developed its own main battle tank and an indigenous 4th gen combat aircraft.

The production value of systems based on DRDO technologies that have been inducted and or approved for induction into services during the past decade (excluding strategic systems) stands at over Rs 1,70,000 crores.

It is not easy to do research and development of high-grade weapons systems and DRDO says often it is unfairly targeted of its delays and inefficiencies when actually the acquisitions lobby tries to scuttle local development. This showcasing of the missile systems and the Tejas plane at Pokhran in

way suggests the coming of age of the 'made in India' platforms even as lobbies push for the 'make in India' effort. The difference is subtle but the implications huge especially in times of war.

Army Technology.com
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Nag Anti-Tank Guided Missile, India

Nag is a third-generation, fire-and-forget, anti-tank guided missile developed by India's state-owned Defence Research and Development Organisation (DRDO) to support both mechanised infantry and airborne forces of the Indian Army.

The missile incorporates an advanced passive homing guidance system and possesses high single-shot kill probability. It is designed to destroy modern main battle tanks and other heavily armoured targets.

Nag can be launched from land and air-based platforms. The land version is currently available for integration on the Nag missile carrier (NAMICA), which is derived from a BMP-2 tracked infantry combat vehicle.

The helicopter-launched configuration, designated as helicopter-launched NAG (HELINA), can be fired from Dhruv advanced light helicopter (ALH) and HAL Rudra (ALH WSI) attack helicopter.

Development

The Nag missile was indigenously developed under the Indian Ministry of Defence's integrated guided missile development programme (IGMDP), which also involved the development of four other missiles that are Agni, Akash, Trishul and Prithvi.

Bharat Dynamics (BDL) produced imaging infrared seekers for the weapon.

The first test of Nag was conducted in November 1990. A test launch of the missile from a tube in programmed control mode was performed at the Interim Test Range, Balasore, Odisha in September 2001.

Two Nag missiles were successfully test fired in June 2002.

User trials of the Nag anti-tank missile against static and moving targets were conducted in 2007 and 2008 respectively, while the development tests were concluded in August 2008.

Seeker evaluation tests for the missile were conducted at the Pokhran Test Range in Rajasthan in July 2013. Tests on the HELINA were carried out at the Chandan Firing Range in Rajasthan in July 2015.

A Nag weapon with a modified seeker successfully destroyed a thermal target system (TTS) at a range of 4km during test firing conducted in the Mahajan Field Firing Range, Rajasthan, in January 2016.

The anti-tank missile took part in the Bahrain International Airshow in Bahrain in January 2016. It will undergo final user trials under different weather conditions in 2016.

Nag anti-tank guided missile design and features

The Nag anti-armour guided weapon's airframe is built with lightweight and high-strength composite materials. The missile features top-attack capability and has high immunity to countermeasures.

The missile is equipped with four foldable wings and has a length of 1.85m, diameter of 0.20m, wing span of 0.4m and weight of 43kg.

A blunt nose cone houses the guidance system, while the middle portion accommodates a compact sensor package and the main charge of the warhead. A booster rocket motor is located towards the rear. Four tail fins are fitted at the rear to stabilise the missile while in flight.

A real-time image processor with fast and efficient algorithms is installed next to the guidance section to provide automatic target detection and tracking capabilities. The digital autopilot offers guidance, stability and control for the missile during the flight.

Nag is also outfitted with an electric actuation system for flight control.

Guidance and warhead

A passive imaging infrared (IIR) homing seeker guides the missile to the target after its launch in all lighting conditions. The missile can be optionally offered with a millimetre wave active radar seeker.

The Namica variant has lock-on-before launch capability, while the air-launched configuration uses lock-on after launch technology.

An 8kg tandem-shaped charge high-explosive anti-tank (HEAT) warhead, with a precursor and a main charge, provides the weapon with a high kill probability.

The precursor charge penetrates the explosive reactive armour (ERA) of the tanks and the main charge is intended to destroy the main armour.

Propulsion and performance of Nag guided weapon

The Nag anti-armour guided missile is fitted with a high-energy propulsion system consisting of booster and sustainer propellants. The sustainer propellant burns a nitramine smokeless extruded double base (EDB).

The weapon can fly at a speed of 230m/s and has the capability to engage both static and moving targets under all weather conditions during the day and at night. The range of the land version is 4km, while HELINA can reach up to 7km.

NAMICA launcher

"Nag can be launched from land and air-based platforms."

Up to eight ready-to-fire missiles can be carried in two quadruple armoured box launchers mounted on the NAMICA anti-tank guided missile.

Each launcher can fire four missiles in one minute. The NAMICA vehicle can be optionally equipped with an additional four missiles.

The Global Missiles and Missile Defence Systems Market 2011-2021

This project forms part of our recent analysis and forecasts of the global missiles and missile defence systems market available from our business information platform Strategic Defence Intelligence.

Matrubhumi
27 Mar, 2016

DRDO to hand over Sonar Dome to Mazgaon Docks

The Defence Research and Development Organisation (DRDO) will hand over a massive bow-mounted Sonar Dome to Mazgaon Docks, Mumbai during the DefExpo here. The dome developed by DRDO's Pune-based Research & Development Establishment (Engineers) will be flagged off by Defence Minister Manohar Parrikar on March 29.

Goa: The Defence Research and Development Organisation (DRDO) will hand over a massive bow-mounted Sonar Dome to Mazgaon Docks, Mumbai during the DefExpo here. The dome developed by DRDO's Pune-based Research & Development Establishment (Engineers) will be flagged off by Defence Minister Manohar Parrikar on March 29.

DRDO claims that the Sonar Dome is a first of its kind in the country, manufactured by using 'composites from an India company.'

Ministry of Defence terms the achievement as a huge contribution by Indian industry towards the Make in India movement. Only a couple of companies worldwide have the capability of realising such structures, says MoD.

Giving details of DRDO's dome, MoD says all anti-submarine warfare (ASW) ships have a sonar array fitted to the ship structure below the waterline. "The sonar functions as the ship's underwater eyes and ears. The dome is a structure fitted over the sonar array so that its electronics and sensors are not exposed to surrounding hostile environment. The sonar dome has to be structurally sound as well as acoustically transparent," says an MoD Spokesperson.

R&DE(E) Pune has been playing a silent role for a number of DRDO programmes over the years. For DRDO's Shore-Based Test Facility (SBTF) in Goa, the lab played a critical role along with other stake-holders. DRDO now hopes that the efforts of developing Composite Material Technologies in India would benefit its missiles programmes.

"We have been working on composites for some time now. We have also involved Indian industry and academia to make breakthrough in this area," says an official from DRDO's Missile Complex.

In a related development, DRDO sources told Mathrubhumi that two naval variants of Light Combat Aircraft have left Bengaluru on Sunday. The NLCA NP-1 and NP-2 are headed for Goa to undertake SBTF trials. One platform may be participating during the flypast on the inaugural day," says an official.

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DRDO to Hand over Sonar Dome to Defence Minister

Goa will have its own proud moments during the prestigious Defexpo being held at Quitol, Goa apart from hosting the mega event first time outside Delhi.

A huge bow mounted Sonar Dome designed & developed by Research & Development Establishment (Engineers) [R&DE(E)], a DRDO laboratory based in Pune is going to be flagged off by Defence Minister Shri Manohar Parrikar, Secretary Department of Defence (R&D) & DG DRDO Dr. S. Christopher will also be present on this important occasion. The ceremony will be held at Defexpo site in Goa on March 29, 2016. The Sonar dome will be delivered to Mazgaon Docks, Mumbai.

The Sonar Dome, a first of its kind in the country has been manufactured by a composites manufacturing company in India. This is a huge contribution by Indian Industry to the Make in India movement. Only a couple of companies worldwide have the capability of realising such structures.

All anti-submarine warfare (ASW) ships have a sonar array fitted to the ship structure below the waterline. The sonar functions as the ships underwater eyes and ears. The sonar dome is a structure fitted over the sonar array so that its electronics and sensors are not exposed to surrounding hostile environment. The sonar dome has to be structurally sound as well as acoustically transparent.

R&DE(E), DRDO, Pune has successfully developed process technologies to realise large composite structures that can be used in Naval ships & submarines. The Laboratory has also developed technologies related Integral Composite Armour that can be used in Combat Vehicles. The Laboratory is also significantly contributing in development of aerospace structures. NPOL, a DRDO Laboratory at Kochi played a significant role in development of the Sonar Dome.

It is prudent to mention that Composite Material Technologies relevant to Indigenously developed Missiles have already been well established.

DRDO is also fielding Live Demonstration of number of Systems with Cutting Edge Technologies for the first time in Defexpo.

Defense Minister to flag off Sonar Dome developed by DRDO on Mar 29

Defense Minister Manohar Parrikar will flag off a huge bow mounted Sonar Dome designed & developed by Research & Development Establishment (Engineers) [R&DE(E)], a DRDO laboratory based in Pune, on March 29 at Defense Expo 2016 which will be inaugurated at Naqueri Quitol in Quepem Taluka of South Goa, tomorrow.

According to a statement here today, after the flagging off ceremony the sonar dome will be delivered to Mazgaon Docks, Mumbai. Dr S Christopher, Secretary, Department of Defense (R&D) and DG DRDO will remain present during the programme.

The Sonar Dome, a first of its kind in the country has been manufactured by a composites manufacturing company in India. This is a huge contribution by Indian Industry to the 'Make in India' movement. Only a couple of companies worldwide have the capability of realising such structures. All anti-submarine warfare (ASW) ships have a sonar array fitted to the ship structure below the waterline. The sonar functions as the ship's underwater eyes and ears. The sonar dome is a structure fitted over the sonar array so that its electronics and sensors are not exposed to surrounding hostile environment. The sonar dome has to be structurally sound as well as acoustically transparent.

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