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Covid-19: New sample testing rule may delay local PPE production

The four laboratories that test the kits already have a large backlog of samples to be tested, and getting the affidavit physically from some of the manufacturers to the labs could take several days with the country in lockdown, according to Preventive Wear Manufacturers Association of India chair Sanjiiv Rehlan.

By Teena Thacker

New Delhi: Indian manufacturers of personal protective equipment (PPE) have flagged a new government rule, which makes a notarised affidavit from them compulsory for testing of PPE samples, as a hurdle in quickly ramping up production of the kits used by health workers that are in short supply.

The four laboratories that test the kits already have a large backlog of samples to be tested, and getting the affidavit physically from some of the manufacturers to the labs could take several days with the country in lockdown, according to Preventive Wear Manufacturers Association of India chair Sanjiiv Rehlan. The delay in getting approvals could lead to substandard PPE kits getting into the market with fake certifications, he said.

As per the textile ministry's order, government-approved laboratories would accept the samples only on submission of a notarised affidavit from the manufacturer, taking responsibility of quality, agreeing to face legal action, including criminal prosecution, if the products are found to be not meeting the minimum technical requirement and certifying that they are not traders and have all approvals. The unique certification code issued by the labs should form the basis for placement of orders by HLL Lifecare, which is the nodal agency for acquiring PPEs, according to the order dated April 22.

Domestic manufacturers who are not too happy with the speed at which the samples are getting tested say the new order would add to the delay.

Domestic manufacturers who are not too happy with the speed at which the samples are getting tested said the new order would add to the delay.

"Even after having four functional labs in India to check the garment as per the Ministry of Health and Family Welfare guidelines, we are not finding any solutions to clear the shortages ... The sample submitted on 18th April is yet to get clear, such is the situation," Preventive Wear Manufacturers of India chairman Sanjiiv Rehlan said.

The labs of Defence Research and Development Organisation in Delhi, South India Textile Research Association in Coimbatore and Ordnance Factory Board in Muradnagar and Kanpur are the approved labs for the testing. The kits are distributed to various agencies only after they pass stringent quality tests. A PPE kit contains a full-body suit, masks, goggles, gloves, and shoe covers.

The DRDO laboratory in Delhi has 900 samples pending for testing.

DRDO Life Sciences director General AK Singh said efforts were ongoing to speed up testing.

"Every sample takes two hours to be tested. Earlier we had only one machine; now we have two more machines which we have got fabricated locally and we are hoping that the speed of samples getting tested will increase," he said.

Rehlan said the delay in getting the samples tested would trigger the sale of substandard kits. He said some of the association's members had submitted the affidavits, but the reports of the tests

were still awaited. “Samples of manufacturers from Mumbai and Raipur are still pending because their affidavits will take another 4-5 days to reach Delhi,” he said.

India wants 1 million coveralls and goggles, 4 million N-95 masks, 2 million nitrile gloves, 600,000 face shields and 2 million triple-layer surgical masks among other items, according to a March 24 tender document. It has imported PPE kits from China, Singapore and South Korea in order to meet its requirements.

<https://economictimes.indiatimes.com/news/politics-and-nation/covid-19-new-sample-testing-rule-may-delay-local-ppe-production/articleshow/75462513.cms>



Thu, 30 April 2020

New Covid-19 sample collection lab

Rajnath Singh, Defence Minister of India, dedicated the first COVID-19 sample collection mobile lab of the country — Mobile BSL-3 VRDL Lab.

This lab has been developed by Defence Research and Development Organisation (DRDO), Ministry of Defence, Government of India, in collaboration with ESIC Medical College and Hospital, Sanathnagar (Hyderabad) with due permission of Indian Council of Medical Research (ICMR) and Government of Telangana.

Speaking on the occasion, Rajnath Singh appreciated the efforts of DRDO and ESIC in setting up of this Bio-Safety Level 2 and Level 3 lab in a record time of 15 days, which usually takes about six months time. He further said, “This testing facility can process more than 1,000 samples in a day and will enhance country’s capabilities in fighting COVID-19.”

Santosh Kumar Gangwar, Labour Minister, Government of India, also complemented DRDO and ESIC for developing the mobile testing lab in a very short time. He said, “It’s a very important step in our fight against Coronavirus.”

<https://www.dailypioneer.com/2020/vivacity/new-covid-19-sample-collection-lab.html>





Thu, 30 April 2020

India's Next-Gen AMCA Fighter Jet should have local engines – IAF to DRDO

The air force is likely to insist on a clause for development of an indigenous aero engine when it clears a multi-billion dollar programme to go ahead with the next generation Advanced Multirole Combat Aircraft (AMCA) by the Defence Research and Development Organisation (DRDO).

The fighters – expected to take to the skies by 2026 as per current projects – are being planned to substitute costly imports of combat aircraft in the future, with the air force keen that a home grown engine be developed for true self dependence.

Sources said that while the first two squadrons of the AMCA will be powered by a variant of American origin GE 414 engine, the project will be clearing in the coming months on the condition that a parallel process be initiated by DRDO to develop a aero engine plant with foreign collaboration. “A clear path towards developing our own aero engine is essential and should be done along the AMCA programme which is being supported. If needed, foreign collaboration from western nations that have advanced technologies can be sought,” senior officials told ET.



The assessment within the Indian establishment is that engine technologies needed for future aircraft are available with nations like France, UK and the US while traditional ally Russia has lagged behind in the field. The Indian side is also keen not to repeat a deficiency in the Chinese weapons development programme where the lack of a reliable aero engine programme is seen as an impediment.

As reported by ET, the DRDO has carried out preliminary designs for the AMCA and is confident that it will be in a position to roll out the first test fighter within five years of the project receiving the next stage of financial sanction that is pegged around \$ 1 billion. The air force has put its weight behind the project as well, along with the Light Combat Aircraft. In comments preceding the air force day, Air Chief Marshal RKS Bhadauria had said that “on the fifth generation (requirement), the AMCA has been given a go ahead and we have given it our whole support and are putting in our energies there” and that no imports were planned in the foreseeable future.

Plans to develop the indigenous Kaveri fighter jet engine as part of the Rafale offsets deal have not taken off, even though presentations have been made by the French side on creating an aircraft engine ecosystem in India. Similarly, a plan to share jet engine technology under the US-India Defense Technology and Trade Initiative (DTTI) has been suspended last year after little progress was made by the two sides after detailed discussions.

<https://www.defenceaviationpost.com/2020/04/indias-next-gen-amca-fighter-jet-should-have-local-engines-iaf-to-drdo/>



Thu, 30 April 2020

Soldiers of MRC Wellington defeats Covid, saves many lives in Nilgiri

By Kumar Chellappan

Kochi: Whether it is war or peace, Madras Regiment Centre, Wellington, in Nilgiris of Tamil Nadu, does not need any introduction to people in South India. During wars, the brave soldiers of MRC Wellington had performed unbelievable missions to eliminate and annihilate the enemies.

The actions of the brave jawans of the unit are folklores in this part of the country. During peace time, MRC Wellington was the most sought after team in South India's football circuit. The All-India Football Tournaments in Kannur, Kozhikode and Thrissur in Kerala used to have sold out galleries when Kuppusamy and late Vinod Philip kicked the ball around much to the glee of their fans.

Wars are over and football is almost dead in this part of the country except for the Indian Soccer League matches. But the tradition of MRC Wellington lives on. The warriors of this glamorous unit of the Indian Army are fighting a different war in 2020 April. True to the theme of Indian Army, "Har Kaam Desh Ke Naam", the brave fighters along with the Army Wives Welfare Association are on a mission to provide food, medicine and other essential items to residents of interior Nilgiris which are inaccessible to ordinary folks because of the hilly terrains.

When the civil administration intimated the difficulties faced by the government staff in reaching out to labourers and their families in the hinterland of the Blue Mountains, officials of MRC did not think twice. The MRC jawans were on the mission to transport dry ration including atta, rice, daal and oil. They worked on the motto decided by Indian Army: "Combating COVID with Care and Compassion".

"The Indian Army has been in forefront of reaching out to needy and providing them with the much-needed relief materials as a result of which a large number of people have benefited. In consonance with Indian Army's slogan "Har Kaam Desh Ke Naam" to combat COVID 19, the units and Centres of Dakshin Bharat Area will remain committed to reaching out to the needy people thereby upholding the ethos of "Service Before Self", said a media release issued by the Commandant of the MRC on Wednesday.

The Jawans who undertook the mission prefer to be the unsung heroes.

They are happy seeing the smiling faces of the children, aged and inform who could get sumptuous meals because of their adventurous mission defeating coronavirus, rains and inhospitable terrain of the Wild Western Ghats.

<https://www.dailypioneer.com/2020/india/soldiers-of-mrc-wellington-defeats-covid--saves-many-lives-in-nilgiri.html>

Intel agencies warn army personnel of fake 'Aarogya Setu' app from Pakistan

An advisory from security agencies warned that a fake application from Pakistan, emulating Aarogya Setu, may be used to steal sensitive data from users

New Delhi: Security agencies have warned Indian Army troops and paramilitary forces that a counterfeit app from Pakistan emulating India's anti-Covid-19 'Aarogya Setu' application has been put up to steal sensitive data.

An advisory from security agencies warned that the fake mobile application can be sent to a user via WhatsApp or through SMS, a phishing email or other links or through social media platforms.

The advisory urged the security personnel to download the 'Aarogya Setu' application only through legitimate and authorised links from the 'mygov.in' website.

"The fake app during installation asks the user to permit the use of the internet and the installation of additional application packages. "Thereafter, it installs malicious links like face.apk, imo.apk, normal.apk, trueC.apk, snap.apk and viber.apk," the advisory, accessed by PTI, said.

These viruses then snoop on users' phone and allow a hacker to track and monitor the content and activity of the user through the phone. The data retrieved from the phone is then sent and saved at the command and control server which is reportedly in the Netherlands, a senior official told PTI.

The security personnel have been advised to exercise extreme caution while clicking on suspicious links on social media sites, email over their phones. They are also urged to keep anti-virus apps updated on their phones.

The Aarogya Setu app is developed by the government in its bid to check the spread of Covid-19 and help people assess the risk of catching the highly contagious viral infection.

It also detects nearby phones having the Aarogya Setu through the app's bluetooth feature and captures information related to health history of users. The centre on Wednesday made it mandatory for government employees to download the app.

<https://www.timesnownews.com/india/article/intel-agencies-warn-army-personnel-of-fake-aarogya-setu-app-from-pakistan/584878>



Intel agencies warn army personnel of fake 'Aarogya Setu' app from Pakistan | Photo Credit: Thinkstock

फर्जी 'आरोग्य सेतु' एप से सेना को खतरा, जवानों को सतर्क रहने के निर्देश

नई दिल्ली: वैश्विक महामारी कोरोना वायरस से लड़ने के लिए भारत सरकार की ओर से लॉन्च किए गए आरोग्य सेतु एप के फर्जी संस्करण ने भारतीय सेना की चिंता बढ़ा दी है। सेना ने अपने जवानों को इस संबंध में आगाह किया है। सेना ने एक परामर्श जारी कर कहा है कि यह फर्जी एप संवेदनशील जानकारियां चुरा सकता है।

दरअसल, सुरक्षा एजेंसियों ने सैनिकों और अर्द्धसैनिक बलों को पड़ोसी मुल्क पाकिस्तान में बनाए गए आरोग्य सेतु एप से मिलते-जुलते एप्लीकेशन के प्रति सचेत किया है। सुरक्षा एजेंसियों ने कहा है कि दुर्भावनापूर्ण इरादे से आरोग्य सेतु एप से मिलता-जुलता मोबाइल एप्लीकेशन बनाया गया है। इसका मकसद संवेदनशील जानकारियां चुराना है। अधिकारियों ने बुधवार को एक परामर्श में कहा है कि यह फर्जी एप उपयोगकर्ता को व्हाट्सएप पर संदेश के जरिये या एसएमएस के जरिये, ईमेल के जरिये या इंटरनेट आधारित सोशल मीडिया के मार्फत किसी लिंक से प्राप्त हो सकता है। परामर्श में सभी कर्मियों को सुझाव दिया गया है कि आरोग्य सेतु एप को अपने फोन में डाउनलोड करने के लिए अधिकृत वेबसाइट माईजीओवी डॉट इन पर ही जाएं।

कैसे संध लगाता है फर्जी एप

परामर्श के मुताबिक, डाउनलोड किए जाने के दौरान फर्जी एप उपयोगकर्ता से इंटरनेट का इस्तेमाल करने और अतिरिक्त एप्लीकेशन पैकेज इंस्टॉल करने की इजाजत देने के लिए कहता है। इसके बाद, यह दुर्भावनापूर्ण लिंक फेस डॉट एपीके, आईएमओ डॉट एपीके, नॉर्मल डॉट एपीके, डूसी डॉट एपीके, स्नैप डॉट एपीके और वाइबर डॉट एपीके डालता (इंस्टॉल करता) है। एक वरिष्ठ अधिकारी के अनुसार इसके बाद ये वायरस हैकर को उपयोगकर्ता के स्मार्टफोन में मौजूद जानकारियों और फोन की गतिविधियों को जानने में सक्षम कर देते हैं। उपयोगकर्ता के फोन से निकाली गई जानकारियां एप की कमान एवं नियंत्रण केंद्र में रखी जाती हैं, जिसके नीदरलैंड में स्थित होने की बात कही जा रही है।

लिंक खोलते समय रहें सावधान

उन्होंने कहा कि सभी सैनिकों को अपने मोबाइल फोन पर सोशल मीडिया और ईमेल पर संदिग्ध लिंक खोलते समय सावधान रहने के लिए कहा गया है। साथ ही उनसे एंटी वायरस अपडेट करने के लिए भी कहा गया है। बता दें कि भारत सरकार ने आरोग्य सेतु एप लोगों को कोरोना वायरस संक्रमण के प्रति जोखिम का आकलन करने में मदद करने के लिए लॉन्च किया है। केंद्र सरकार ने बुधवार को सरकारी अधिकारियों के लिए इसे डाउनलोड करना और अपने फोन में इस एप का उपयोग करना अनिवार्य कर दिया।

<https://www.amarujala.com/india-news/coronavirus-case-news-in-hindi-indian-army-warns-soldiers-paramilitary-forces-against-fake-arogya-setu-app>

Warships on standby to evacuate Indians

The officials said that the MEA is also in touch with the Indian Air Force (IAF), which has conveyed how it can contribute and what assets can be deployed to bring back the stranded people

New Delhi: India has kept three warships on standby to bring back thousands of Indians stuck in West Asian countries as New Delhi works towards implementing an evacuation plan that will also include special flights amid the coronavirus outbreak, officials said Wednesday.

These warships are INS Jalashwa and two other amphibious warships, the officials said. “The ministry of external affairs (MEA) is steering the plan. The navy is prepare,” one official said.

As reported by HT on Tuesday, Prime Minister Narendra Modi spelt out the ground rule for the evacuation — India’s blue collar workers stranded abroad will get the first seats in the special flights that

will be run by the government to get them home. Students will be next, followed by everyone else, including those who were travelling for work, or pleasure.

The officials said that the MEA is also in touch with the Indian Air Force (IAF), which has conveyed how it can contribute and what assets can be deployed to bring back the stranded people. The officials said the IAF’s C-17, IL-76 and C-130J aircraft could be pressed into action but it would make more sense for Air India to send its aircraft as they are “better configured to carry passengers and cargo”. “Nothing has been finalised yet,” a second official said.

MEA officials refused to comment on the matter.

The three warships can accommodate around 1,500 people in all. The Jalashwa can bring back around 800 and the warships can together accommodate 700, the officials quoted above said.

“The warships can carry more people but social distancing norms will have to be followed during the proposed evacuation,” one said.

A navy spokesperson refused to comment on the development.

Air Vice Marshal Manmohan Bahadur (retd), additional director general, Centre for Air Power Studies, said, “The military has time and again shown that it has the capabilities to come to the aid of stranded diaspora. We saw that in Yemen recently and in Libya and Kuwait evacuations earlier. With the available capability, we can actually declare ourselves to be a regional HADR (humanitarian assistance and disaster relief) provider.”

The armed forces have played an important role in the fight against Covid-19, setting up quarantine centres, providing healthcare facilities and evacuating Indian nationals from other countries.

<https://www.hindustantimes.com/india-news/warships-on-standby-to-evacuate-indians/story-oR8IJSvJy0AM3INDpXEP8I.html>



The officials said that the MEA is also in touch with the Indian Air Force (IAF), which has conveyed how it can contribute and what assets can be deployed to bring back the stranded people. ((Photo for representative purpose only) (PTI))

India green-lights UAE, Kuwait request for ex-military doctors, nurses

India will also send two military rapid response teams comprising army doctors, nurses and paramedics to Mauritius and Comoros to help them cope with the crisis

By Shishir Gupta

Medical Assistance to Gulf countries

- UAE - 428 lakh HCQ tablets, 10 tonnes of HCQ active pharmaceutical ingredient (API), 220 million paracetamol tablets
- Kuwait - 7.7 million paracetamol tablets, injections etc
- Bahrain - 15 lakh HCQ tablets
- Jordan - 0.5 tonnes of HCQ API
- Oman - 10 lakh HCQ tablets
- Qatar - 80,000 HCQ tablets
- Saudi Arabia - 0.52 tonnes of HCQ API

New Delhi: The government has given an in-principle approval to requests from Kuwait and the United Arab Emirates to send Indian doctors and paramedics to help the two Gulf countries fight the Covid-19 pandemic, a top government official told Hindustan Times on Wednesday.

Kuwait was the first one to seek Indian medical assistance earlier this month when Prime Minister Sheikh Sabah Al-Khaled Al-Hamad Al-Sabah called Prime Minister Narendra Modi. The Indian Air Force had then flown a 15-member military rapid response team.

As this team was wrapping up - it returned on Monday - New Delhi received the request for more medical teams. "They were very impressed with the rapid response team," an official said.

By this time, senior government officials said, another request for Indian healthcare personnel had come in from the United Arab Emirates. There are also similar requests pending from Mauritius and Comoros, the archipelago off Africa's east coast Comoros, that are battling the disease.

Other Gulf countries have also sounded out New Delhi that they would need Indian medical assistance and are expected to send formal requests shortly.

In response to these requests, the top official said, "an in-principle decision has been taken to allow retired military doctors, nurses and technicians to travel to UAE and Kuwait to begin with".

For Comoros and Mauritius, the government has okayed short-term deployment of the military's rapid response teams. These self-contained teams comprise military doctors, nurses and other paramedics.

The foreign ministry and the armed forces are still working out the mechanics of how the medical teams for Kuwait and UAE would be constituted.

"Retired military healthcare professionals - doctors, nurses, lab technicians - who are ready to take up this assignment, can opt to help the Gulf countries," the official said.

On an average, a top military official told Hindustan Times, about 100 doctors, 30-40 nurses and a few hundred paramedics retire from the Army Medical Corps every year.



Prime Minister Narendra Modi (AFP photo)

Since it would not have been possible to spare serving government doctors at this time, the decision attempts to address the urgent needs of the Gulf countries without compromising with the healthcare requirements of people in India.

PM Modi and Foreign Minister S Jaishankar, who have received numerous requests for Indian assistance from Gulf countries over the Covid-19, had earlier ordered officials to prioritise approvals to their requests for dispatch of millions of paracetamol and hydroxychloroquine tablets.

So far, 45 million hydroxychloroquine tablets and 11 metric tonnes of HCQ's active pharmaceutical ingredients have been cleared to be shipped on a commercial basis to six Gulf countries, Bahrain, Jordan, Oman, Qatar, Saudi Arabia and the United Arab Emirates.

Another 22.7 million units of paracetamol were also cleared for Kuwait and the UAE before the government lifted export controls on the medicine on 17 April. Some more consignments of paracetamol were subsequently cleared for the two countries, apart from Iraq and Yemen.

Officials suggest India had gone out of its way to cater to the requirements of the Gulf countries at this crucial juncture, gestures that have been warmly reciprocated by the West Asian countries. Like when the UAE was packing off immigrants from every other country following the outbreak of the pandemic, India requested Kuwait and the United Arab Emirates to go slow with repatriating Indian nationals because the state governments didn't have the infrastructure to deal with the influx.

This request was accepted though around the same time, the messaging to the rest of the world was that the government could impose restrictions on return of workers later from countries that don't evacuate their nationals.

"It is in this context", a foreign ministry official said, "that the unseemly controversy over a cabinet note in Kuwait should be seen". The document, which spoke about Muslims being targeted in India, was leaked around the same time that Kuwait was requesting India to make an exception and send Indian doctors and healthcare professionals.

It was an effort by vested interests - possibly linked to pro-Pakistan elements in the kingdom - to influence the narrative around India's deepening ties with Gulf countries. In any case, a minister in the Indian government said, even at meetings of the Union Cabinet in Delhi, all issues and topics under the Sun are discussed. "That does not mean that the view being discussed reflects the stand of the government," he said.

Officials underline how the concerns referred to in the Kuwaiti document echoed the narrative that Pakistan Prime Minister Imran Khan had been trying to build for some time.

Foreign minister Makhdoom Shah Mahmood Qureshi had promptly weighed in, calling for a coordinated effort against coronavirus. "Unfortunately, what we're seeing is that though this virus respects no borders, it doesn't differentiate between ethnicities or religion — yet in India [...] they're in the grip of Islamophobia," he said, according to a report in Pakistan's newspaper Dawn's website.

<https://www.hindustantimes.com/india-news/pm-modi-green-lights-uae-kuwait-request-for-ex-military-doctors-nurses/story-fc6THXnkTBVLTSMRgZbhdL.html>



Thu, 30 April 2020

India's military spending may sound impressive, but it is not in real terms

By Rajesh Singh

India has emerged as the third-largest military spender, lagging behind only the US and China. A recent report on defence spending by India is likely to trigger demands for a cut in the country's military expenditure and the use of the saved allocation to boost the social sector. While the call for more resources in areas of health, education and family welfare etc can be justified, it would be improper to punish the defence sector in the process. Because the story of India's defence spending goes beyond the headlines the latest report has thrown up.

Swedish think-tank Stockholm International Peace Research Institute (SIPRI) has, in a recent report, identified India as among the world's three biggest military spenders in 2019. India's spending was \$71.1 billion. This sounds big, and in percentage terms, it's equally impressive — at a 6.8 per cent increase over 2018, it is more than the hike registered by the other regional power, China (5.1 per cent).

The report also stated that India's military spending grew by nearly 259 per cent in the period 1990-2019 and by 37 per cent in the last decade. India has emerged as the third-largest military spender, lagging behind only the US and China. In 2019, it spent more than Russia and Saudi Arabia, the other two nations comprising the world's top five military spenders, the SIPRI report titled, 'Trends in World Military Expenditure 2019', said.

"The revenue head also caters to some other major expenses such as transportation and repairs, both of which are critical components in having a fit and running Armed Forces."

Now let's look at some other figures that offer a more holistic picture. The \$71.1 billion India spent is peanuts compared to that by China and the US. China's military expenditure in 2019 was \$261 billion, while that of the US was \$732 billion for the same period. Thus, India's contribution to the global military spending of \$1917 billion is only a small fraction as compared to these two countries; China's is nearly 14 per cent. Domestically speaking, the share of military spending to its GDP actually fell over the last decade from 2.7 per cent to 2.4 per cent. Even this small percentage would look worse if one were to exclude huge expenses such as defence pensions. For instance, in the last Budget for 2020-21, the allocation made for the defence sector (if one excludes the pension component), accounts for just 1.5 per cent the country's GDP.

Those who express alarm at the 37 per cent increase in our defence expenditure over the previous decade, need to look not beyond Pakistan, one country whose threat perceptions India's defence planners have to forever bear in mind. In the corresponding period, Pakistan's defence spending went up by and much as 70 per cent — nearly twice the increase India posted. Not just that, its defence expenditure to its share of the GDP has also steadily gone up; from 3.4 per cent in 2010 to four per cent in 2019, according to SIPRI.

If anything, there is a need to get out of this rut of 2-3 per cent of GDP and provide far more to the defence sector in the Budget if the Modi government needs to keep its big-ticket projects to fortify the country's defence preparedness on track. The 2020-21 Budget saw a hike of only 5.8 per cent in allocations over the previous financial year. Of the Rs 3.37 lakh crore, the defence sector

has been allocated, the capital outlay (which takes care of acquisitions and modernisations) is Rs 1.18 lakh crores; it was Rs 1.08 lakh crore in the Budget Estimates for 2019-20. Just how this marginal increase can take care of the nation's pressing defence needs, remains a matter of concern. Of course, the government has repeatedly assured that funds would not be a constraint, but it would be nice to see that reflected in more robust defence budgets.

It is true that the revenue head expenses continue to be larger than the capital outlay. That may be understandable, since revenue head expense includes pay and allowances, including increments in salaries etc that come from time to time — as well as other pending dues, such as in the case of the One Rank One Pension scheme. The revenue head also caters to some other major expenses such as transportation and repairs, both of which are critical components in having a fit and running Armed Forces. But what is less understandable, and justified, is the near freeze on revenue head expenses as well. As the mandate of our Navy, Army and Air Force expands, given the country's geo-strategic needs, both capital outlay and revenue expenditure have to match such ambitions.

“Several studies conducted by reputed organisations have argued for higher allocation for defence spending for India in the Annual Budget.”

It is a given that arguably no country's defence force gets all the money it desires or demands. But the defence sector should also not be left crippled. Even a casual look at India's defence spending will reveal that our policymakers have reacted to the issue in knee-jerk manners. There are promises of more money for the defence forces in the wake of a military crisis imposed by outside challenges; funds are even mysteriously found for the military. But with the passage of time, the defence sector gets back to receiving a raw deal.

Several studies conducted by reputed organisations have argued for higher allocation for defence spending for India in the Annual Budget. On the other hand, there are those who argue that whining about low allocation is an exercise in vain; the military must learn to make the optimum use of what it has and can realistically get in the near future. India, after all, is not a rich or developed country. It has other, more pressing priorities. That may be so, but the price of giving step-motherly treatment to the defence sector will outweigh the advantages.

<https://idrw.org/indias-military-spending-may-sound-impressive-but-it-is-not-in-real-terms/#more-226552>



Thu, 30 April 2020

T S Tirumurti appointed India's Permanent Representative to the UN succeeding Akbaruddin

Seasoned diplomat T S Tirumurti, currently serving as Secretary in the Ministry of External Affairs, was on Wednesday appointed as India's Permanent Representative to the United Nations. A 1985-batch Indian Foreign Service officer, Tirumurti succeeds Syed Akbaruddin who is credited with effectively presenting India's position on a range of crucial issues at the global body's headquarters in New York for last several years.

Akbaruddin, one of the most visible faces of Indian diplomacy, played a crucial role in pushing for designation of Pakistan-based Jaish-e-Mohammed chief Masood Azhar as a “global terrorist” by the UN as well as in stalling China's efforts to raise the Kashmir issue at the world body.



Akbaruddin has been serving as India's Permanent Representative at the UN since January 2016. He is due for retirement shortly.

"Tirumurti has been appointed as the next Ambassador/Permanent Representative of India to the United Nations at New York," the MEA said in a statement.

At present, he is holding the key position of Secretary, Economic Relations, at the MEA headquarters in Delhi.

As part of a diplomatic reshuffle, the government also appointed Jaideep Mazumdar as India's ambassador to Austria. At present, Mazumdar is serving as Indian envoy to the Philippines.

Joint Secretary Deepak Mittal was appointed as India's Ambassador to Qatar, a country considered important in the Gulf region. Mittal is currently serving as joint secretary in the Pakistan, Afghanistan and Iran (PAI) division of the ministry.

Another senior diplomat, Piyush Srivastava, has been named India's next Ambassador to Bahrain. At present, he is serving as Joint Secretary in the Nepal and Bhutan division of the ministry.

The government has also appointed senior diplomat Namrata S Kumar as India's next ambassador to Slovenia.

<https://idrw.org/t-s-tirumurti-appointed-indias-permanent-representative-to-the-un-succeeding-akbaruddin/#more-226561>

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ThePrint

Thu, 30 April 2020

Special Forces meant to do ops like surgical strikes. They're called 'special' for a reason

India's Special Forces are equipped reasonably, but not with the latest technology. It is time we provided them the latest and the best that's available

By Lt. Gen. A.K. Singh (Retd)

Two incidents in recent days caught my imagination, both related to Para SF, the elite forces of the Indian army.

The first was an encounter along the Line of Control in Jammu and Kashmir, where, in a close quarter fight, five fully-armed terrorists were eliminated. We also lost five Para SF soldiers — all belonging to the 4 Para Special Forces, which had undertaken the famed surgical strikes.

Second was the demise of a braveheart, Col Navjot Singh Bal, Shaurya Chakra, former commanding officer (CO) of 2 Para SF, who even in the ultimate test, stoically faced his fate, smiling, like the Warriors of Yore.

Many thoughts traversed my mind. What is that special ethos that motivates these men of the SF to make the ultimate sacrifice? I also ended up enquiring to a few SF Officers if the operation in J&K had proved rather costly? Shouldn't we minimise our casualties?

Col Saurabh Shekhawat, KC, SC, SM, VSM, India's highest decorated serving soldier replied cryptically: "Sir we do our best to minimise casualties through intense training and planning, but once the battle is joined, it's *Vijay Ya Veergati* (victory or martyrdom)."

Having had the good fortune to have some of the finest SF units under my command, including the Para Centre at Bangalore, I do have an idea what goes into the selection and making of a Para SF leader and soldier.

Raison d'être for Special Forces

Every nation needs to decide what its special forces are meant for. According to Stephen Cohen, "The task of special forces is the proxy application of force at low and precisely calculated levels, the objective being to achieve some political effect, not a battlefield victory".

But, as Lt Gen P. C. Katoch, a war veteran of the SF, states: "In sharp contrast, in India, we have been simply looking at battlefield victory. SF units are deployed more on tactical missions rather than the broader, strategic and unconventional missions that should be their charter". Rahul Bedi also echoes the same in an article in *The Citizen* that the SF have often ended up as substitutes for conventional forces in counter-insurgency operations, for tasks that should be undertaken by regular infantry.

India's Para SF are equipped reasonably, but not with the latest technology. It is time we provided them with the latest and the best that today's revolution in military affairs offers: drones of all types, space and cyber-based applications among others.

Unconditional ownership of the SF

Combat has always been and continues to be most brutal, challenging, unforgiving and the ultimate test of the human spirit. This is also the *raison d'être* of the special forces, for they exist only for special missions and combat. Facing special challenges requires a very high level of individual proficiency in the skills peculiar to SF. But more than that, it's the combined combat capabilities of the squad/team that matters more. And this calls for very high levels of trust and unconditional ownership of the plan and the follow-up action. Anything less would not do. This involves trusting your life with your buddy/squad and ownership of both success and failures, for no plan survives the first contact. In fact, there are more lessons to be learnt in failures.

The Indian Para SF holds the ethos of unconditional and extreme ownership. Trust, of course, is the glue that binds the SF together. Trust that has been earned and created through living and training together under most severe conditions for prolonged periods. Innovation, ingenuity, boldness and risk-taking ability are key facets of it.

Leadership is the ultimate force multiplier

Superlative leadership, especially at the officer's level is the acknowledged hallmark of the Indian Army. Same is the case with the Para SF. But because of the decentralised nature of their operations, leadership at the JCO and NCO level becomes equally important. And these leaders have to deliver, for they are conscious of the fact that in the ultimate analysis what matters is the success of their mission. The SF junior leaders have to not only be masters of their trade, but also have the sharpness of intellect and battlefield intuition to put their finger on the right course of action, under severely stressful and time-constrained operational situations.

The SF officers are a breed apart, single-minded in their devotion to their profession, almost to an extreme. A large number of them have risen to high ranks, but some have also paid the price of not being able to adjust to life outside the uniform when they call it quits. And this is not peculiar to the Indian Para SF, but a phenomenon seen across the special forces in many nations. Lt Gen Vinod Bhatia, a para officer of repute and erstwhile DGMO, sums it up well: "A bunch of misfits who fit well together. For the hazardous tasks they are called upon to undertake, they have to be special in all respects".

Optimising the Para SF

Most Para SF Officers recognise that in peacetime, employment of SF in counter insurgency/counter terrorism (CI/CT) tasks gives them valuable combat experience. But continuous employment also detracts and is detrimental to their combat edge, attitude and training, required for the specialised tasks at operational/strategic levels in war. I would tend to agree that short-term focus should not govern the deployment and employment of SF in peacetime. Para SF is a very precious force multiplier and should be used judiciously.

The country must provide the SF, all that they need and more. The Defence Procurement Procedure must make a special provision for the SF. Anything less would be unacceptable dereliction on the part of those responsible. The SF should be provided the highest priority under

the charter of the chief of defence staff and the department of military affairs. The equipment provided must be of top quality whether indigenous or from abroad. During the current pandemic crisis, where all procurement has been put on hold, the SF procurement should be allowed to proceed on fast track. The financial outgo would be limited.

AFSOD needs nurturing

The creation of the Armed Forces Special Operations Division (AFSOD) is a good first step to capitalise on the SF capabilities for strategic-politico-military tasks, including out of area contingencies.

While some dedicated allocations have been made from the SF of the three Services, it's still a work in progress and needs careful nurturing, as also support from the three Services, especially the Army.

The AFSOD has great potential to fill the existing gap at the politico-strategic-military level. The importance of providing it with dedicated assets (including aircraft), intelligence on a regular basis and an SF adviser of appropriate rank cannot be overstated. In peacetime, we should also provide them with discreet exposure in countries of interest.

Minimising casualties

Most analysts tend to avoid this, not wanting to question the professionalism and sacrifice of officers and soldiers, including in Special Forces. Based on my own convictions, while in service and even now, I am quite convinced that the Indian Army is losing more soldiers in CI/CT operations than is desirable and maybe, some steps can be taken to minimise our casualties.

To get a correct understanding, let's look at two perspectives with respect to Para SF.

The first is at the unit/lower level, where the ethos are *Balidan* (sacrifice) and *Vijay ya Veergati*. It is not possible for the CO of an SF unit to lower this very high benchmark and combine it with caution because, as any SF officer will tell you, once the battle is joined the focus is on getting the job done, efficiently and with a ruthless streak to eliminate the target. The SF have also undertaken a large number of clean operations with no casualties, but the risk is ever-present and part of the job. My concern is mostly at a higher level, where tasking is done and requisite support provided. It is for the senior leadership to ensure that the SF are used only for critical missions, and once the tasking is done, they are allowed to complete the task as they know best, without undue pressure of time/ deadlines.

This is a truth that needs to be acknowledged at the highest level and rectified. As a senior SF officer told me: losing a valuable officer or trooper in CI/CT operations is always painful, and it is for the senior officers to be mindful of this. Once the target/ terrorist is locked, we will get him, tomorrow, if not today.

The other responsibility on senior leadership is to provide the best technology in terms of UAVs/Drones and other surveillance, with a continuous live feed to the team undertaking the operation. This will certainly reduce unnecessary casualties. I am of the firm belief that gone are the days when a senior leader's focus was "Mission at any cost". Today we need military leaders who will accomplish the "Mission at least cost".

(The author is a former Army commander and lieutenant governor. Views are personal.)

<https://theprint.in/opinion/special-forces-ops-surgical-strikes-special-reason/410858/>

Army wants spouses to learn history, global affairs & ability to avail social schemes for troops

By Ajay Banerjee

New Delhi: In an attempt to give Army wives welfare association (AWWA) a wider role, the Indian Army has moved a concept note of having a deeper 'spouse support system'.

This looks to train the spouses of young officers on reading up on the history of the Army and how to handle social media.

As the officer rises in ranks, the spouse is briefed on global issues.

Most importantly, the Army wants the AWWA to effectively link to Government of India (GoI) schemes for women like Sukanya Samridhi Scheme, Mudra Loan, Awas Yojana, Ujwala scheme, which will help the wives and daughter of troops.

The note has not yet been approved for implementation.

The need has been felt that as the husband rises in service, the spouse is asked to shoulder wider responsibilities.

These may be associated with managing Army-run schools in remote areas, skilling centres, medical outfits, enabling vocational pursuits, hostels for children, shopping arcades within military stations, issues related to social maladjustment or marital discord among troops.

"These responsibilities which were once merely 'ex - officio', have to be dealt with in a far more engaged manner today, because they have become more complex and have acquired financial and legal overtones," says the 37-page concept note which has been circulated.

Rising aspirations means there is a need to transit to a more modern framework of engagement.

The note observes that Army spouses are presently employing 'empathy' to redress myriad issues such as alcoholism, discord, stress, self-harm, anxiety or depression.

The spouse, unless being a trained professional in the field, does not have the competence to discern patterns of suicidal tendencies, anxiety or clinical depression, at any such voluntary counselling of the wives of troops.

In the Army, the wives of the troops can lodge a complaint to the AWWA in case of a marital discord.

The AWWA, headed by the wife of Army Chief is an NGO.

The Army prefers it that way to keep matters within and prevent any long-winded legal wrangling the troops may face.

Based on an internal analysis, the Army's idea of 'spouse training' including upgrading the skills to manage change and ensure feedback on family matters.

The Army spouses will be trained to have basic working knowledge of law to be able to appreciate legal advice on litigations in family courts.

The spouses of senior generals should have developed a high level of security consciousness aligned to the prevailing geo-political situation in the country as also the security outlook of the Indian Army.

This is needed as spouses are present at major international functions.

"To know what not to say at these events is vital," said an official adding that the concept is followed by the US forces.

<https://www.tribuneindia.com/news/nation/army-wants-spouses-to-learn-history-global-affairs-ability-to-avail-social-schemes-for-troops-78099>

Thu, 30 April 2020

Aero India to stay in Bengaluru in 2021

The decision ends speculation that the airshow would be shifted out of Bengaluru to Lucknow
By Prajwal Bhat

Aero India, the biennial air show and aviation exhibition will be held in Bengaluru in 2021 from February 3 to 7 at the Yelahanka Airforce Station in the city.

This was confirmed on the official Aero India website by the Defence Exhibition Organisation (DEO) which is attached to the Ministry of Defence.

The decision ends speculation that the airshow would be shifted out of Bengaluru to Lucknow. However, the proposal to hold the event in Lucknow was shelved due to the lack of infrastructure to host an event of this size and scale. Instead, Lucknow was picked as the venue for DefExpo held earlier this year.

Bengaluru has hosted the Defence Ministry's biennial Aero India event since its debut in 1996. The event in 2021 will be the thirteenth edition of India's flagship aviation event.

The Ministry of Defence and the air show organisers are yet to reveal more details about the event in 2021.

In March, Karnataka Chief Minister BS Yediyurappa wrote to the Centre asking for the event to be held in Bengaluru next year. The Chief Minister handed over a letter to Defense Minister Rajnath Singh.

The last edition of Aero India in 2019 had witnessed tragedy. Two Hawk jets of the IAF aerobatics team crashed into each other resulting in the death of a pilot and injuries to two more in 2019. In addition, a major fire gutted hundreds of cars in the parking lot of the event.

The event is a showcase of the Indian Air Force's latest jets and fighter planes. It is also an opportunity for the international aviation industry to display their innovations and models to the Indian government.

Preparations for the grand event typically begin a year in advance. However, when the event was held in 2019, it was confirmed only in September 2018, around five months before the event was held in February 2019.

<https://www.thenewsminute.com/article/aero-india-stay-bengaluru-2021-123614>

Russia under lockdown, 4 IAF pilots training for manned space mission confined indoors near Moscow

A couple of months after their training began at the Gagarin Cosmonaut Training Center (GCTC) in Star City near Moscow, it has been put on hold -- and the pilots remain confined to their rooms while Russia grapples with the pandemic

By Sushant Singh

New Delhi: While the four Indian Air Force (IAF) fighter pilots selected to be trained as astronauts for the country's first manned space flight may have been motivated by the adventure of space travel, they would not have anticipated the series of events triggered by the spread of the novel coronavirus.

A couple of months after their training began at the Gagarin Cosmonaut Training Center (GCTC) in Star City near Moscow, it has been put on hold — and the pilots remain confined to their rooms while Russia grapples with the pandemic. Russia had reported nearly 1 lakh positive cases, with 972 deaths until Wednesday evening.

“The four astronauts-elect are in good health. The highly professional medical experts of GCTC are constantly observing them,” Director General of Glavkosmos JSC Dmitry Loskutov told The Indian Express. Glavkosmos is the Russian government-owned space business company, which signed a contract with the Indian Space Research Organisation (ISRO) in June 2019 for the training of the Indian astronauts.

“The lockdown has strongly been recommended for the astronauts-elect, as well as for the GCTC personnel. The decision to resume the full-scale training will be taken after a thorough observation of the epidemic situation in the country,” Loskutov said. Russia's President Vladimir Putin had initially announced a lockdown until April 30, but extended it until May 11 on Tuesday, with the warning that the country had not yet reached the peak of infections, and “a hard and difficult path lies ahead”.

GCTC was in the news after Natalya Lebedeva, a doctor who contracted the coronavirus in Star City, died after falling from a hospital window last week. Lebedeva, the chief of emergency medicine at the Medical-Sanitary Unit No. 2 in Star City, had been involved in treating one of the heads of the GCTC, as per the Moskovsky Komsomolets newspaper.

Having started their year-long training in Russia in early February, the four fighter pilots have completed approximately a fourth of their course so far, Loskutov said. Their schedule of training has been met so far, even though the Russian authorities implemented the lockdown on March 28.

“All astronauts-elect continue working according to their training plan,” Loskutov said, adding that the four Indians had “successfully passed the exam on the knowledge of the onboard systems of the manned spacecraft”. They are to take the exam in manned spacecraft flight theory, he said, and are “preparing for the exam independently”.

The four pilots are yet to be trained to take appropriate actions during emergencies — if, for example, the spacecraft has to make an abnormal landing in unplanned climate and geographic zones. This physically challenging portion of the training, which includes winter, sea, and desert survival, is scheduled to be held after the lockdown is lifted.

Besides the four astronauts, there is one flight surgeon and an ISRO official too, in Russia currently. The flight surgeons for the mission are selected IAF doctors who are specialists in aviation medicine. They are scheduled to be sent to Russia for training by rotation.

They are responsible for the health of astronauts before, during, and after the space flight, and are supposed to work closely with the astronauts during the training period to develop a strong personal understanding. Their month-long training in Russia too, has been put on hold because of the lockdown.

After the Russian part of their training and preparation, the astronauts-elect will be trained in India for the mission. Russia and India share a history of cooperation in space exploration, with first the Indian cosmonaut, Rakesh Sharma, having flown aboard the Soyuz T-11 launched in April 1984.

In August 2018, Prime Minister Narendra Modi announced that India would send its first national spacecraft and crew to the International Space Station (ISS) around 2022. The mission, named Gaganyaan, aims to demonstrate human spaceflight capability to low earth orbit for a mission duration ranging from one orbital period to a maximum of seven days. A GSLV Mk-3 will be used to carry the orbital module, which will have necessary provisions for sustaining a three-member crew for the duration of the mission.

Prior to the manned spaceflight, India has also planned for two unmanned launches of Gaganyaan — the first of which is scheduled for December. However, there are apprehensions that these may now be delayed, as all space projects have come to a halt following the spread of COVID-19. ISRO itself has been in a lockdown since March 25, following the central government's announcement.

<https://indianexpress.com/article/india/india-russia-gaganyaan-iaf-coronavirus-lockdown-6385614/>

MERCOM
India | clean energy news and insights

Thu, 30 April 2020

Indian scientists come up with an improved pseudocapacitor to store electrical energy

With further developments, it can be used as a viable alternative to batteries

By Rakesh Ranjan

In a novel discovery, scientists at the Institute of Nano Science and Technology (INST) have come up with new material for supercapacitors or pseudocapacitors, which can store electrical energy by electron charge transfer. INST is an autonomous institute under the Department of Science & Technology, Government of India.

This latest material can be used as an alternative to batteries as it offers a low-cost, highly scalable energy storage solution, according to the press release.

Ramendra Sundar Dey and his team of researchers at the INST have developed a new and exciting capability to overcome the long-standing challenges of pseudocapacitors, which includes their cycling stability and rate capability. Pseudocapacitors are a type of supercapacitors which store electrical energy by electron charge transfer.



The team at INST has developed a pseudocapacitive material, which is a hybrid xerogel structure for the very first time. The material was developed by combining dopamine onto a conductive matrix, like graphene.

Notably, this class of xerogel architectures has been reported to be an alternative to conventional pseudocapacitors. Still, they lack sufficient cycling stability to provide a viable alternative to batteries in the consumer market.

The researchers at INST investigated the reasons behind the fall in the performance of the active materials during long service hours and came up with a new synthetic approach. It was then correlated with the overall performance with explanation and theoretical support provided by Abir De Sarkar, who is also from the same institute.

Pseudocapacitors show a great promise as a low-cost and efficient energy storage solution, and there is every chance that it can be used for commercial applications. However, there are still some hurdles in the way.

The scientists at INST came up with this unique material by using a two-step synthesis procedure that is tailored in a way to take full structural advantage of the hybrid material. To develop the material, first, they used the hydrothermal synthesis method. Then they introduced the in situ electrochemical polymerization method to boost the overall storage capacity as well as the cycling stability.

A detailed study of the synthetic approach, as well as the mechanism of the redox supercapacitors at the molecular level, will go a long way in solving the issues of stability and inferior power output of pseudocapacitors and this bodes well for the future.

Recently, researchers from the Skoltech Center for Energy Science and Technology (CEST) came up with a new cathode material based on titanium fluoride phosphate, which is stated to be stable and has achieved superior performance at high discharge currents.

Earlier, scientists at Drexel University developed a new class of materials that can store electrical energy very quickly called MXene, which is two-dimensional titanium carbide. It works like a battery and can store a large amount of electrical energy through electrochemical reactions- but unlike batteries, they can be charged and discharged very quickly.

<https://mercomindia.com/indian-scientists-come-up-improved-pseudocapacitor/>



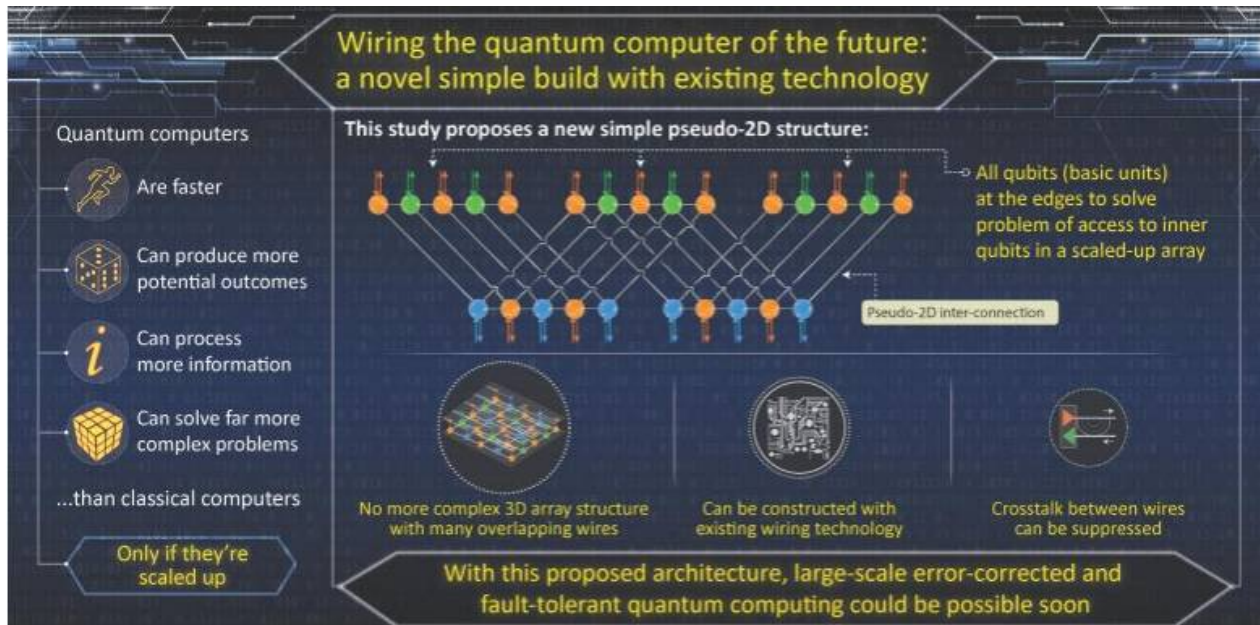
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Thu, 30 April 2020

Quantum Computer of the Future: A Novel 2D build with existing technology

*The basic units of a quantum computer can be rearranged
in 2D to solve typical design and operation challenges*

Quantum computing is increasingly becoming the focus of scientists in fields such as physics and chemistry, and industrialists in the pharmaceutical, airplane, and automobile industries. Globally, research labs at companies like Google and IBM are spending extensive resources on improving quantum computers, and with good reason. Quantum computers use the fundamentals of quantum mechanics to process significantly greater amounts of information much faster than classical computers. It is expected that when error-corrected and fault-tolerant quantum computation is achieved, scientific and technological advancement will occur at an unprecedented scale.



Constructing a small-scale circuit to further examine and explore the possibility. Credit: Tokyo University of Science

But, building quantum computers for large-scale computation is proving to be a challenge in terms of their architecture. The basic units of a quantum computer are the “quantum bits” or “qubits.” These are typically atoms, ions, photons, subatomic particles such as electrons, or even larger elements that simultaneously exist in multiple states, making it possible to obtain several potential outcomes rapidly for large volumes of data. The theoretical requirement for quantum computers is that these are arranged in two-dimensional (2D) arrays, where each qubit is both coupled with its nearest neighbor and connected to the necessary external control lines and devices. When the number of qubits in an array is increased, it becomes difficult to reach qubits in the interior of the array from the edge. The need to solve this problem has so far resulted in complex three-dimensional (3D) wiring systems across multiple planes in which many wires intersect, making their construction a significant engineering challenge.

A group of scientists from Tokyo University of Science, Japan, RIKEN Centre for Emergent Matter Science, Japan, and University of Technology, Sydney, led by Prof Jaw-Shen Tsai, proposes a unique solution to this qubit accessibility problem by modifying the architecture of the qubit array. “Here, we solve this problem and present a modified superconducting micro-architecture that does not require any 3D external line technology and reverts to a completely planar design,” they say. This study has been published in the *New Journal of Physics*.

The scientists began with a qubit square lattice array and stretched out each column in the 2D plane. They then folded each successive column on top of each other, forming a dual one-dimensional array called a “bi-linear” array. This put all qubits on the edge and simplified the arrangement of the required wiring system. The system is also completely in 2D. In this new architecture, some of the inter-qubit wiring—each qubit is also connected to all adjacent qubits in an array—does overlap, but because these are the only overlaps in the wiring, simple local 3D systems such as airbridges at the point of overlap are enough and the system overall remains in 2D. As you can imagine, this simplifies its construction considerably.

The scientists evaluated the feasibility of this new arrangement through numerical and experimental evaluation in which they tested how much of a signal was retained before and after it passed through an airbridge. Results of both evaluations showed that it is possible to build and run this system using existing technology and without any 3D arrangement.

The scientists’ experiments also showed them that their architecture solves several problems that plague the 3D structures: they are difficult to construct, there is crosstalk or signal interference between waves transmitted across two wires, and the fragile quantum states of the qubits can degrade. The novel pseudo-2D design reduces the number of times wires cross each other, thereby reducing the crosstalk and consequently increasing the efficiency of the system.

At a time when large labs worldwide are attempting to find ways to build large-scale fault-tolerant quantum computers, the findings of this exciting new study indicate that such computers can be built using existing 2D integrated circuit technology. “The quantum computer is an information device expected to far exceed the capabilities of modern computers,” Prof Tsai states. The research journey in this direction has only begun with this study, and Prof Tsai concludes by saying, “We are planning to construct a small-scale circuit to further examine and explore the possibility.”

Reference: “Pseudo-2D superconducting quantum computing circuit for the surface code: proposal and preliminary tests” by Hiroto Mukai, Keiichi Sakata, Simon J Devitt, Rui Wang, Yu Zhou, Yukito Nakajima and Jaw-Shen Tsai, 21 April 2020, *New Journal of Physics*. DOI: [10.1088/1367-2630/ab7d7d](https://doi.org/10.1088/1367-2630/ab7d7d)

Tokyo University of Science (TUS) is a well-known and respected university, and the largest science-specialized private research university in Japan, with four campuses in central Tokyo and its suburbs and in Hokkaido. Established in 1881, the university has continually contributed to Japan’s development in science through inculcating the love for science in researchers, technicians, and educators.

With a mission of “Creating science and technology for the harmonious development of nature, human beings, and society”, TUS has undertaken a wide range of research from basic to applied science. TUS has embraced a multidisciplinary approach to research and undertaken intensive study in some of today’s most vital fields. TUS is a meritocracy where the best in science is recognized and nurtured. It is the only private university in Japan that has produced a Nobel Prize winner and the only private university in Asia to produce Nobel Prize winners within the natural sciences field.

<https://scitechdaily.com/quantum-computer-of-the-future-a-novel-2d-build-with-existing-technology/>



Thu, 30 April 2020

Engineers make a promising material stable enough for use in solar cells

Simple change to perovskite surface removes barrier to its functionality

West Lafayette, Ind. — Soft and flexible materials called halide perovskites could make solar cells more efficient at significantly less cost, but they’re too unstable to use.

A Purdue University-led research team has found a way to make halide perovskites stable enough by inhibiting the ion movement that makes them rapidly degrade, unlocking their use for solar panels as well as electronic devices.

The discovery also means that halide perovskites can stack together to form heterostructures that would allow a device to perform more functions.

The results published in the journal *Nature* on Wednesday (April 29). Other collaborating universities include Shanghai Tech University, the Massachusetts Institute of Technology, the University of California, Berkeley, and the U.S. Department of Energy’s Lawrence Berkeley National Laboratory.

Researchers already have seen that solar cells made out of perovskites in the lab perform just as well as the solar cells on the market made of silicon. Perovskites have the potential to be even more efficient than silicon because less energy is wasted when converting solar energy to electricity.

And because perovskites can be processed from a solution into a thin film, like ink printed on paper, they could be more cheaply produced in higher quantities compared to silicon.

“There have been 60 years of a concerted effort making good silicon devices. There may have been only 10 years of concerted effort on perovskites and they’re already as good as silicon, but they don’t last,” said Letian Dou (lah-TEEN dough), a Purdue assistant professor of chemical engineering.

A perovskite is made up of components that an engineer can individually replace at the nanometer scale to tune the material’s properties. Including multiple perovskites in a solar cell or integrated circuit would allow the device to perform different functions, but perovskites are too unstable to stack together.

Dou’s team discovered that simply adding a rigid bulky molecule, called bithiophenylethylammonium, to the surface of a perovskite stabilizes the movement of ions, preventing chemical bonds from breaking easily. The researchers also demonstrated that adding this molecule makes a perovskite stable enough to form clean atomic junctions with other perovskites, allowing them to stack and integrate.

“If an engineer wanted to combine the best parts about perovskite A with the best parts about perovskite B, that typically can’t happen because the perovskites would just mix together,” said Brett Savoie (SAHV-oy), a Purdue assistant professor of chemical engineering, who conducted simulations explaining what the experiments revealed on a chemical level.

“In this case, you really can get the best of A and B in a single material. That is completely unheard of.”

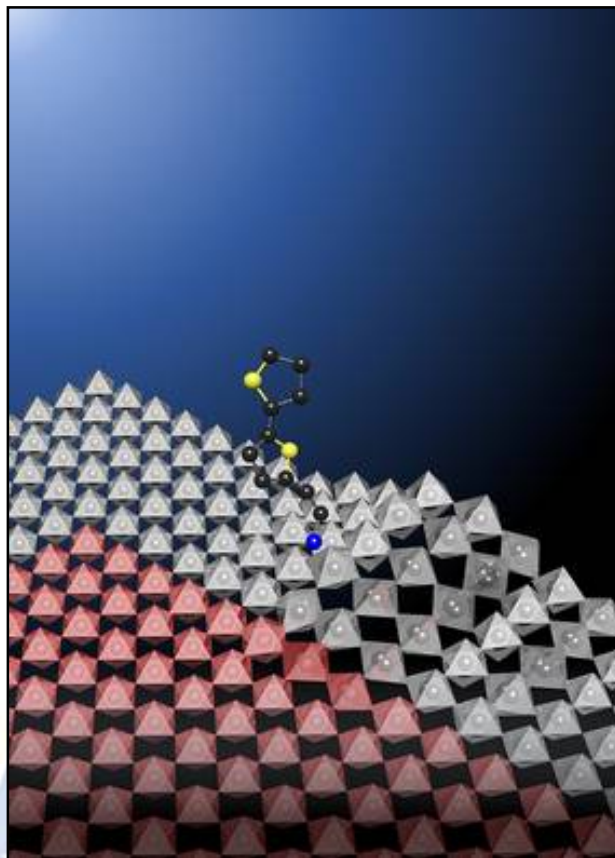
The bulky molecule allows a perovskite to stay stable even when heated to 100 degrees Celsius. Solar cells and electronic devices require elevated temperatures of 50-80 degrees Celsius to operate.

These findings also mean that it could be possible to incorporate perovskites into computer chips, the researchers said. Tiny switches in computer chips, called transistors, rely on tiny junctions to control electrical current. A pattern of perovskites might allow the chip to perform more functions than with just one material.

The work is supported by multiple entities including the U.S. Office of Naval Research (N00014-19-1-2296), the National Science Foundation (1939986-ECCS), the U.S. Department of Energy, the U.S. Air Force Office of Scientific Research, and Purdue University’s Davidson School of Chemical Engineering and Birck Nanotechnology Center, located in Discovery Park.

About Discovery Park

Discovery Park is a place where Purdue researchers move beyond traditional boundaries, collaborating across disciplines and with policymakers and business leaders to create solutions for a better world. Grand challenges of global health, global conflict and security, and those that lie at the nexus of sustainable energy, world food supply, water and the environment are the focus of researchers in Discovery Park. The translation of discovery to impact is integrated into the fabric of Discovery Park through entrepreneurship programs and partnerships.



Just adding a bulky molecule to the surface of a perovskite might finally make the material stable enough for incorporating into solar panels. (Purdue University illustration/Enzheng Shi)

About Purdue University

Purdue University is a top public research institution developing practical solutions to today's toughest challenges. Ranked the No. 6 Most Innovative University in the United States by U.S. News & World Report, Purdue delivers world-changing research and out-of-this-world discovery. Committed to hands-on and online, real-world learning, Purdue offers a transformative education to all. Committed to affordability and accessibility, Purdue has frozen tuition and most fees at 2012-13 levels, enabling more students than ever to graduate debt-free. See how Purdue never stops in the persistent pursuit of the next giant leap at purdue.edu.

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<https://www.purdue.edu/newsroom/releases/2020/Q2/engineers-make-a-promising-material-stable-enough-for-use-in-solar-cells.html>



Thu, 30 April 2020

KIST develops stretchable lithium-ion battery based on new micro-honeycomb structure

A Korean research team has developed a lithium-ion battery that is flexible enough to be stretched

The microscale reentrant-honeycomb shaped, graphene-based electrode is characterized by an accordion-like structural stretchability. A stretchable gel electrolyte and stretchable separator are also developed for all-component stretchable full cells, applying for future stretchable devices.

A Korean research team has developed a lithium-ion battery that is flexible enough to be stretched. Dr. Jeong Gon Son's research team at the Photo-Electronic Hybrids Research Center at the Korea Institute of Science and Technology (KIST) announced that they had constructed a high-capacity, stretchable lithium-ion battery. The battery was developed by fabricating a structurally stretchable electrode consisting solely of electrode materials and then assembling with stretchable gel electrolyte and stretchable packaging.

Rapid technological advancements in the electronics industry have led to a fast-growing market for high-performance wearable devices, such as smart bands and body-implantable electronic devices, such as pacemakers. These advancements have considerably increased the need for energy storage devices to be designed in flexible and stretchable forms that mimic human skin and organs.

However, it is very difficult to impart the stretchability to the battery because the solid inorganic electrode material occupies most of the volume, and other components such as current collectors and separators must also be made stretchable. In addition, the problem of liquid electrolyte leakage under deformation also should be solved. , and the problem of leaking the liquid electrolyte must also be solved.

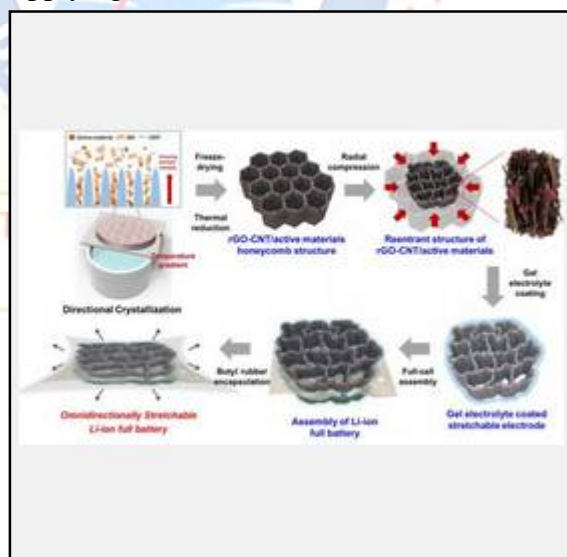


IMAGE: Schematic diagram of stretchable battery manufacturing process [view more](#)

In order to address these problems, Dr. Jeong Gon Son's research team at KIST focused on creating an accordion-like micro-structure, which gives structural stretchability to non-stretchable materials, and thus constructed a micro-inwardly curved electrode framework in a honeycomb shape. The inwardly protruded honeycomb framework consisted of atom-thick graphene, which serves as a curtain, and carbon nanotubes, which formed a nano-size rope. The honeycomb-shaped composite framework, made of active materials, graphene, and carbon nanotubes, was inwardly protruded like an accordion using a radial compression process, resembling the rolling of Korean rice rolls (gimbap), which resulted in the creation of stretchable properties.

The electrodes developed by the research team do not contain any materials typically used for stretchability, such as rubber, that do not facilitate energy storage. All of the materials used by the research team in their newly developed battery are fully utilized in energy storage and charge transport. In fact, the stretchable battery created by the team showed an energy storage capacity (5.05 mAh/cm²) that is as high as existing non-stretchable batteries.

The KIST newly introduced stretchable gel electrolytes and stretchable packaging materials, that block air and moisture, and keep the electrolytes from leaking. The resulting stretchable battery showed a high areal capacity of 5.05 mAh/cm², superior electrochemical performance up to 50% strain under repeated (up to 500) stretch-release cycles and long-term stability of 95.7% after 100 cycles in air conditions.

Dr. Jeong Gon Son at KIST said, "The stretchable lithium-ion battery developed through this research is expected to present a new paradigm in term of stretchable energy storage systems for the further development of wearable and body-implantable electronic devices."

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The research, backed by Korea's Ministry of Science and ICT, was conducted as one of Institutional Research Program of the Korea Institute of Science and Technology, and also as a key researcher support project of the National Research Foundation of Korea. A journal article explaining the results of this research was published in the latest issue of *ACS Nano*, an international journal on nanoscience (IF: 13.903).

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https://www.eurekalert.org/pub_releases/2020-04/nrco-kds042920.php

ज्ञान प्रसार एवम् विस्तार
के 50 वर्ष

Shortage of coronavirus test kits?

No problem, new research shows the way

India's fight against Covid-19 outbreak is hampered due to shortage of testing kits. However, new findings by researchers in the US bring good news for India's fight against coronavirus.

By Prabhas K Dutta

Highlights

- New research may reduce India's dependence on Chinese testing kits
- India faces shortage of swab transport and Covid-19 diagnosis kits
- Researchers find saliva samples better, no need for RNA extraction kits

New Delhi: India is now 15th worst-affected country in terms of novel coronavirus cases. The number stood at over 31,330 with close to 1,900 being fresh cases as on Wednesday morning. Around 22,630 are active cases.

The ICMR (Indian Council of Medical Research) and the government say the rate of increase in coronavirus cases has stabilised but the stable number is not small. This calls for more testing to better ascertain the scale of Covid-19 outbreak in the country.

This is where Indian government, health agencies and healthcare professionals fighting novel coronavirus pandemic in India feel constrained. There are not enough testing kits. Local production of test kits is far behind the requirement. India is dependent



A medical professional collecting swab samples from throat of a Covid-19 suspect in Mumbai earlier this month. (Photo: PTI)

on import of kits, mostly from China, to test coronavirus infection.

The rapid test kits, imported from China, were faulty and now have been withdrawn. India's sole testing method now is RT-PCR test. This is a complex test which requires swab collection sticks, storage solution, RNA extraction kits and PCR kits.

There is growing shortage of storage solution and RNA extraction kits world over. India too has this problem. Reports suggest at the current rate of testing (around 35,000 a day), India does not have enough stock of RNA extraction kits to last more than a week.

Each Covid-19 test requires one RNA extraction kit. Without RNA extraction kits, RT-PCR test cannot happen under the current testing methods.

Now, a solution has come up. A group of researchers have developed a [new testing method](#) called, "dry swabbing, extraction-free" technique.

This method does not require the special chemical solution used for storage of swab samples before these are transferred to the RNA extraction kits for separation of RNA strands. Thereafter the PCR kit conducts genetic testing for SARS-CoV-2, the coronavirus which causes Covid-19.

The "dry swabbing, extraction-free" procedure, in fact, performed better than the existing method for coronavirus testing during the experiment conducted in the US. The new method correctly detected novel coronavirus RNA in nine out of 11 samples, taken Covid-19 patients.

In comparison, the existing methods showed positive results for only eight of the 11 cases.

"Using paired mid-turbinate swabs self-collected by 11 individuals with previously established SARS-CoV-2 positivity, we performed a comparison of conventional (swab-UTM--RNA extraction--RT-qPCR) vs. simplified (direct elution from dry swab--RT-qPCR) protocols. Our results suggest that dry swabs eluted directly into a simple buffered solution (TE) can support molecular detection of SARS-CoV-2 via endpoint RT-qPCR without substantially compromising sensitivity," the [research paper](#), which is yet to be peer reviewed, said.

There is more.

Last week, researchers found that human spit samples could be the solution to shortage of long swab sticks and special chemical required for storage of samples. Researchers have found that a coronavirus-infected person's saliva works better in tests than the conventional method of swabbing from back of the throat or deep into the nose.

The researchers in the US collected both saliva and throat swab samples from hospitalised Covid-19 patients. "We found that saliva yielded greater detection sensitivity and consistency throughout the course of infection," the [research paper](#), yet to be peer reviewed, said.

What surprised the research team is that they could not detect the novel coronavirus in some of the Covid-19 patients, whose throat-swab samples had been collected for testing. The same persons were found to be carrying the novel coronavirus infection in the samples of their saliva.

The paper says, "Saliva is a promising candidate for SARS-CoV-2 diagnostics because (1) collection is minimally invasive and can reliably be self-administered and (2) saliva has exhibited comparable sensitivity to nasopharyngeal swabs in detection of other respiratory pathogens, including endemic human coronaviruses, in previous studies."

Findings of both the researches have the potential to resolve India's handicap in conducting more and more tests for novel coronavirus.

India has received praise for early and stricter lockdown but has faced criticism for its conservative testing policy, which was primarily guided by the limited number of testing kits it has had. Earlier this week, Indore - one of the big Covid-19 hotspots - reported that it had less than 800 RNA extraction kits.

India is heavily dependent on the **import** of viral transport medium kits (having storage solution) and RNA extraction kits. The ICMR expects 30 lakh RNA extraction kits and 10 lakh viral transport medium kits to arrive soon. The order were placed weeks ago.

China, South Korea and Singapore are the major suppliers of coronavirus testing kits to India. But arrival of medical supplies has been slow. New research offers a solution.

<https://www.indiatoday.in/coronavirus-outbreak/story/covid-19-india-faces-shortage-of-test-kits-new-research-may-reduce-dependence-on-china-1672365-2020-04-29>

Covid-19: व्यस्कों के मुकाबले कोरोना से जल्द स्वस्थ होते हैं बच्चे, शोध में खुलासा

हिन्दुस्तान ब्यूरो, नई दिल्ली: कोविड-19 से पूरी दुनिया प्रभावित है। बच्चे भी इससे अछूते नहीं हैं। हालांकि, शोधकर्ताओं का दावा है कि बच्चे व्यस्कों के मुकाबले कोरोना संक्रमण से जल्द ठीक होते हैं। प्रतिष्ठित मेडिकल जर्नल द लेंसेट के अध्ययन में यह सामने आया है। शोधकर्ताओं का कहना है कि कोरोना संक्रमण से बच्चे शीघ्रता से उबर रहे हैं। बच्चे महज एक या दो हफ्ते में ही स्वस्थ हु एहें।

14 बच्चों पर किया गया अध्ययन

लेंसेट के अध्ययन निष्कर्षों से लगता है कि बच्चों में कोविड-19 के कम फैलने के प्रति संवेदनशीलता कम होना है। एक बाल चिकित्सा अस्पताल में तीन महीने से कम उम्र के 14 शिशुओं को भर्ती कराया गया था। क्वारंटाइन के पहले सप्ताह के दौरान इनमें से पांच बच्चों को स्वाब परीक्षण में पॉजिटिव पाया गया। उनके भर्ती होने तक मामूली बुखार के अलावा कोरोना के लक्षण नहीं थे। उन्हें गहन देखभाल की आवश्यकता नहीं थी।

व्यस्कों के अपेक्षा तेजी से आया सुधार

चार बच्चों में न्यूरोलॉजिकल लक्षण दिखे लेकिन उनके परीक्षण नकारात्मक थे। उन्हें एसिटामिनोफेन के अलावा कोई दवा नहीं मिली। भर्ती होने के 1-3 दिन बाद उन्हें अस्पताल से छुट्टी दे दी। एक बाल रोग विशेषज्ञ ने लगातार दो सप्ताह तक उनकी निगरानी की। वहीं, जो पांच बच्चे पॉजिटिव पाए गए थे, वे उनके साथ भर्ती किए अन्य व्यस्कों के अपेक्षा तेजी से सुधार कर रहे थे। उन्हें दो सप्ताह बाद छुट्टी दे दी गई।

पूर्ववर्ती शोध भी यही कहते हैं

हालिया सभी शोध-अध्ययन इशारा करते हैं कि बच्चों पर वयस्कों की तुलना में वायरस का असर कम होता है। साथ ही लक्षण भी कम नजर आते हैं। इससे पहले भी चीन और सिंगापुर के कुल 1,065 प्रतिभागियों पर किए गए 18 अध्ययनों के मूल्यांकन के आधार पर ऐसा ही निष्कर्ष निकाला गया था।

बच्चों के जल्द स्वस्थ होने के कारण

रिसर्च के आधार पर कहा जा सकता है कि सार्स-सीओवी-2 को शरीर में पहुंचकर सक्रिय होने के लिए एंजाइम एसीआई-2 की जरूरत होती है। बच्चों के फेफड़ों में एसीआई-2 उनके नाक, मुंह, गले के मुकाबले कम होता है। इसलिए वायरस बच्चों में यहीं असर करता है। बच्चों का शरीर खुद ही वायरस से लड़ने की क्षमता (साइटोकाइन स्टॉर्म) पैदा करता रहता है। इसलिए, वयस्कों की तुलना में बच्चों की रोग प्रतिरोधक क्षमता, बेहतर होती है। ब्रिटेन की साउथ हैम्पटन यूनिवर्सिटी में बाल रोग के विशेषज्ञ ग्राहम रॉबर्ट्स के अनुसार कोविड-19 बच्चों के फेफड़ों में न जाकर ऊपरी हिस्सों यानी नाक, मुंह, गले तक ही सीमित रहता है।

<https://www.livehindustan.com/lifestyle/story-covid-19-research-reveals-that-children-are-recovering-fast-from-coronavirus-compared-to-adults-3183173.html>