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Sat, 26 Nov, 2016

Pak fire has stopped in last 2 days: Parrikar

Defence Minister Manohar Parrikar Friday said the firing from across the border had stopped in the last two days as the enemy was feeling the heat of retaliation.

“After the surgical strike, the cowardly attacks continued which were retaliated strongly by our armed forces on the border. Our response to their attacks was strong. The day before yesterday we got a call from them pleading us to stop the retaliation,” Parrikar said, referring to request for Dgmo-level talks from Pakistan.

He was speaking at a rally at Sankhalim village in Goa.

“We told them that we don’t mind stopping (the counter attacks) as we are not interested in it, provided they too stop it. For last two days, the firing has stopped from across the border,” the Defence Minister said.

“The government allowed the Army to enter POK and teach lesson to those involved in the cowardly act against our forces,” he said, referring to the surgical strike after Uri attack.

Business Standard

Sat, 26 Nov, 2016

Army initiates contracts with private firms for ammunition

By Ajai Shukla

The army has issued a Request for Information (RFI), inviting Indian industry to respond to a proposal for manufacturing ammunition in the country.

“The purpose of the RFI is to facilitate preparation of Request for Proposal (RFP) and identify prospective manufacturers for participating in the proposal for indigenous manufacture of ammunition”, says the document, which is posted on the government’s Central Public Procurement Portal.

The RFI, and the forthcoming RFP, highlights the difficulties faced by the ministry of defence (MoD) in identifying “strategic partners” (SPs) — private firms designated as the preferred production agencies for manufacturing various categories of defence equipment like aircraft, warships, submarines, ammunition and others.

So contentious has been the formulation of a MoD policy for identifying “strategic partners” that the Defence Procurement Policy of 2016 (DPP-2016) was issued earlier this year without a Chapter 6 — which was to be the strategic partner policy. It remains a blank space in the DPP to this day.

Private sector defence firms, which regard being nominated as a strategic partner an essential first step to entering the lucrative defence business, have competed fiercely to mould the policy to suit their own candidatures. Adding to the difficulty has been bureaucratic reluctance to nominate strategic partners — because of concern over future allegations of bias, and the possibility of getting embroiled in investigations.

Now, after discussions at the Prime Minister’s Office (PMO), the MoD has chosen to bypass the issue of nominating strategic partners for manufacturing ammunition. Instead there is the appearance of competition, involving the issue of an RFI and RFP.

Yet, the RFI contains a strategic partner-style, long-term component, that says: “The ammunition is proposed to be procured under a long term contract over a period of first 10 years... Subsequent extensions after 10 years will be decided, negotiated and contracted based on requirement of the Army as determined after performance of the supplier over the initial ten years of supplies.”

Further, “It is proposed that the manufacturer should develop the infrastructure and absorb the complete [Transfer of Technology] for manufacture of ammunition within two years from signing of contract.” For this, there will be no government funding.

The RFI covers almost most type of ammunition, except for small arms, from 23-millimetre rounds for air defence guns to 155-millimetre artillery gun ammunition. India’s military faces a serious shortage of ammunition, with stocks catering for just 20 days of intense battle, only half of the 40 days of battle stock that planners have mandated. The MoD has assessed that ammunition worth Rs 19,000 crore is needed to make up this deficit.

The RFI clearly weighs in favour of large private firms, with financial criteria that excludes many medium-scale private companies that have manufactured and supplied ammunition, and its components, for decades.

Companies eligible to participate must have a consolidated turnover of at least Rs 200 crore for each of the last three financial years; capital assets at gross book value of Rs 100 crore; revenue growth of at least five per cent in at least three of the preceding five financial years, and a minimum credit rating equivalent to CRISIL/ICRA “A”.

Small and medium sector company executives have already protested their exclusion from the contract, with at least one letter directly addressed to Defence Minister Manohar Parrikar.

Companies like Sandeep MetalCraft, Indo-Swiss Time, Micron Instruments, Premier Explosives and Polar, which have decades-long records of supplying high-technology components like electronic fuzes for artillery shells, find themselves left out of even smaller contracts, which could all flow to the selected large-scale vendors.

“Does the MoD realize that its policy deliberately excludes small and medium scale enterprises (SMEs), while the prime minister’s policy is to build up SMEs?” asks one chief executive officer (CEO), speaking off the record.

“I could understand the MoD’s reluctance to award a contract worth several thousand crore to a medium-scale industry. But we have been winning smaller contracts of up to Rs 150 crore, and supplying them reliably, even to international customers. Now, these guidelines will render us ineligible”, another says.

These apprehensions will be voiced at an “industry interaction” that the MoD has scheduled for December 9 in New Delhi. Vendors are required to respond to the RFI by December 16.

The RFI stipulates tough conditions to safeguard the supply of ammunition from subsequent technology denial, and to allow for the “surge manufacture” needed in wartime. It mandates that “the manufacturer will ensure continuous availability of minimum one year’s stock of ex-import components during first two years after signing of contract or 100% indigenisation, whichever is earlier. In case full indigenization is either not possible or not proposed, the manufacturer from third year onwards will have to hold two year’s stock of ex-import content at all times.”

Private firm CEOs point out that maintaining one/two years of ex-import stock would be a heavy financial liability, for which they assume the MoD would compensate them.

The proposal for nominating private sector strategic partners was mooted by the MoD-constituted Dharendra Singh Committee in 2014-15. Subsequently, the VK Aatre Task Force recommended designating one private sector strategic partner (SP) for each of seven technology areas — aircraft; helicopters; aero engines; submarines; warships; guns and artillery, and armoured vehicles. It also recommended that three other technology areas — metallic material and alloys; non-metallic materials; and ammunition, including smart munitions — have two strategic partners each designated.

Concerns and challenges

By Commander (rtd) Chaitanya Chandel and Bidanda Chengappa

After the 26/11 strike, though Navy is designated as nodal coastal security agency, it is not operationally oriented to take up this task.

Today, coastal security remains as vulnerable to sea-borne threats as when Ajmal Kasab and his cohorts landed ashore and threatened Mumbai eight years ago on November 26, 2008.

While the Indian Navy (IN), the Indian Coast Guard (ICG) and the state police forces handle operations at sea, a multiplicity of agencies like the Department of Fisheries, mercantile marine departments of the coastal states, Director General Lighthouses, Ministry of Shipping and the Department of Ports among a host of others are stakeholders. Therefore, coastal security is a shared responsibility not limited solely to the IN, ICG and state police.

Coastal security straddles both the military and police roles and therefore needs a force that can operate both like the navy as well as the police. Globally, the coast guard is the force of choice that carries out this role being inferior to the navy in war-fighting capabilities but superior to the police in training and firepower, besides airborne and marine platforms.

However, today, both the ICG and IN lack the legal powers to arrest and hold boats and personnel at sea. Operationally, the powers to file a First Information Report (FIR) from the sea, as well as to seize and detain personnel and boats are essential to fulfil the police function of this role. There is also a need to streamline the process to hand over the FIR, personnel, boats and contraband/ material from the IN or CG to the police for further action under the Indian Criminal Procedure Code.

After the 26/11 sea-borne terrorist strike, though the IN is designated as the nodal coastal security agency, it is not operationally oriented to take up this task. The IN is primarily oriented and equipped for a war-fighting role. Its professional expertise is to sail the high seas beyond 200 nautical miles and engage hostile vessels either during war or peace. On the other hand, coastal security also requires intensive patrolling from the coastline to 12 nautical miles where the waters are dense with smaller craft which sail in this marine space.

It is estimated that around 2.5 lakh small boats and vessels ply these waters for fishing and transport. The state police forces are supposed to patrol these coastal waters to pre-empt illegal activities as well as the movement of terrorists.

Unfortunately, the state police is a land-oriented force and unable to cope with the marine environment. The police are dependent on the IN and ICG who have adequate exposure at sea and the capability to cope with eventualities there. The ICG has a charter to concentrate on the sea between 12 to 200 nautical miles and therefore cannot constantly check the large volume of smaller boats that ply between the coastline and 12 nautical miles that have the potential to transport terrorists or contraband.

To manage coastal security operations across peninsular India, it is necessary to establish state-level operations rooms with cross-functional teams from all agencies involved which will prove a force multiplier for the ICG. There is also a need to supplement the existing infrastructure for logistics, technical support and training as well as optimise the use of existing boats and assets. Experience with the IN and ICG can be used to improve procurement of equipment with an indigenous focus which can be supported in the country. This will help alleviate problems with equipment maintenance and spares those coastal police forces face.

It seems logical that boat movement into and out of Indian waters needs to be regulated to ensure coastal security. However, no progress has been made towards tracking fishing boats. This remains a contentious issue and a political hot potato since large fishing fleet owners contribute to party election funds.

In itself, this single lacuna nullifies progress made on every other front. It needs to be understood that every fishing boat that is tracked becomes part of the coastal security system. Every boat logged into the system amounts to a pair of eyes and ears at sea. Conversely, every boat not in the system remains a potential threat.

Information sharing

The problems of information sharing and maritime domain awareness can be solved with technologies like Geographic Information Systems and knowledge management systems which would help share operations plots and specialised knowledge currently with each agency.

They would also provide common platforms to bring together operational and support agencies, besides creating synergy, to enable free flow of information and enhance transparency. Today, much more needs to be done in the areas of 'information and plot sharing' among various agencies which continue to remain isolated from each other. The technology and capability to do so is available within the country and must be used as far as possible to avoid reliance on foreign vendors. New breakthroughs in technology make fishing boat tracking and communications at the national scale an exciting field. While costs remain a concern, making this field a focus area for startups through provision of tax breaks should help to produce breakthroughs.

Over the last eight years, there has been considerable progress on coastal security over intelligence sharing and inter-agency communication at the national level. Today, coastal security remains New Delhi-centric where the cabinet secretary annually chairs a few meetings of the National Committee on Strengthening Maritime and Coastal Security.

However, the nine coastal state governments and four Union Territories relate to coastal security with varying degrees of seriousness. This is evident from the reports of the audits of Comptroller and Auditor General that highlight unspent budgets. Moreover, the state of boats, equipment and police organisational structure does not inspire confidence that security cannot be breached along the country's 7,516-km coastline.

(Chandel is involved with technology development for coastal security and Chengappa is a Professor of International Relations and Strategic Studies, Christ University, Bengaluru)

MAIL TODAY

Sat, 26 Nov, 2016

Note ban: Army seeks relaxation for jawans

'Soldiers deployed in remote areas can't go to banks before Dec 31 date'

The Army is planning to request the government to allow its soldiers deployed in remote areas to deposit and exchange `500 and `1,000 currency notes at banks beyond the December 31 deadline as part of the demonetisation drive of Prime Minister Narendra Modi. A large number of soldiers from the Army are deployed in remote areas such as Siachen and Line of Control and have cash amount of around Rs. 30,000-40,000 kept with their families at village homes for either marriage of kin or construction of house there.

"Many of them don't have a family member who can go to the bank and get the money exchanged or deposited at the banks. So, we are planning to request the government if they can be given some relaxation in the deadline for depositing or exchanging old notes," a senior Army source told MAIL TODAY.

Under the present situation along the Line of Control and international border, the force cannot even send the soldiers on leave only for this purpose of note exchange, the sources said. The situation on the LoC has been heating up since the September 18 attack in Uri by terrorists in which 19 soldiers were killed in the wee hours when they were resting in the 12 Brigade camp area in tents near fuel dump. In some places, even leaves of soldiers were cancelled as they were required to be on the front. At many places, the vigil during both day and

night has been so strict that soldiers have not even got time to get the notes with them exchanged at banks due to their deployment in the remote locations.

“If we get a waiver, this will be a big relief for our troops as they can do their jobs without the worry of losing their hardearned money in the drive,” the source said. The Indian Army has a strength of around 1.3 million soldiers who are deployed across the most inhospitable and remote terrain. Majority of the soldiers belong to rural areas where people generally prefer transactions in cash for marriage and construction of houses. As per the guidelines issued by the Reserve Bank of India, the exchange of old 1,000 and 500 rupee banknotes will no longer be accepted from Friday, the government said, but the use of `500 notes for certain transactions has been extended till December 15. The Centre, which allowed a window of a fortnight to exchange these currency notes over the counter, has decided not to extend the facility given a decline in exchange transactions.



Sat, 26 Nov, 2016

Bangladesh to honour 1,668 martyrs of the Indian Army

‘Demonetisation will not affect purse for the soldiers who died during the 1971 Liberation War’

Bangladesh will honour 1,668 members of the Indian Army, who were martyred during the Bangladesh Liberation War. Their families will receive a Rs. 5 lakh purse as a mark of respect, said Liberation War Affairs Minister A.K.M. Mozammel Huq. The Prime Minister of Bangladesh, Sheikh Hasina, will be in Delhi between 18-20 December to hand over the money, in Indian currency, to the martyrs’ family members, the Minister told *The Hindu*.

‘Not a problem’

Demonetisation will “not be a problem” he added. “I have spoken to the Indian High Commissioner [in Dhaka]. I feel the problem of cash transactions in India will be addressed by the time our Prime Minister reaches Delhi.”

“We will convert Bangladeshi *taka* into dollars (about INR 100 crore for 1,668 martyrs) and give it to our High Commission in Delhi. They will convert it to Indian currency and the PM [Sheikh Hasina] will give it to the family members of the Indian martyrs. The issue will be addressed soon and depositing the amount [in a bank] will not be a problem,” Mr. Huq said. A letter of gratitude from Ms. Hasina in Bengali, English and Hindi, and a plaque, will also be given. A book on the contribution of the martyrs will be published, too.

“Besides, we will be raising a war memorial in the Brahmanbaria district [in Bangladesh] to pay homage to the Indian soldiers who laid down their lives for our war of liberation and independence,” said Mr. Huq, who himself took part in the armed resistance during the 1971 war and was a senior official of Bangladesh Chhatra League (formerly the East Pakistan Student League), the student’s political wing of the Awami League, at the time of the country’s independence. A retired Lieutenant-Colonel, Kaji Sajjad Ali Zahir, has worked closely with the Indian Army to identify the soldiers who were killed during the war. The gesture was mentioned in the joint declaration during PM Modi’s visit to Dhaka in 2015.



Sat, 26 Nov, 2016

India-Pakistan War Is Serious Business

By Hiranmay Karlekar

An India-Pakistan war is a terrible thing. New Delhi must do its best to avoid it, but what if efforts fail? We must be ready with a comprehensive geostrategic plan, encompassing diplomatic and military operations

As the skirmishes with Pakistani troops along the Line of Control in Kashmir and the International Border in Jammu gets more frequent and intense, the possibility of the situation escalating into a conventional war between India and Pakistan can hardly be ruled out. Of course, a war is a terrible thing and India should do everything it can to avoid one. But what happens if India's best efforts to do that fail? The answer is simple: It should be ready with a comprehensive geo-strategic plan, encompassing both diplomatic and military operations and worked out in detail, to win.

Diplomacy is as important as military action because the gains of the latter can be lost on diplomatic table. This happened to us in the Tashkent agreement of January 1966 after the 1965 war with Pakistan, when we gave back to the latter the Haji Pir Pass which we had won at great cost. It again happened in the Shimla agreement of July 1972, when we returned the over 90,000 Pakistani prisoners of war we held without extracting a Kashmir settlement from Islamabad.

One part of our diplomatic planning would be to have a clear idea of what we would hope to get at the end of the war and what is the minimum that we can accept, and how we should navigate our actions to secure the best we can between these two extremities. Having done this, we should have a clear idea of what we can expect from which country, identifying those that will support us to the hilt and to the last, those that will confine themselves to providing verbal and diplomatic support, those that will speak from all sides of their mouths, and those that can be expected to be outright hostile. The Ministry of External Affairs should have a good idea as to which country belongs to which category.

What it must now do is to formulate a course of action to mobilise each of them to perform a task which it can be reasonably expected to do. For example, India should ensure that, those that one knows would not provide anything more than verbal support, do at least provide that and outspokenly and at fora where they can be active.

The diplomatic aspect needs to be emphasised because Pakistan, which is militarily weaker, will step up its efforts to have a ceasefire clamped by the Security Council before things become too hot for it. Equally, it would want the Council to brand India as the aggressor irrespective of the facts of the case. Such attempts had failed during the 1965 and 1971 wars. In both these cases, India had the Soviet Union's solid support behind it. In the Kargil War of 1999, Pakistan was so blatantly the aggressor that even the United States asked it to withdraw.

Can we get Russia's support in the same measure in which we received in 1965 and 1971? The question should be addressed most seriously given India's increasingly close ties with the United States and Russia's more than mild flirtation with Pakistan. This in turn gives a sharp edge to the question: How much support can we expect from the US in a war with Pakistan? Despite recent bursts of euphoria over the extremely cordial ties between the world's richest and largest democracies, past record is by no means reassuring. The US has continued to pour huge amounts into Pakistan as aid despite the latter's growing support to the Afghan Taliban and organisations like Lashkar-e-Tayyeba which are attacking the Government in Kabul that Washington supports, and killing US servicemen in Afghanistan. There is unlikely to be any change in this situation.

Clearly, India needs to work pretty hard on its foreign policy vis-à-vis Pakistan while preparing at the military level to foil its aggressive thrust. No war should be taken lightly, and certainly not one with Pakistan which has a good, professional Army and, over the last 15 years, built up a huge and sophisticated arsenal, with weapons mainly for us against India, with vast funds received from the US. Unfortunately, India's defence purchases were negligible during the 10 years of the United Progressive Alliance's Government from 2004 to 2014. As a result, the National Democratic Alliance that came into power in the latter year, found itself forced to go on a crash course of defence acquisition. While it has made some progress, much remains to be done particularly since the delivery of items for which a number of agreements been signed will take several years.

The point is that we must be prepared in every respect to win in case a war becomes unavoidable. One reason why we could wrap up the Bangladesh campaign in 1971 is that we waited till the conditions were right. A war during the monsoon when Bangladesh's formidable rivers were in full spate and all tributaries and canals brimming, would have been very slow and international pressure may have forced us to a halt before we had occupied Dhaka. Equally, we had to ensure that we had the right kind of military hardware and in full measure.

Thus, while we had to conserve as much ammunition as we could during the 1965 war, we were under no such constraint in 1971.

Being ready means not only having the military hardware and the strategic and tactical planning in place, but being prepared for operations behind the enemy's lines, utilising to the full Pakistan's political and societal faultlines. This in turn underlines the importance of our providing material, and not just moral, support to Balochistan's struggle for justice and the struggle by Shias in Pakistan to live with dignity and security. There can be no under-estimation of the need for this. Pakistan will certainly utilise the widespread network its Directorate-General of Inter-Services Intelligence has built up in India.

That this is not pointless fear-mongering becomes clear on recalling the blast in the New Jalpaiguri railway station on June 22, 1999, which killed nine persons, including three Kargil-bound jawans, and injured 80. The act, which the then chief minister of West Bengal, Buddhadev Bhattacharjee unambiguously attributed to the ISI, was a part of Pakistan's efforts to interdict the movement of goods and supplies from north-eastern India to Kargil. Any plan to cope with a war with Pakistan must include both a plan to ensure internal security and pay it back in its coin by lighting fires in its backyards. The sooner we are prepared to do this, the better.

(The writer is Consultant Editor, The Pioneer, and an author)



Sat, 26 Nov, 2016

China to deploy navy ships at Gwadar port: Pak official

Move Could Alarm India and US

China would deploy its naval ships along with Pakistan navy to safeguard the strategic Gwadar port and trade routes under the \$46 billion China-Pakistan Economic Corridor (CPEC), a Pakistani navy official here has said, shedding light on a plan likely to alarm India.

China and Pakistan are currently building the nearly 3,000-km-long economic corridor linking Pakistan's Gwadar port on the Arabian Sea with Xinjiang to improve connectivity between the two countries. The move would open up a new and cheaper cargo route for transporting oil to China as well as export of Chinese goods to the Middle East and Africa.

A Pakistan navy official said the role of maritime forces has increased since the country has made the Gwadar port operational and speeded up economic activities under the CPEC.

“China would also deploy its naval ships in coordination with Pakistan navy to safeguard the port and trade under the CPEC,” the unnamed official was quoted as saying by The Express Tribune.

In the past, China has shied away from saying that it plans to deploy its naval ships in Gwadar, a move which could raise alarm in the US and India. Experts feel that CPEC and the Gwadar port would enhance the military capabilities of both China and Pakistan, and make it possible for the Chinese navy to easily access the Arabian Sea.

Having a naval base in Gwadar could allow Chinese vessels to use the port for repair and maintenance of their fleet in the Indian Ocean region. Such a foothold would be the first overseas location offering support to the Chinese navy for future missions.

Pakistani defence officials are keen for the Chinese navy to build up its presence in the Indian Ocean and the Arabia sea, mainly to counterbalance India's formidable naval force. The Pakistani official also said that the navy is considering buying super-fast ships from China and Turkey for its special squadron to be deployed at the Gwadar port for the security purpose. “A squadron may have four to six warships,” he said on the sidelines of the on-going defence exhibition, IDEAS 2016, at the Karachi Expo Centre.

The ships would be bought soon keeping in view their immediate need in the fleet, he said, adding that two defence ships have already been deployed at Gwadar.

Another official of the naval force added that Pakistan has kicked off the process of establishing the largest shipyard of the region in Gwadar. A similar shipbuilding project is being deliberated at Port Qasim in Karachi. The two advanced shipyards would design and develop ships and other security equipment for Pakistan navy . “The existing shipyard, the Pakistan National Shipping Corporation, lacks capacity to meet new requirements of the force. Its (PNSC) performance, however, would improve in competition with the two under consideration,” he said.

THE ASIAN AGE

Sat, 26 Nov, 2016

NASA developing breakfast food bars for deep space mission

Astronauts need a robust diet to keep themselves healthy and sharp during their space travel

Scientists at NASA are developing a variety of food bars that astronauts onboard the Orion spacecraft can eat for breakfast during their travel beyond the Moon to explore deep space destinations.

When astronauts explore deep space destinations, they will need a robust diet to keep them healthy and sharp. While crew members aboard the International Space Station (ISS) can choose from about 200 items for their meals and have the space to stow an array of options, feeding the crew on deep space missions presents several unique challenges that NASA scientists are working to tackle.

Orion has limited room inside it to accommodate the supplies and food astronauts will need during their missions. Since flights to deep space will not rely on resupply spacecraft to deliver what astronauts need and dispose of trash, the Orion crew will have to take everything they need with them and bring it all back home.

Given the distances Orion will travel, teams also must limit Orion's mass, since a heavier spacecraft requires more fuel and energy to propel it to its ultimate destination.

To help reduce the amount of supplies Orion will carry for its crew, scientists are developing a variety of food bars that astronauts can eat for breakfast during their spaceflight missions. Food scientists determined that developing a single calorically dense breakfast substitution can help meet mass reduction requirements.

“We’ve taken a look at how to get some mass savings by reducing how we're packaging and stowing what the crew would eat for breakfast for early Orion flights,” said Jessica Vos, deputy health and medical technical authority for Orion.

“When you think about multi-week missions in Orion, having just one package for breakfast items for crew will help us limit the space we need to store them,” Vos said.

On Orion, the goal is to have a number of food bars to select from in a variety of flavours like orange cranberry or barbeque nut for their first meal of the day, reducing the amount of space and storage the breakfasts require.

For lunch and dinner, Orion astronauts will be able to select from similar items space station crew members eat and have a food warmer to help them prepare their meals. However, designing a food bar to a specific nutritional balance for astronauts while also increasing caloric density and passing the taste test is no small task.

“There’s no commercially-available bar right now that meets our needs, so we've had to go design something that will work for the crew, while trying to achieve a multi-year shelf-life,” said Takiyah Sirmons, a food scientist with the Advanced Food Technology team at NASA’s Johnson Space Centre.

The food bars, which are being developed in coordination with NASA's Human Research programme have been tested by crew members inside HERA, the agency's three-story habitat designed to serve as an analogue for the isolation and remote conditions in exploration scenarios.

Sat, 26 Nov, 2016

IIT-Madras to help CERN unravel mysteries of universe

CHENNAI: In 2025, when scientists at CERN, the European Organisation for Nuclear Research, start looking for signs of a new charged particle from the massive 14,000tonne CMS (Compact Muon Solenoid) detector installed in France, a silicon tracker detector built by Indian Institute of Technology Madras (IIT-M) will be among the key tools. Data from the main detector 100m below ground may help scientists understand the evolution of the universe better.

The silicon detector made by IIT-M will replace the existing detector when it dies out by 2025. IIT-M professor Prafulla Kumar Behera, who is the co-convenor, B-physics subgroup in CMS, said the institute would build part of the silicon detector in col laboration with other Indian institutes. The silicon detector will be one of the four subdetectors in the main CMS detector. "IIT-M will fabricate highprecision mechanics made of aluminum carbon fibre and carbon fibre. They are lightweight material that support structure for the sensors in the detector," he said.

This is not the first time a detector for CERN is being built in India. A part of a detector for the Large Hadron Collider, which helped scientists discover Higgs Boson in 2012, was built in India.

A CMS detector is designed to see a wide range of particles produced during high-energy collision of protons. When this happens, scientists will essentially be recreating a very small model of the state of the universe when it was in the first tril lionth of a second after the Big Bang. The silicon detector, which will be installed near the collision point, will give the position of the particle when it travelled through the detector. The magnetic field in the CMS detector will help find the momentum of the particle. For physicists, this data is the key as it will help draw a picture of events at the heart of the collision.

IIT-M became the first IIT to be made a full member of the experiment at CERN in 2014 involved in validation of the high level trigger and silicon tracker calibration. The team comprises four faculty members and nine students. arlier this week, India became an associate E member of the organisation after being inducted as an observer in 2004. IIT-Madras is also likely to be one of the silicon sensor qualification centres. Two scientists from CERN recently visited the campus along with faculty from collaborating institutes. Behera said that India will also manufacture 2000 of the total 10,000 sensors in the silicon detector.

A production centre will be set up for the purpose. It will be one of the five centres that will manufacture the sensors, the others will be in countries including Germany and the US. India is the seventh largest country in the CMS collaboration which comprises 3,200 scientists and engineers and 800 students from 190 institutions across 42 countries. Apart from IIT-M, Indian collaborators include TIFR, BARC, Delhi University , Punjab University , NISER, IISER in Pune, IISC and SINP.



Sat, 26 Nov, 2016

IIT team tracks brown carbon's effect on atmospheric warming

High levels of the aerosol found in Kanpur due to biomass burning

The effect of biomass burning in increasing atmospheric aerosols and in turn atmospheric warming through light absorption has been highlighted in a study by a team of researchers from the Indian Institute of Technology (IIT) Kanpur. While the role of black carbon produced by biomass burning in increasing atmospheric warming has already been well established, this study highlights the lesser-known role of brown carbon. Compared with earlier studies carried out in the U.S, absorption of light of 365 nanometre wavelength was found to be five times higher in Kanpur, which has a high biomass burning area. Also, brown carbon

accounts for about 30 per cent of light absorption in Kanpur. The results were published on November 24 in the journal *Scientific Reports*.

“What is seen in Kanpur can be generalised for the entire Indo-Gangetic Plain because the sources of aerosol remain the same throughout the region,” says P.M. Shamjad from the Department of Civil Engineering, IIT Kanpur, and the first author of the paper. “Based on 50 days of measurement in the winter of 2014-2015 we were able to clearly apportion the amount of light absorption by different carbonaceous aerosols. Though brown carbon is 10 times more than black carbon in terms of mass, the absorption capacity of black carbon is 50 times more than brown carbon,” says Prof. S.N. Tripathi from the Department of Civil Engineering, IIT Kanpur, and the corresponding author of the paper. As a result, up to about 70 per cent of light absorption during 24 hours is by black carbon. Brown carbon (when present independently) has nearly 15 per cent potential to warm the atmosphere by absorbing light.

In mixed forms

Additionally, depending on the spectrum of light, the light absorption capacity of brown carbon is 15-30 per cent when present as a coating (shell) over a black carbon core. “This is because the brown carbon coating behaves like a lens and focuses light towards the black carbon core,” says Mr. Shamjad.

The lensing (concentration of light on the core) is dependent on three parameters — ratio of the diameter of the shell to the diameter of the core, wavelength of light and the scattering or absorbing property of the coating. “When you have an absorbing coating less light reaches the core. But when the coating is non-absorbent, light gets scattered and more light reaches the core. This leads to more overall light absorption and, in turn, more atmospheric warming,” says Prof. Tripathi.

Unlike at 405 nm (near UV), at 781 nm (near infrared), the lensing becomes predominant as the absorption capacity of the brown carbon coating is non-existent. This is because during daytime, photo bleaching of the brown carbon by sunlight creates a new compound that is no longer able to absorb sunlight.

“The contribution of lensing to light absorption goes up to nearly 35 per cent. This has very serious implications on atmospheric warming,” Prof. Tripathi says.



Sat, 26 Nov, 2016

Japan plans supercomputer to leap into technology future

Tokyo, Reuters: Japan plans to build the world's fastest-known supercomputer in a bid to arm the country's manufacturers with a platform for research that could help them develop and improve driverless cars, robotics and medical diagnostics.

The Ministry of Economy, Trade and Industry will spend 19.5 billion yen (\$173 million) on the previously unreported project, a budget breakdown shows, as part of a government policy to get back Japan's mojo in the world of technology. The country has lost its edge in many electronic fields amid intensifying competition from South Korea and China.

In a move that is expected to vault Japan to the top of the supercomputing heap, its engineers will be tasked with building a machine that can make 130 quadrillion calculations per second - or 130 petaflops in scientific parlance - as early as next year, sources involved in the project said. At that speed, Japan's computer would be ahead of China's Sunway Taihulight that is capable of 93 petaflops.

"As far as we know, there is nothing out there that is as fast," said Satoshi Sekiguchi, a director general at Japan's National Institute of Advanced Industrial Science and Technology, where the computer will be built.

The push to return to the vanguard comes at a time of growing nostalgia for the heyday of Japan's technological prowess, which has dwindled since China overtook it as the world's second-biggest economy.

Prime Minister Shinzo Abe has called for companies, bureaucrats and the political class to work more closely together so Japan can win in robotics, batteries, renewable energy and other new and growing markets. In the area of supercomputing, Japan's aim is to use ultra-fast calculations to accelerate advances in artificial intelligence, such as "deep learning" technology that works off algorithms which mimic the human brain's neural pathways, to help computers perform new tasks and analyse data. Recent achievements in this area have come from Google's DeepMind AI program, AlphaGo.



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New technique to make fuel cells more energy efficient

Boston: In a finding that could lead to better fuel cells and clean energy technologies, scientists have discovered that squeezing a platinum catalyst a fraction of a nanometre nearly doubles its activity.

A nanosize squeeze can significantly boost the performance of platinum catalysts that help generate energy in fuel cells, according to scientists at Stanford University in the US.

The team bonded a platinum catalyst to a thin material that expands and contracts as electrons move in and out, and found that squeezing the platinum a fraction of a nanometre nearly doubled its catalytic activity.

"In this study, we present a new way to fine-tune metal catalysts at the atomic scale," said Haotian Wang, a former graduate student at Stanford now at Harvard University.

"We found that ordinary battery materials can be used to control the activity of platinum and possibly for many other metal catalysts," said Wang.

The new technique can be applied to a wide range of clean technologies, Wang said, including fuel cells that use platinum catalysts to generate energy, and platinum electrolyzers that split water into oxygen and hydrogen fuel.

"Our tuning technique could make fuel cells more energy efficient and increase their power output," said Yi Cui, a professor of materials science and engineering at Stanford.

"It could also improve the hydrogen-generation efficiency of water splitters and enhance the production of other fuels and chemicals," said Cui.

Catalysts are used to make chemical reactions go faster while consuming less energy. The performance of a metal catalyst depends on its electronic structure - that is, how the electrons orbiting individual atoms are arranged.