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Defence Scientific Information & Documentation Centre
मेटकॉफ हाऊस, दिल्ली 110054
Metcalf House, Delhi-110054

Defence Budget 2017 - Keeping Us Out of Arms' Way

By C Uday Bhaskar

India's budgetary allocation for defence is sizeable: the last fiscal year. But it receives relatively little notice or review, which is symptomatic of matters military in India.

Devoid of the pension outlay, the total defence budget for 2016-17 was Rs. 2,49,000 crore, which is the budget estimate (BE). Today, the finance minister will indicate how much of this budgeted amount was actually spent in 2016-17. This amount is the revised estimate (RE).

The trend for the last two years running has been that the RE has been less than the BE, and the utilisation of the defence budget in 2014-15 and 2015-16 was 95% and 91% respectively.

The second indicator is that over the last three years, BE to BE, the increase in the defence budget from 2014-15 to the current fiscal year as a percentage of the previous year has been reducing from 12.4% to 7.7% to just 1% last year. In actual terms, the defence allocation over the last three years has been Rs. 2,29,000 crore, Rs. 2,46,727 crore and Rs 2,49,099 crore.

In other words, despite a glaring inventory deficiency for the three armed forces, India's higher national security management has not allocated the necessary funds required. Or worse, has not utilised the amount budgeted in an effective manner.

One more trend indicator provides the overall contextual framework for India's defence budget allocation while also illustrating the priority accorded to this sector in the larger national fiscal grid. Over the last eight years, from 2009-10 onwards, the defence expenditure (minus pensions) as a percentage of GDP has steadily declined from 2.19% to 1.65%.

So, over the last three years, the ministry of defence has been unable to utilise the funds allocated; the increase from year to year is declining, as also the total allocation in relation to GDP. This is a macro-trend indicator that does not augur well for the kind of challenges the Indian military faces over the next decade.

Accumulated obsolescence is the major challenge for India's ageing military inventory. Perhaps this year's Republic Day parade offers the most stark indicator. The United Arab Emirates (UAE) contingent led the parade as guests of honour. The manner in which it was kitted and equipped -including personal weapons -was a study in contrast with our contingent.

Suffice it to note that the average Indian infantry soldier is technologically one generation behind his counterpart in the spectrum of modern armies globally.

The management challenge apropos defence allocations gets even more muddled when the capital outlay is disaggregated. This head pertains to the acquisition of new equipment and platforms. The track record of the last year is below the median.

The BE for the capital head in 2015-16 was ₹. 98,175 crore and the RE -the amount actually spent -Rs 85,112 crore. That is, about Rs 13,000 crore (almost \$2 billion) was unspent. This, when the Modi government has prioritised military modernisation and 'Make in India'.

Very often, large sums of money are (mis)appropriated from the ministry of defence in the last lap of the financial year to balance the books, as it were, and to keep the deficit down. One was witness to this last-minute political pressure during the NDA I period when the then defence minister George Fernandes was prevailed upon by his counterpart in North Block to return Rs. 8,000 crore as unspent.

It will be instructive to note what Arun Jaitley will announce today -and the degree to which these trends have been corrected. Hopefully, the last phase of this government will see a transition from arid expenditure control to more productive capacity creation in the armed forces. *The writer is director, Society for Policy Studies*

Safety a priority, city cops to get new bulletproof jackets

By Rajshekhar Jha

2,450 To Be Procured In First Lot; Will Cost Rs 1 Lakh Each

In what can be seen as a confidence-building measure among Delhi Police personnel, the department is learnt to have initiated the process to procure bulletproof jackets. In the first lot, 2,450 superior-quality vests will be procured. Police commissioner Amulya Patnaik is believed to have issued instructions to officers for giving top priority to cops' safety. The department is expected to complete the procurement by April, sources said.

The jackets being bought are of level 3, which will protect the cops from bullets fired from weapons like AK rifles, sten machine guns, MP-5, carbine and Insas. The new vests are likely to cost around Rs 1 lakh each. The existing ones were bought for Rs 40,000 each.


BULLET SHIELD

COMPONENTS
An outer carrier, removable soft armour panels, two hard armour panels made of high performance polyethylene plates/ Aramid fibre/composite material

2,450
bulletproof jackets, level III+

STOPPING POWER

- 1 Shots fired from submachine guns like carbine, MP5 from 5 metres
- 2 NATO ball ammunitions fired through 7.62mm SLR/ bolt action rifle from 10 metres
- 3 Shots fired through AK series rifles from 10 metres
- 4 M-193 bullets from INSAS rifles from 10 metres



TOTAL COVER FROM SOFT ARMOUR PANEL

Front, back (including sides), collar, shoulder and groin

SIZES FOR DELHI COPS

Standard, large, extra large

Explaining the features of the new jackets, an officer said they were water and fireproof. Even exposure to ultra violet ray leaves no impact on them. The vests will be available in "extra large" size apart from large and standard sizes. Last February, TOI had reported how a 90,000-strong police force was managing with only 300 bulletproof vests. Most of them were given to the personnel from the New Delhi district, Special Cell and the crime branch. These jackets are not just outdated but also heavy, weighing around 11kg a piece, an officer said, adding that it was extremely difficult to put on these jackets for hours.

Following the TOI report, the cops had planned to procure 1,000 jackets last year, but the plan did not materialise. The absence of safety gear like bulletproof jackets has exposed the vulnerability of the cops to attacks by criminals and terrorists. While top Mumbai police officer Hemant Karkare fell victim to terrorists' bullets during 26/11, Mohan Chand Sharma of Delhi Police was killed during the 2008 Batla House

encounter.

In 2013, a Delhi court had expressed concerns over the city's ill-equipped cops after which the Delhi Police had begun efforts to procure bulletproof jackets for its personnel.

The police brass woke up to the need to procure more safety gear last January when a cop was gunned down by two criminals on bike in outer Delhi's Alipur. Though senior officers had decided that cops on patrol duty should wear these jackets to protect themselves if attacked by criminals, plans to procure them had been stuck in red-tape in the past year.

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Women on Coast Create History in Combat Role

In a major step towards empowering women and greater gender parity, the Indian Coast Guard has become the first force to deploy female officers in combat roles on board its ships that patrol the country's maritime zone near the borders with Pakistan. The four women who have been deployed in the combat role are posted at the coastal areas bordering Pakistan and Bangladesh, including Jakhau in Gujarat and Haldia in West Bengal.

"These officers have been posted on board the Air Cushion Vehicles, popularly known as hovercrafts, in the Coast Guard and have been trained to handle all types of situations including interception of suspicious activity boats like the MV Kuber, in which terrorists carried out the 26/11 terror attacks," Coast Guard officers told Mail Today here.

Most countries employ women in various roles in their armed forces but only a handful, including Australia, Germany, Israel and the United States, have allowed them to take on fighting, or combat, roles. The aim of training these women is that they should be capable of handling all missions under the Coast Guard charter including boarding suspicious vessels, chasing such boats in the high seas or catching contraband smugglers there, they said. Asked about the deployment of women officers on these hovercrafts, Coast Guard director general Rajendra Singh said, "We are intensely passionate about true inclusiveness and empowerment of lady officers. While the Coast Guard celebrates four decades, as part of our commitment, we have appointed these lady officers in combat roles."

At the hovercrafts, the female officers are deployed along with senior male officers and sailors and carry out the same task that the men are expected to perform. At present, a total of 18 hovercrafts serve in the Coast Guard, attached to units in Okha and Jakhua in Gujarat, Mumbai in Maharashtra, Mandapam in Tamil Nadu, and Haldia in West Bengal. The training of these women was started by the Indian Coast Guard about a year ago at its base at Mandapam with four female officers— assistant commandants Anuradha Shukla, Sneha Kathyat, Shirin Chandran and Vasundhara Chouksey.

These women sail on these hovercraft on both the seaboard and their tribe is set to expand in future as their training progresses. India had for many years kept women away from the frontline, citing concerns over their vulnerability if captured and their physical and mental ability to handle the stress of such deployments.

The Navy, which is the biggest maritime force in the country, does not allow women to sail on board its ships. The Coast Guard started inducting women in combat roles after Prime Minister Narendra Modi in an interaction with military commanders last year urged them to give female officers combat roles and open more avenues for them in the services. Following this, the Air Force started inducting women in combat aircraft flying but that initiative is an experiment and the ladies have not yet joined operational squadrons. When the Coast Guard informed defence minister Manohar Parrikar about the induction of female officers in operational roles, he urged the force to look for more avenues to strengthen women officers there.

The Indian Coast Guard (ICG) was formally established in 1978 by the Coast Guard Act, 1978, of Parliament as an independent armed force of India. It has more than 130 female officers under its command, forming around 10 per cent of the officer cadre there. The women have also been inducted in the flying branch as they independently operate Dornier surveillance planes and Cheetah choppers in the force.

Pak wants peace with India: Army

Pakistan wants peace with India and resolution of all issues, including Kashmir, through talks on the basis of self-respect and honour, the army said today. "We want the Kashmir issue to be resolve via United Nations resolutions and dialogue, but this desire for peace should not be misconstrued as a weakness," Military spokesman Major General Asif Ghafoor told reporters in Rawalpindi.

He said Pakistan wants resolution of all issues through talks on the basis of self-respect and honour. "India is working on a plan and that's why it staged a drama of surgical strike. Armed forces and the people are ready to respond to any misadventure by India," he said. India maintains that its forces last year conducted surgical strikes in Pakistan occupied Kashmir, targeting terrorists and destroying their training camps. Ghafoor said India committed 945 ceasefire violations across the LoC and international border over the past three years.

In response to a question on alleged Indian spy Kulbhushan Jadhav, who is in Pakistani custody, Ghafoor said that his matter will be addressed as per Pakistani laws. Jadhav, who was reportedly arrested in Balochistan after he entered from Iran, has been accused by Pakistan of planning "subversive activities" in the country. Pakistan Army had also released a "confessional video" of Jadhav, who said he was the serving Indian Navy officer. India has acknowledged Jadhav as a retired Indian Navy officer, but denied the allegation that he was in any way connected to the government.

Maj Gen Ghafoor also underlined that Pakistan had stationed 200,000 troops on the western border with Afghanistan as the "strategic threat" was not over as yet. He said the kinetic part of military operation against militants had been completed but Intelligence based Operations and combing operations were going on. "We will continue these operation until any remaining terrorists are eliminated," he said.

He said over 70,000 Pakistanis lost their lives since the launch of war against terror in Pakistan. He said Pakistan was worried over the situation in Afghanistan and would held help Afghans to achieve peace. Army chief General Qamar Javed Bajwa will pay a visit to Afghanistan at a suitable dates, he added.



New US missile shield for South Korea

South Korea's defense chief and his new American counterpart are pushing ahead with the deployment of a US anti-missile system this year despite protests by China.

The allies last year announced the plan to deploy the Terminal High Altitude Area Defense system following atomic and missile tests by North Korea. Han Min Koo and James Mattis reaffirmed the plan in a phone conversation days before the US official visits Asia.

How the incoming administration of Donald Trump will approach the region has raised worries in South Korea and Japan. During his campaign Trump threatened to withdraw US forces from the two countries if they did not step up financial support for their defense. Han and Mattis voiced concern over growing threats from North Korea and agreed on a need "to push ahead with the deployment of the Thaad as planned," defense officials in Seoul said yesterday. Trump and South Korea's acting president, Hwang Kyo-Ahn, agreed on Monday to strengthen defense capabilities. Mattis, on a first overseas tour, arrives in South Korea tomorrow then goes to Japan on Friday.

Northern leader Kim Jong Un said last month his country was in the "final stages" of developing an intercontinental ballistic missile. *Agency France-Press*

Russia makes big military push in Arctic

Nearly three decades after nuclear icebreaker Lenin was taken out of service to be turned into a visitor attraction, Russia is again on the march in the Arctic and building new nuclear icebreakers. It is part of a push to firm Moscow's hand in the High North as it vies for dominance with traditional rivals Canada, the United States, and Norway as well as newcomer China.

Biggest since Soviet fall

Interviews with officials and military analysts and reviews of government documents show Russia's build-up is the biggest since the 1991 Soviet fall and will, in some areas, give Moscow more military capabilities than the Soviet Union once had. The expansion has far-reaching financial and geopolitical ramifications. The Arctic is estimated to hold more hydrocarbon reserves than Saudi Arabia and Moscow is putting down a serious military marker.

Under President Vladimir Putin, Moscow is rushing to re-open abandoned Soviet military, air and radar bases on remote Arctic islands and to build new ones, as it pushes ahead with a claim to almost half a million square miles of the Arctic. Russia is building three nuclear icebreakers, including the world's largest, to bolster its fleet of around 40 breakers, six of which are nuclear. No other country has a nuclear breaker fleet, used to clear channels for military and civilian ships.

Russia's Northern Fleet, based near Murmansk in the Kola Bay's icy waters, is also due to get its own icebreaker, its first, and two ice-capable corvettes armed with cruise missiles. The build-up is causing jitters elsewhere. Some 300 U.S. Marines landed in Norway this month for a six-month deployment, the first time since World War Two that foreign troops have been allowed to be stationed there. And with memories of Russia's 2014 annexation of Ukraine's Crimea still fresh, the North Atlantic Treaty Organization (NATO) is watching closely. Six of its members held an exercise in the region in 2015. — Reuters



Wed, 01 Feb, 2017

Iran Tests New Missiles

IN A direct challenge to Trump, Iran carried out a test launch of a mediumrange ballistic missile on Sunday which exploded after 630 miles, a US official said on Monday.

The official said the test launch was carried out from a site near Semnan, 140 miles east of Tehran. The last time this type of missile was test launched was in July 2016.



Wed, 01 Feb, 2017

May not be what it seems

By Andrew griffin

Experts have said that two harvard university physicists might have made a mistake in claiming to have turned hydrogen into a metal.

The scientists who claim to have crushed hydrogen into a metal might have made one important mistake, according to experts. Two physicists claimed that they had finally succeeded in a feat that scientists have been

attempting for almost a hundred years — crushing hydrogen and turning it into metal through an “alchemical” process. Such a discovery would potentially revolutionise technology and space travel, and has been hailed as one of the biggest breakthroughs in history.

But experts have cast doubts on the claims of the two scientists, Ranga Dias and Isaac Silvera, both physicists at Harvard University. They might have mistaken something else for the important metal, a number of other scientists have said. The Harvard researchers first posted their work to arXiv, a website that collects scientific studies before they are published through peer-reviewed journals, in October. At that point it attracted huge amounts of criticism from other scientists who argued that it was based on a mistake.

But the paper was published recently in the journal *Science* all the same, heralding a succession of headlines that claimed that humanity had made a huge breakthrough that could shed light on some of the central questions of the universe. The news was covered in a range of newspapers and websites, including *The Independent*. But five different experts have told *Nature*'s news reporters that they don't believe the claim and that it could be based on an error. One scientist told the news organisation that the paper isn't “convincing at all”. To do the research, the scientists crushed tiny bits of hydrogen beneath diamond anvils, exerting more pressure on it than is found at the centre of the Earth.

Small steps forward have been made through the work but researchers have yet not been able to show off the shiny metal that would be expected to be seen. That is what the two Harvard scientists claimed to have done. But they cannot yet show off the piece of metal because it is still stuck between the jaws of the anvil — and they say that removing it might cause it to disappear entirely. The researchers believe, however, that the reflective and shiny material they can see crushed in the anvil is metallic hydrogen. One of the scientists, Silvera, said that when looking through a microscope at the sample it looked to be shiny and so “you can only believe (it) is a metal”. But other researchers have said that they don't necessarily believe that it is a metal.

The shininess may be something else entirely — like aluminium oxide, which is known to coat the diamonds that sit in the anvil and may become shiny under high pressure. Scientists have also cast doubts on the amount of pressure that the paper claims to have pushed onto the hydrogen. The researchers didn't take detailed enough measurements throughout the process and so it's hard to see whether they were pushing as hard as they claimed onto the hydrogen. Even before the paper was criticised, other researchers have criticised the lab's approach and methods, arguing that it could lead to false positives. Scientists have also questioned why the team published their results before they have taken the material out of the anvil, and will get to work on doing other experiments. But the researchers claimed in press materials that they had done so in order to publicise their “breakthrough event”, and that further experiments would shed more light.



Wed, 01 Feb, 2017

Researchers employ laser light to speed up electronics

Indian part of team that generated very high frequency current in solid material

A researcher from India has taken the first definitive step to produce high-speed electronic devices that can operate one million times faster than modern electronics.

At the Max Planck Institute of Quantum Optics in Garching, Germany, Manish Garg and other researchers used laser light to generate very high frequency electric current inside a solid material. The electrons were found to be moving at a speed (frequency) close to 10^{15} (one million billion) hertz; the best achievable speed in modern transistors is only 10^9 (one billion) hertz. The results were published in *Nature*.

Conventionally, the motion of electrons (conductivity) is achieved by applying voltage. But Dr. Garg and others controlled the motion of electrons inside the solid material by using laser pulses.

“Light waves are electromagnetic in nature and have very high oscillation frequency of electric and magnetic fields. This ultra-high frequency of light waves can be used to drive and control electron motion in

semiconductors. Electronics, when driven by such light waves, will be inherently faster than current state of electronics,” says Dr. Garg, who is the first author of the paper.

Nanofilm electrons

“When we shine high-intensity laser on silicon dioxide, nanofilm electrons are generated. When the electrons move in the presence of electric field of the laser, it generates current,” he says. “Initially, the nanofilm behaves like an insulator, but when we shine high-intensity laser, it behaves like a conductor. The conductivity increases by more than 19 orders of magnitude in the presence of laser pulse.”

The performance of high-speed circuits rely on how quickly electric current can be turned on and off inside a material. “We showed that we could turn the conductivity of silicon dioxide nanofilm from zero to very high values in a time interval of 30 attoseconds (an attosecond is 1×10^{-18} of a second), which is one million times faster than modern electronics” he says.

The very short time interval needed to turn silicon dioxide from an insulator to a conductor was possible as the team used high-intensity and extremely short laser pulses and silicon dioxide in the form of a nanofilm. In the bulk form, silicon dioxide tends to get damaged by high-intensity laser as the material tends to accumulate heat produced by the laser pulse. But as a nanofilm, silicon dioxide becomes nearly transparent to laser and absorbs less heat and therefore gets less damaged.

Measuring current

“In our earlier work, which was also published in *Nature*, we obtained signatures of very high frequency current, but we were not able to measure it. But, now, we are able to measure current in real time by measuring the time-structure of emitted extreme ultraviolet radiation using an attosecond streak camera,” he says. Current produced in the nanofilm manifests as extreme UV radiation.

“We envision that in future, we will be able to use transistors driven by laser pulses instead of electronic transistors in devices. The technical challenge is to make use of high frequency currents to perform logic operations similar to the ones performed inside an electronic transistor and also make it feasible on integrated chips,” Dr. Garg says.