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## **Tata Power scrip's rise anticipates major army order**

*By Ajai Shukla*

The Tata Power scrip perplexed analysts on Tuesday by jumping around four per cent on the BSE. This came a day after the company announced it had won a small order from the Border Security Force (BSF) for "cooled hand held thermal imagers" (HHTIs) that troopers on border outposts will use to watch the border fence, both by day and night.

The order for just 40 units won by the company's strategic engineering division (Tata Power SED) - worth barely Rs 20 crore, at about Rs 50 lakh per piece - hardly explains such euphoria (stock market gains were pared slightly on Wednesday). Nor does an anticipated follow-on order for about 400 more HHTIs, worth Rs 150-200 crore, which the home ministry is processing and is likely to clear by July, say ministry sources.

*Business Standard* learns that the optimism stems from the company's leap into pole position in the race for the much larger army requirement of 4,000 HHTIs, worth Rs 1,500-2,000 crore, for surveillance of the 776-kilometre line of control (LoC) with Pakistan. Additionally, the army needs HHTIs to enable its heavy armoured vehicles to drive at night without lights.

Army sources say the HHTIs chosen by the BSF are superior to, and significantly cheaper than, the equipment it has been evaluating since 2010. The department of defence production (DDP) has been pushing the army to buy the HHTI offered by the Defence Research & Development Organisation (DRDO), and built by Bharat Electronics Ltd (BEL), both work under the DDP.

The DRDO-BEL devices use Israeli infra-red (IR) tubes, with a 320 x 280 format, and a 20 um pixel pitch. In comparison, the Tata Power device, which the BSF has selected, uses a 640 x 480 format, with a 15 um pixel pitch. Like common digital cameras, a smaller pixel size enables the more detailed information to be packed into the same size of photograph.

Given this advantage, and standing instructions to support 'Make in India', and the army's inherent need for life-cycle support for its HHTI devices, the generals are veering around towards Tata Power's product. A cooled HHTI consists of two viewing devices: an optical daytime sight, and an IR sight for nighttime. Complex, on-board data fusion equipment amalgamates the images received from both sights for greater clarity. In addition, there is an inbuilt radio transmitter that transmits the final image, in real time, from the border fence where the HHTI is often installed to a command post that could be several kms away.

Tata Power SED sources say their breakthrough stems from indigenising the data fusion algorithm, obtaining sharper, clearer images of the surveillance area.

In the BSF trials, Tata Power competed against two other offerings. One, by a highly-regarded Indian imaging start-up called Tonbo Imaging, which provided high-quality images but failed on the radio equipment needed to transmit it. The other competitor, BEL, provided adequate radio equipment, since it builds most of the army's requirement of radios, but its HHTI failed to develop a passable image.

A major gap in indigenising cooled HHTIs exists in thermal imaging IR tubes, which Indian companies import. Tata Power's HHTIs incorporate IR tubes from French company, Sofradir. However, company sources indicate that, if it wins the large army order, there will be a compelling business case for a joint venture with Sofradir to manufacture IR tubes in India. The army has been seeking to mitigate its "night blindness" with two types of sensors: first, thermal-imaging (TI) devices, which create an image of a target using a temperature gradient. The second type are image intensification (II) devices, which magnify ambient light. Earlier, "active infra-red devices" were

used, which flashed out an IR beam and viewed the target from the reflected IR light. Active devices are now obsolescent, since they give away one's own position.

*The Tribune*  
*05 May, 2016*

## **Air Force to revive 24 British-era airfields**

The Indian Air Force (IAF) will revive 24 British-era airfields, which have fallen into disuse, to build secured locations for planes and missile batteries.

Most of these airfields are in the eastern and north-eastern regions of the country from where a part of the allied forces (the UK and the US) attacked the rampaging Imperial Japanese Army in Burma during the World War-II.

The 24 airfields will have proper fencing and be given station names with teams being posted there to man the area. The IAF plans to use these as emergency landing grounds in case of a war and disperse its assets such as planes, missile batteries etc to protect these from enemy fire.

Sources said the IAF ordered a survey to identify airfields that could be used in future. Some of these airfields are in remote areas. These were created by the allied forces or the British. The IAF studied each airfield and its ownership before drawing up a revival plan.

The country has more than 100 such airfields, of which the IAF owns 39. The remaining are with the Army, the Navy and the Airports Authority of India.

The Ministry of Defence has suggested that the airfields, which are near tourist places and are not serving any military purpose, be handed over to the state governments.

Yesterday, the Parliamentary Standing Committee in its report tabled in both Houses noted: "These (airfields) will be used as radars stations, weapon storage areas (WSAs), and emergency recovery strips for helicopters and fixed-wing aircraft."

The committee, headed by Maj Gen BC Khanduri (retd), a BJP MP from Uttarakhand, has suggested that work on these airfields should be started without further delay and the remaining 15 airfields be assessed for being used.

Besides, the IAF and the Army are constructing full-fledged paved landing strips at Tuting, Mechuka, Along, Vijayanagar, Tawang, Walong and Ziro in Arunachal Pradesh. A sum of Rs 355 crore has been allocated for developing these British-era landing grounds in Arunachal Pradesh. Two of these have been completed.

*IDRW*  
*04 May, 2016*

## **Indian Navy to bid adieu to Sea Harriers on May 11 in Goa**

The Indian Navy will de-induct its ageing Sea Harriers, replacing them with MiG 29K fighter aircraft, on May 11 at INS Hansa base in Vasco at Goa. "With the scheduled decommissioning of INS Viraat and great difficulty in maintenance of the ageing Sea Harrier fighters, they are scheduled to be de-inducted on May 11, 2016.

The squadron will be operating the advanced MiG 29K fighters," the Navy said in a statement here today. Admiral R K Dhowan, Chief of the Naval Staff will be the Chief Guest for the ceremony. The Sea Harriers were inducted in the Indian Navy following phasing out of then obsolete Seahawks.

"In November 1979, post government approval, Naval HQ placed an order for 06 Sea Harrier FRS Mk 51 fighters and 02 T Mk 60 Trainers, for delivery in 1983," a naval spokesman said. "In

September 1980, Sea Harrier Project (SHARP) was formed with select naval aviators and technical personnel for coordination of trials, testing, acceptance and training.

The first newly-built Sea Harrier for the Indian Navy (IN 601) was ready on December 21, 1982. The first three Sea Harriers flying via Malta, Luxor and Dubai, led by Lt Cdr Arun Prakash VrC, landed at Dabolim on December 16, 1983.

This was followed by first deck landing on the carrier, INS Vikrant, on December 20, 1983 and the arrival of the first Sea Harrier T Mk 60 trainer, on March 29, 1984," the spokesman said. He said the reborn white tigers of the Indian Navy were now a totally professional outfit and came out with flying colours during frequent embarkations, joint exercises, Dissimilar Aircraft Combat Training and Air to Air gunnery exercises.

"The squadron was embarked on the carrier during Operations Vijay and Parakram providing the essential offensive posture to the country and ensuring readiness to react to any escalation by the enemy," he said. "In last few years the Harriers have added a new dimension to their operations with the increased multinational exercises in which the Indian Navy participates," the spokesman stated.

"These exercises have seen the Harriers facing eye-to-eye with the best in the business. The magnificent carriers and the flying machines of the American, French and British Navies have come, exercised and gone back suitably impressed.

"Always operating with modest equipment and resources, yet coming out with extraordinary results, the white tigers have built an enviable reputation for themselves and continue to remain at the forefront of Indian Naval Aviation," he said.

"The Sea Harriers had undergone a weapon and avionics upgrade since 2007 to match up with any opposition. The upgraded Sea Harrier christened LUSH (Limited Upgrade Sea Harrier) was a shot in the arm for the Indian Naval aviation," the naval spokesman stated.

"The Sea Harriers, in their 'new avatar', were a formidable force to reckon with. LUSH aircraft, with their new inventory of armament were ever ready for the present day Beyond Visual Range environment in which modern aircraft operate," he claimed. "Post limited upgrade in which the aircraft was fitted with a new Multimode Radar, Beyond Visual Range (BVR) missile and a Datalink, the Sea Harrier fleet had redeemed itself as the best carrier borne 'air defence fighter/interceptor' in the Indian Ocean Region.

"The flexibility offered by the aircraft's capability to undertake short/vertical takeoffs and landings had enabled it to operate from any fixed wing carrier and had regularly conducted cross deck landings on ships of foreign navies," the Navy said. "These exercises have seen the Harriers facing eye-to-eye with the best in the business.

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*Deccan Herald*  
05 May, 2016

## **US refuses Pak subsidy on F-16**

Washington: The United States has told Pakistan it will have to finance the purchase of American F-16 fighter jets itself after members of the US Congress objected to using government funds to pay for them.

The US government said in February it had approved the sale to Pakistan of up to eight F-16 fighter jets built by Lockheed Martin Corp, as well as radar and other equipment in a deal valued at \$699 million.

However, Republican Senator Bob Corker said he would use his power as chairman of the Senate Foreign Relations Committee to bar use of any US funds for the deal to send a message to Pakistan that it needed to do more in the war against militants. Corker's stance reflected deep unhappiness among both Democrats and Republicans in Congress about what they see as Islamabad's policy of supporting elements of the Taliban and the Haqqani network blamed for attacks in Afghanistan.

Members of Congress also raised the possibility of the fighter jets being used against Pakistan's neighbor India, with whom it has fought three wars. India objected to the deal.

Pakistan's military says the F-16s it already owns have been integral in fighting the Pakistani Taliban and its allies in the country's tribal areas, particularly due to the aircraft's precision strike and night-flying capability.

US State Department spokesman John Kirby said congressional opposition meant funds from the US government's Foreign Military Financing allocation could not be used to buy the aircraft. "We have told the Pakistanis that they should put forward national funds for that purpose," he told a regular news briefing.

*Deccan Herald*  
05 May, 2016

## **IS may be making chemical weapons, warns watchdog**

The Hague: There are "extremely worrying" signs that the Islamic State group may be making its own chemical weapons and may have used them already in Iraq and Syria, a global watchdog said Tuesday.

The head of the Organisation for the Prohibition of Chemical Weapons, Ahmet Uzumcu, said his body's fact-finding teams have found evidence of the use of sulphur mustard in attacks in the two countries.

"Although they could not attribute this to Daesh... there are strong suspicions that they may have used it (chemical weapons)," Uzumcu told AFP, using the alternative name for the jihadist group.

"Secondly the suspicions are that they may have produced it themselves, which is extremely worrying," Uzumcu said on the sidelines of a three-day conference at the OPCW's Hague-based headquarters.

"It proves that they have the technology, know-how and also access to the materials which might be used for the production of chemical weapons," Uzumcu said.

*The Pioneer*  
05 May, 2016

## **Rare Celestial Crossing on May 9**

Much to the delight of sky-watchers, a rare celestial crossing is all set to enthrall them on Monday, May 9, as they will be able to see Mercury make its way across the surface of the sun.

The so-called transit of Mercury occurs only about 13 times every century, and the next one won't take place until 2019, say the astronomers. The transit will start at 4.40 pm IST and will last for 5 hours. However, from India, the transit of Mercury over the disc of the sun will be visible from afternoon. This is happening after a gap of about ten years.

To reachout to the interested public, The Public Outreach and Education Committee of the Astronomical Society of India has created resources for them which are available on its website (<http://bit.ly/tom-india>). Infact, many astronomy clubs across the country are organising public viewing of the transit through their telescopes at various locations. One can visit the website and find out the nearest place to view the rare event, said Samir Dhurde from Inter-University Center for Astronomy & Astrophysics (IUCAA).

The transit of Mercury is a phenomenon in which the planet will be seen as a small black dot travelling from one end of the solar disc to the other. This phenomenon is seen when mercury passes between the sun and the earth and it happens only when the three are lined up.

Mercury appears as a dot on the solar disc because its angular size is very small compared to that of the sun as seen from earth.

The transit of Mercury is relatively a rare phenomenon, occurs 13 or 14 times in a century, mostly in the months of May and November.

The ASI is the professional body of all astronomers in the country. The Public Outreach and Education

Committee was set up by it to promote awareness and understanding of astronomy in India, said Dr N Rathnasree from Delhi-based Nehru Planetarium.

*Deccan Herald*  
05 May, 2016

## **'Planet Nine' may not exist, says study**

Washington: Scientists have found that there is low probability of the existence of the mysterious 'Planet Nine', a Neptune-mass world that may circle our Sun at a distance of about 64 billion to 225 billion kilometres.

Earlier this year scientists presented evidence for Planet Nine, leaving theorists puzzled over how this planet could end up in such a distant orbit.

"The evidence points to Planet Nine existing, but we can't explain for certain how it was produced," said lead author Gongjie Li, Harvard-Smithsonian Centre for Astrophysics (CfA).

Planet Nine circles our Sun at a distance of about 64 billion to 225 billion km, or 400-1,500 astronomical units.

This places it far beyond all the other planets in our solar system.

Researchers conducted millions of computer simulations in order to consider three possibilities. The first and most likely involves a passing star that tugs Planet Nine outward.

Such an interaction would not only nudge the planet into a wider orbit but also make that orbit more elliptical. Since the Sun formed in a star cluster with several thousand neighbours, such stellar encounters were more common in the early history of our solar system.

However, an interloping star is more likely to pull the planet away completely and eject it from the solar system. Researchers find only a 10 per cent probability, at best, of Planet Nine landing in its current orbit. The planet would have had to start at an improbably large distance to begin with. Using computer simulations, researchers studied plausible scenarios for the formation of Planet Nine in a wide orbit.

"The simplest solution is for the solar system to make an extra gas giant," said CfA astronomer Scott Kenyon. Researchers propose that Planet Nine formed much closer to Sun and interacted with gas giants like Jupiter and Saturn. A series of gravitational kicks then could have boosted the planet into a larger and more elliptical orbit over time.

"Think of it like pushing a kid on a swing. If you give them a shove at the right time, over and over, they'll go higher and higher," said Kenyon.

"Then the challenge becomes not shoving the planet so much that you eject it from the solar system," he said.

*Deccan Herald*  
05 May, 2016

## **New hope for Alzheimer's patients**

New York: A drug which is already being used to treat a neurological disorder may also be able to reverse genetic changes behind Alzheimer's disease, a new study has claimed.

Ageing takes its toll on the brain, and the cells of the hippocampus - a brain region with circuitry crucial to learning and memory - are particularly vulnerable to changes that can lead to Alzheimer's disease or cognitive decline. The drug, riluzole, is capable of reversing key genetic changes associated with these conditions, researchers said.

"In ageing and Alzheimer's, the chemical signal glutamate can accumulate between neurons, damaging the circuitry," said Ana Pereira from Rockefeller University in the US.

"When we treated rats with riluzole, we saw a suite of changes. Perhaps most significantly, expression of molecules responsible for clearing excess glutamate returned to more youthful levels," said Pereira.

Generally, glutamate is released to excite other neurons and does not linger in the spaces between them.

As we age, though, the system gets a little leaky and glutamate can build up in these intercellular spaces, researchers said.

This happens in part when neurons make less and less of the transporter molecule responsible for removing excess glutamate, they said. When it accumulates, this essential neurotransmitter can cause big problems, damaging or killing neurons and so contributing to Alzheimer's disease, and other disorders.

"The essence is we used a drug known to modulate glutamate, and when we gave it to old rats, we saw it reversed many of the changes that begin in middle age in the hippocampus," said Jason Gray from Rockefeller University.

"We saw a similar pattern when we compared the riluzole-induced changes to data from Alzheimer's patients - in a number of key pathways in the hippocampus, the drug produced an effect opposing that of the disease," said Gray.

The drug modifies the activity of certain genes in an aged animal to resemble that of a younger rat.

For example, researchers found that the expression of a gene called EAAT2, which has been linked to Alzheimer's and is known to play a role in removing excess glutamate from nerve fibres, declines as the animals age. However, in rats treated with riluzole, this gene's activity was brought back to its youthful levels. In addition to its potential ability to allay memory loss and cognitive decline, riluzole is attractive as a potential treatment for Alzheimer's, researchers said.

The drug is already being used to treat another neurological disease, amyotrophic lateral sclerosis, and is therefore considered relatively safe, researchers said.

"We hope to use a medication to break the cycle of toxicity by which glutamate can damage the neurons that use it as a neurotransmitter, and our studies so far suggest that riluzole may be able to accomplish this," said Pereira.

The findings were published in the journal *Molecular Psychiatry*.

*The Asian Age*  
05 May, 2016

## **Scientists win \$3 million for Einstein's waves**

Researchers who helped detect gravitational waves for the first time, confirming part of Albert Einstein's theory in a landmark moment in scientific history, will share a \$3 million Special Breakthrough Prize, according to the prize's selection committee.

The Breakthrough Prizes for scientific achievements were created by Russian billionaire Yuri Milner along with several technology pioneers, including Facebook founder Mark Zuckerberg and Google co-founder Sergey Brin.

In February, a team from the Laser Interferometer Gravitational-Wave Observatory (LIGO) announced a pair of giant laser detectors had measured the tiny ripples in space and time first theorized by Einstein a century ago, capping a decades-long quest. Einstein predicted gravitational waves as part of his seminal theory of general relativity, which explained gravity as distortions in both space and time caused by bodies of matter.

LIGO's three founders - Rainer Weiss, Kip Thorne and Ronald Drever, who dedicated much of their careers to gravitational wave detection - will share \$1 million. More than 1,000 contributors to the project will also split \$2 million equally.

"That's much more modern and much more the way that physics gets done," said Weiss, a professor emeritus at the Massachusetts Institute of Technology, of the decision to honor the entire team. "You can't credit just the three of us for this."

Researchers said the gravitational waves came from the collision of two black holes, the extraordinarily dense objects that Einstein's theory also predicted. The black holes, both many times the mass of the sun, were located 1.3 billion light years from Earth. The waves should unlock new ways to understand the cosmos, including black holes, neutron stars and the mysteries of the early universe.

"For us to spend basically a half-century since the three of us started working in this field, to have it actually be pulled off successfully in the manner we dreamed - it was really remarkable and wonderful," said Thorne, who is retired from the California Institute of Technology. "I'm forever grateful to the team that got it done."

The winners will be honored at a December ceremony, when the regular annual awards for physics, life sciences and mathematics will also be announced. The Special Breakthrough Prize can be conferred at any time to mark "an extraordinary scientific achievement."

Edward Witten, a prominent physicist who heads the physics prize selection committee, said the discovery's magnitude warranted immediate recognition.

"There are a lot of basic things about Einstein's theory of relativity that seemed like science fiction when I was a student," Witten said. "This is the first time we've seen the full force of Einstein's theory of gravity at work."-----*Reuters*

*The Hindustan Times*  
05 May, 2016

## AUTISM, CANCER AND SHARED GENES

**43 specific genes associated with autism are also linked to cancer, a finding that could lead to repurposing some cancer drugs to treat autism spectrum disorder, which currently has no cure**



### WHAT IS AUTISM SPECTRUM DISORDER?

**It describes a range of** neurodevelopmental disorders

**These disorders are mainly seen** as deficits in social communication and interaction, repetitive patterns of behaviour, interests or activities

### HOW THE FINDINGS WILL HELP

**The researchers found** the two conditions may have potentially common biological mechanisms

**This means it may be possible** to develop common drugs or repurpose those used for cancer for a range of neurodevelopmental disorders

### WHAT DID THE STUDY FIND?

**The study, published online** in the journal *Trends in Genetics*, found a remarkably large number of genes are implicated in both autism spectrum disorder and cancers

**Among the dozens of genes** are those for relatively rare syndromes too, such as Rett syndrome and tuberous sclerosis, whose sufferers experience physical and neurological symptoms, intellectual disability and communication deficits — all characterised as autism.

## **Kalam memorial at Dilli Haat soon**

A memorial dedicated to former President APJ Abdul Kalam will soon come up at Dilli Haat, INA.

The Delhi Cabinet gave the move a go-ahead on Wednesday and assigned the Delhi Tourism and Transportation Development Corporation (DTTDC) with setting up the memorial. The Department of Art and Culture will be the nodal department for the project, while the Finance Department will arrange for adequate funds, said a statement from the Delhi government.

A month ago, Delhi Tourism Minister Kapil Mishra had travelled to Rameswaram to bring back Mr. Kalam's belongings to the Capital.

The Delhi government now plans to put these on display as part of a permanent memorial to the former President at Dilli Haat in INA. Among the items to be displayed are his books and musical instruments. The memorial will include a permanent exhibition on Dr. Kalam, where his books will be displayed and used for research and other purposes.

After Dr. Kalam's death in July last year, the Central government had sent his personal possessions from his residence at 10, Rajaji Marg here to his family home in Rameswaram, Tamil Nadu. The belongings were later brought back to Delhi in trucks and are to be kept inside the Delhi Assembly till July 27.