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DRDO develops sanitisation enclosures and face shields to save primarily healthcare professionals from COVID-19

Posted On: 04 APR 2020 6:29PM by PIB Delhi

In the ongoing efforts against COVID-19 pandemic, Defence Research and Development Organisation (DRDO) has been using scientific endeavours to develop products in an accelerated manner. The DRDO laboratories are working with industry partners for volume production.

Personnel Sanitisation Enclosure (PSE)

Vehicle Research Development Establishment (VRDE), Ahmednagar, a DRDO Laboratory has designed full body disinfection chamber called as PSE. This walk through enclosure is designed for personnel decontamination, one person at a time. This is a portable system equipped with sanitiser and soap dispenser. The decontamination is started using a foot pedal at the entry. On entering the chamber, electrically operated pump creates a disinfectant mist of hypo sodium chloride for disinfecting. The mist spray is calibrated for an operation of 25 seconds and stops automatically indicating completion of operation. As per procedure, personnel undergoing disinfection will need to keep their eyes closed while inside the chamber.

The system consists of roof mounted and bottom tanks with a total of 700 liters capacity. Approximately 650 personnel can pass through the chamber for disinfection until the refill is required.

The system has see-through glass panels on side walls for monitoring purpose and is fitted with lights for illumination during night time operations. A separate operator cabin is provided to monitor overall operations.

The system has been manufactured with the help of M/s D H Ltd, Ghaziabad, within a time span of four days. This system can be used for disinfection of personnel at the areas of controlled ingress and egress such as entry and exit to hospitals, malls, office buildings and critical installations.

Full Face Mask (FFM)

Research Centre Imarat (RCI), Hyderabad and Terminal Ballistics Research Laboratory (TBRL), Chandigarh, have developed face protection mask for health care professionals handling



COVID-19 patients. Its light weight construction makes it convenient for comfortable wear for long duration. This design uses commonly available A4 size Over-Head Projection (OHP) film for face protection.

The holding frame is manufactured using Fused Deposition Modeling (3D printing). Polylactic Acid filament is used for 3D printing of the frame. This thermoplastic is derived from renewable resources such as corn starch or sugarcane and is biodegradable. The face mask will be mass produced using injection moulding technique for volume production.

One thousand face shields are being produced daily in TBRL and provided to Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh. Similarly 100 are produced at RCI and these have been handed over to Employees' State Insurance Corporation (ESIC), Hyderabad. A demand of 10,000 shields has been received from PGIMER and ESIC Hospitals based on successful user trials.

<https://pib.gov.in/PressReleaseDetail.aspx?PRID=1611116>



Sun, 05 April 2020

DRDO maintains anti-coronavirus tech innovations with two inventions

DRDO said that the system was manufactured with the help of Dass Hitachi Ltd in just four days

By Akhil Kadidal

Maintaining its record of innovative new technologies to combat coronavirus, the Defense Research and Development Organisation (DRDO) unveiled a full-body disinfection chamber and a full face mask for medical staff handling affected patients on Saturday.

The full body disinfection chamber, which was developed by the DRDO lab, VRDE, in Ahmednagar, is designed as a walk-through decontamination chamber.

“This is a portable system equipped with sanitizer and soap dispenser. The decontamination is started using a foot pedal at the entry. On entering the chamber, an electrically operated pump creates a disinfectant mist of hypo sodium chloride for disinfecting,” DRDO said.

The mist spray is calibrated for operation of 25 seconds and stops automatically indicating completion of operation. As per procedure, personnel undergoing disinfection will need to keep their eyes closed while inside the chamber.

The system consists of roof mounted and bottom-placed tanks with a total of 700 liters capacity. Approximately 650 personnel can pass through the chamber for disinfection until the refill is required. A separate operator cabin is provided to monitor overall operations.

DRDO said that the system was manufactured with the help of Dass Hitachi Ltd in just four days. This system can be used for disinfection of personnel at the areas of controlled ingress and egress such as entry and exit to hospitals, malls, office buildings and critical installations.

Face Mask

Meanwhile, a DRDO lab in Hyderabad and another in Chandigarh have developed a lightweight face protection mask for healthcare professionals handling COVID-19 patients.



The face mask will be mass-produced using an injection moulding technique for volume production. A demand of 10,000 units has been received from PGIMER and ESIC Hospitals.

<https://www.deccanherald.com/city/top-bengaluru-stories/drdo-maintains-anti-coronavirus-tech-innovations-with-two-inventions-821483.html>



Sun, 05 April 2020

Coronavirus in India: DRDO designs sanitisation chamber, special face mask

Vehicle Research and Development Establishment (VRDE), Ahmednagar, a DRDO laboratory has designed a full-body disinfection chamber called Personnel Sanitization Enclosure. This walkthrough enclosure is designed for personnel decontamination, one person at a time

By Manjeet Singh Negi

New Delhi: In the ongoing efforts against the coronavirus pandemic, Defence Research and Development Organisation (DRDO) has been using scientific endeavors to develop products in an accelerated manner. The DRDO laboratories are working with industry partners for volume production of special face masks and personal sanitisation chambers.

Personnel Sanitization Enclosure

Vehicle Research and Development Establishment (VRDE), Ahmednagar, a DRDO laboratory has designed a full-body disinfection chamber called Personnel Sanitization Enclosure. This walkthrough enclosure is designed for personnel decontamination, one person at a time. This is a portable system equipped with sanitizers and soap dispenser.

The decontamination is started using a foot pedal at the entry. Upon entering the chamber, an electrically operated pump creates a disinfectant mist of hypo sodium chloride for disinfecting. The mist spray is calibrated for the operation of 25 secs and stops automatically indicating the completion of the operation.

As per the procedure, personnel undergoing disinfection will need to keep their eyes closed while inside the chamber. Approximately 650 personnel can pass through the chamber for disinfection until a refill is required.

The system has seen-through glass panels on sidewalls for monitoring purposes and is fitted with lights for illumination during night time operations. A separate operator cabin is provided to monitor overall operations.

The system has been manufactured with the help of M/s Dass Hitachi Ltd, Ghaziabad, within a time span of four days. This system can be used for the disinfection of personnel in the areas of controlled ingress and egress such as entry and exit to hospitals, malls, office buildings, and critical installations.

Face Masks

RCI, Hyderabad and TBRL, Chandigarh, have developed face protection masks for health care professionals handling the Covid-19 patients. Its lightweight makes it convenient for comfortable wear for long durations. This design uses commonly available A4 size Over-Head Projection (OHP) film for face protection.

The holding frame is manufactured using Fused Deposition Modeling (3D printing). The polylactic acid filament is used for 3D printing of the frame. This thermoplastic is derived from renewable resources such as corn starch or sugarcane and is biodegradable. The face mask will be mass-produced using an injection molding technique for volume production.

A hundred face shields are being produced daily in TBRL and provided to PGIMER, Chandigarh. Similarly, 100 are produced at RCI and have been handed over to ESIC, Hyderabad.

Demand for 10,000 Nos. has been received from PGIMER and ESIC Hospitals based on the successful user trials.

<https://www.indiatoday.in/india/story/coronavirus-in-india-drdo-designs-sanitisation-chamber-special-face-mask-1663404-2020-04-05>



Sun, 05 April 2020

डीआरडीओ ने बनाए पर्सनल सैनिटाइजेशन एन्क्लोजर और फेस प्रोटेक्शन मास्क, जानें क्या है खास बात

कोविड-19 महामारी पर अंकुश लगाने के लिए चल रहे प्रयासों में, रक्षा अनुसंधान और विकास संगठन (डीआरडीओ) ने एक पूरे शरीर के आकार के बराबर सैनिटाइजेशन एन्क्लोजर और फेस प्रोटेक्शन मास्क बनाया है। फेस प्रोटेक्शन मास्क की आपूर्ति अब थोक में अस्पतालों में की जा रही है। अहमदनगर में वाहन अनुसंधान और विकास प्रतिष्ठान, डीआरडीओ प्रयोगशाला ने पूर्ण शरीर को कवर कर सकने वाला कीटाणुशोधन चेंबर डिजाइन किया है जिसे पर्सनल सैनिटाइजेशन एन्क्लोजर कहा जा सकता है।

डीआरडीओ ने कहा, “यह एन्क्लोजर एक बार में एक व्यक्ति का परिशोधन करने के लिए बनाया गया है। यह एक पोटेबल सिस्टम है जो सैनिटाइजर और सोप मशीन से लैस है।” इसमें प्रवेश करने पर एक पैडल का उपयोग करते हुए पैर का परिशोधन शुरू किया जाता है। फिर कक्ष में प्रवेश करने पर, बिजली से चलने वाले पंप कीटाणुनाश करने के लिए हाइपो सोडियम क्लोराइड की एक कीटाणुनाशक धुंध बनाता है। यह धुंध स्प्रे 25 सेकंड के ऑपरेशन के लिए कैलिब्रेट किया जाता है और फिर खुद ऑपरेशन पूरा होने का संकेत देता है।

इस प्रक्रिया के अनुसार, कीटाणुशोधन से गुजरने वाले कर्मियों को चैम्बर के अंदर रहते हुए अपनी आंखें बंद रखनी जरूरी होती है। डीआरडीओ ने कहा, “इस प्रणाली का निर्माण गाजियाबाद में डैस हिताची लिमिटेड की मदद से चार दिनों में किया गया है। इस प्रणाली का उपयोग लोगों को कीटाणुमुक्त करने के लिए किया जा सकता है, जैसे कि अस्पतालों, मालों, कार्यालय और अन्य महत्वपूर्ण जगहों के प्रवेश और निकास द्वार पर।”

इसके अलावा, हैदराबाद के रिसर्च सेंटर इमरत और चंडीगढ़ के टर्मिनल बॉलिस्टिक्स रिसर्च लेबोरेटरी (TBRL) ने कोविड -19 रोगियों को देखरेख में लगे स्वास्थ्य कर्मियों के लिए फेस प्रोटेक्शन मास्क विकसित किया है। इसका वजन कम होने के कारण इसे ज्यादा देर तक आसानी से पहना जा सकता है। इसका डिजाइन चेहरे की सुरक्षा के लिए आमतौर पर उपलब्ध अ4 आकार के ओवर-हेड प्रोजेक्शन (ओएचपी) फिल्म का उपयोग करता है। डीआरडीओ ने कहा, “होल्टिंग फ्रेम का इस्तेमाल फ्यूजन डिपोजिट मॉडलिंग (3 डी प्रिंटिंग) के जरिए किया जाता है। फ्रेम की 3 डी प्रिंटिंग के लिए पॉलीलैक्टिक एसिड फिलामेंट का इस्तेमाल किया जाता है।”

<https://www.livehindustan.com/health/story-drdo-creates-personal-sanitization-enclosure-and-face-protection-mask-3128497.html>

डीआरडीओ ने विकसित किया डिसइंफेक्शन

चैंबर, पूरा शरीर हो जाएगा कीटाणुरहित

कोरोना वायरस से लड़ने के लिए रक्षा अनुसंधान एवं विकास संगठन ने फुल बॉडी डिसइंफेक्शन चैंबर विकसित किया है।

पुणे: कोरोना वायरस का अग्रिम पंक्ति में रहकर सामना कर रहे स्वास्थ्य कर्मियों के लिए रक्षा अनुसंधान एवं विकास संगठन (Defence Research and Development Organisation) ने फुल बॉडी डिसइंफेक्शन चैंबर विकसित किया है।

आधिकारिक विज्ञप्ति के मुताबिक, महाराष्ट्र में अहमदनगर स्थित डीआरडीओ के व्हीकल रिसर्च एंड डेवलेपमेंट इस्टेब्लिशमेंट ने 'पर्सनेल सैनिटाइजेशन इंकलोजर' विकसित किया है। चलकर निकल जाने वाले इस पोर्टेबल इंकलोजर में सैनिटाइजर और सोप डिस्पेंसर लगे हैं। इसमें प्रवेश करते ही फुट पैडल के इस्तेमाल से कीटाणुरहित बनाने की प्रक्रिया शुरू हो जाती है। चैंबर में प्रवेश करते ही बिजली से चलने वाला पंप हाइपोसोडियम क्लोराइड की कीटाणुनाशक धुंध पैदा करता है।

बता दें कि यह इंकलोज 25 सैकेंड तक हाइपोसोडियम क्लोराइड स्प्रे करता है और इसके बाद अपने आप रुक जाता है। इस दौरान चैंबर में डिसइंफेक्शन की प्रक्रिया से गुजर रहे व्यक्ति को अपनी आंखें बंद रखनी होती हैं। 650 व्यक्तियों के डिसइंफेक्शन के बाद ही इस चैंबर में सैनिटाइजिंग सोल्यूशन को रिफिल करने की जरूरत होती है।

इस प्रणाली का निर्माण गाजियाबाद स्थित मैसर्स दास हिताची लिमिटेड की मदद से चार दिन में किया गया है। इसका इस्तेमाल अस्पतालों, मॉल्स, कार्यालयों और अहम प्रतिष्ठानों के प्रवेश और निकास पर व्यक्तियों को कीटाणुरहित बनाने के लिए किया जा सकता है।

इसी क्रम में हैदराबाद स्थित रिसर्च सेंटर इमारत और चंडीगढ़ स्थित टर्मिनल बेलिस्टिक्स रिसर्च लेबोरेटरी ने कोविड-19 मरीजों का इलाज कर रहे डॉक्टरों और नर्सों के लिए फेस प्रोटेक्शन मास्क विकसित किए हैं। यह काफी हल्के हैं जिसकी वजह से इन्हें लंबे समय तक पहनना आरामदायक है।

<https://www.jagran.com/news/national-fight-against-coronavirus-drdo-designs-full-body-disinfection-chamber-and-special-face-mask-20166036.html>

अमर उजाला

अब आसानी से सैनिटाइज होंगे दुर्गम

एरिया के सैन्य ऑफिस, यूनिटें

कोरोना के खतरे के मद्देनजर अब सैन्य, यूनिटों, कार्यालय और जवानों की बैरकों को आसानी से सैनिटाइज किया जा सकेगा। खासकर हाई एल्टीट्यूड एरिया में तैनात आर्मी और एयरफोर्स की वे यूनिटों व कार्यालय जहां इस वक्त सैनिटाइजेशन एक बड़ी चुनौती बनी हुई है, वहां भी अब इस काम को किया जा

सकेगा। इस काम के लिए डिफेंस रिसर्च एंड डेवलपमेंट ऑर्गेनाइजेशन (डीआरडीओ) ने खास पोर्टेबल बैकपैक सैनिटाइजेशन इक्यूपमेंट तैयार किया है। उपकरण की खास बात यह है कि इसे कहीं पर भी कमर पर लादकर आसानी से ले जाया जा सकता है। यदि इस उपकरण को कमर पर लादकर काम नहीं करना है तो डीआरडीओ ने एक और विद ट्रॉली सैनिटाइजेशन उपकरण भी तैयार किया है, जिसे आसानी से कहीं भी ले जाया जा सकता है।

अफसरों का कहना है कि इस उपकरण का इस्तेमाल अस्पतालों, मेट्रो, बसों समेत उन दुर्गम और तंग इलाकों में किया जा सकता है, जहां बड़े सैनिटाइजर वाहनों का जाना संभव नहीं है। इस वक्त सैन्य क्षेत्रों में बड़े सैनिटाइजर वाहनों से इलाके को सैनिटाइज करने का काम चल रहा है, लेकिन सेना को हाई एल्टीट्यूड एरिया में इस काम को लेकर खासी परेशानी का सामना करना पड़ रहा है। इस एरिया में जवानों की बैरकों को यूनिटों और कार्यालयों को सैनिटाइज करने के लिए यह उपकरण कारगर साबित होंगे। एयरफोर्स और नेवी के लिए भी यह बड़े मददगार बनेंगे। दोनों तरह के ये सैनिटाइजेशन उपकरण दिल्ली पुलिस ने भी डीआरडीओ से लिए हैं।

ये है उपकरण की खासियत

- द सेंटर फॉर फायर एक्सप्लोसिव इनवायरमेंट सेफ्टी की मदद से दो तरह के बैकपैक व विद ट्रॉली सैनिटाइजेशन उपकरण तैयार किए गए।
- बैकपैक उपकरण इनकॉरपोरेट्स लो प्रेशर ट्विन फ्लूड टेक्नोलॉजी (एयर एंड डिसइनफेक्टेंट लिक्विड) पर आधारित है।
- यह बैकपैक उपकरण 300 वर्ग मीटर एरिया को एक बार में सैनिटाइज कर सकता है।
- दूसरा हायर कैपेसिटी विद ट्रॉली वाला उपकरण सिंगल फ्लूड टेक्नोलॉजी पर आधारित है।
- विद ट्रॉली उपकरण की टैंक कैपेसिटी 50 लीटर की होगी और 15 मीटर दूरी से यह 3000 वर्ग मीटर सैनिटाइज कर सकेगा

सैनिटाइजर, मास्क भी बना रहा डीआरडीओ

कोरोना वायरस के चलते डीआरडीओ इन दिनों सैनिटाइजर व मास्क भी तैयार कर रहा है। सैनिटाइजर की सप्लाई विभिन्न फोर्सों के साथ-साथ दिल्ली पुलिस को भी की गई है। अभी तक डीआरडीओ की ओर से 4000 लीटर सैनिटाइजर विभिन्न आर्म्ड फोर्सों को, 1500 लीटर मिनिस्ट्री ऑफ डिफेंस, 300 लीटर संसद भवन के लिए और 500 लीटर अन्य सुरक्षा एजेंसियों को उपलब्ध करवाया जा चुका है। इस वक्त डीआरडीओ रोजाना 20 से 30 हजार लीटर सैनिटाइजर का उत्पादन कर रहा है। इसके अलावा रोजाना 10 हजार एन-99 मास्क भी तैयार किए जा रहे हैं। अभी तक 20,000 थ्री लेयर मास्क डीआरडीओ की ओर से दिल्ली पुलिस को उपलब्ध करवाए जा चुके हैं। जबकि एन-95 मास्क अभी बनाए जा रहे हैं।

<https://www.amarujala.com/haryana/panchkula/drdo-designed-portable-backpack-sanitization-equipment-panchkula-news-pkl3715243170>

COVID-19 | DRDO comes up with more products to tackle coronavirus

The Defence Research & Development Organisation (DRDO) has announced a few more products made by its scientists with indigenous technologies to combat coronavirus pandemic.

The Centre for Fire Explosive & Environment Safety (CFEES), Delhi, developed two configurations of sanitising equipment which are spin-offs from technologies developed for fire suppression applications. First is portable sanitisation equipment for spraying decontamination solution consisting of 1% Hypochlorite (HYPO) solution for sanitisation of suspected area.

The backpack generates very fine mist and is capable of disinfecting an area up to 300 metres whereas the trolley mounted large area sanitisation equipment can spray the disinfectant liquid up to 3,000 metres.

It has a tank capacity of 50 litres and has a throw distance of 12-15 metres. The Delhi Police has been supplied with these machines and the same can be supplied to others too, informed an official spokesperson.

Ahmednagar-based DRDO laboratory, VRDE, has designed full body disinfection chamber called as 'Personnel Sanitisation Enclosure' where a walk through enclosure is designed for personnel decontamination, one person at a time.

This is a portable system equipped with sanitiser and soap dispenser. On entering the chamber, electrically operated pump creates a disinfectant mist of hypo sodium chlorite. The mist spray is calibrated for an operation of 25 seconds and stops automatically indicating completion of operation but the person has to keep eyes closed inside the chamber.

The system consists of roof mounted and bottom tanks with a total of 700 litres capacity. About 650 personnel can pass through the chamber for disinfection until the refill is required. It can be seen through glass panels on side walls for monitoring purpose and is fitted with lights for illumination during nights with a an operator cabin to monitor. It has been manufactured with the help of M/s Dass Hitachi Ltd, Ghaziabad, within four days.

<https://www.thehindu.com/news/cities/Hyderabad/coronavirus-drdo-comes-up-with-more-products-to-tackle-covid-19/article31261371.ece>



Portable sanitization enclosure to be designed for Delhi residents

The system consists of roof mounted and bottom tanks with a total of 700 liters capacity. Approximately 650 personnel can pass through the chamber for disinfection until the refill is required

New Delhi: In a bid to contain the spread of coronavirus, the Defence Research and Development Organisation (DRDO) has designed a personnel sanitization enclosure that can be used for disinfection of personnel at entry to hospitals, malls, office buildings and critical installations.

This walk through enclosure is designed for personnel decontamination, one person at a time. This is a portable system equipped with sanitiser and soap dispenser. The decontamination is started using a foot pedal at the entry.

On entering the chamber, electrically operated pump creates a disinfectant mist of hypo sodium chloride for disinfecting. The mist spray is calibrated for an operation of 25 seconds and stops automatically indicating completion of operation.



The system consists of roof mounted and bottom tanks with a total of 700 liters capacity. Approximately 650 personnel can pass through the chamber for disinfection until the refill is required.

A separate operator cabin is provided to monitor overall operations.

This system can be used for disinfection of personnel at the areas of controlled ingress and egress such as entry and exit to hospitals, malls, office buildings and critical installations. The DRDO has also developed a face protection mask for healthcare professionals handling COVID-19 patients. Its light weight construction makes it convenient for comfortable wear for long duration. This design uses commonly available A4 size Over-Head Projection (OHP) film for face protection.

The total positive cases of COVID-19 in India stand at 3,072, according to the Ministry of Health and Family Welfare.

<https://www.timesnownews.com/mirror-now/in-focus/article/portable-sanitization-enclosure-to-be-designed-for-delhi-residents/573958>

DRDO's missile Scientists churn out products to fight COVID-19

Some of the best brains behind a number of strategic and tactical missile missions at APJ Abdul Kalam Missile Complex in Hyderabad are now burning the midnight oil to help medical fraternity fight the coronavirus

By Anantha Krishnan M

Bengaluru: Necessity is the mother of invention. True to this adage, Indian missile Scientists have tweaked their trajectory to hit hitherto unknown targets to neutralise COVID-19 threat.

In short, some of the best brains behind a number of strategic and tactical missile missions at APJ Abdul Kalam Missile Complex in Hyderabad are now burning the midnight oil to help medical fraternity fight the coronavirus.

Amid all the restrictions around, a select group of scientists from Research Centre Imarat (RCI), a top arm of Defence Research and Development Organisation (DRDO) in the Missile Complex, are developing a number of healthcare products on a war-footing.

Seeing the urgency and not wanting to wait for any formal approvals, some scientists have even spent money from their own pockets before the government relaxed rules and gave powers to the lab directors to utilise required funds.

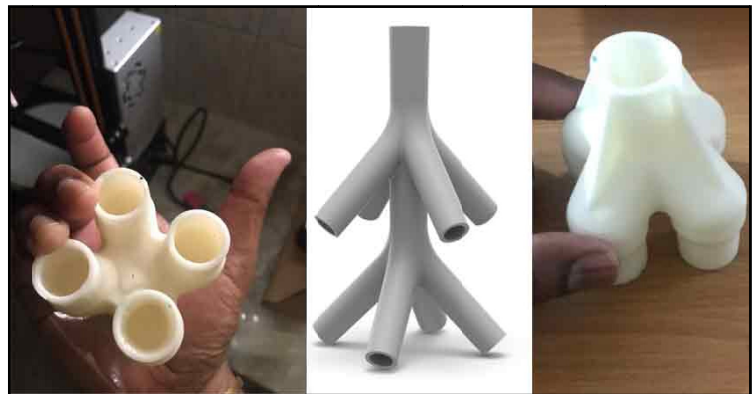
Interestingly, many of the technology used to develop these products to fight COVID-19 are borrowed from systems and sub-systems on board many Indian missiles.

Among the products that have passed the prototype testing stages and already with industrial partners for mass production are: a full control and actuators) and high response solenoid valves (use for missile control) for ventilator pumps to name a few.

Along with local industry work is in full swing to develop multiplexed ventilation system (can be connected to 2-4 patients at a time), multiplexing adapter for existing ventilators with/without any flow control for each channel and multiplexing adapter for existing ventilators with computer-based automated and regulated flow control for each channel.

Team RCI's contribution is in addition to the bio suits and ventilators being developed by various DRDO labs to combat the virus.

Sources in the Missile Complex confirm to Onmanorama that DRDO headquarters has stationed its Director General (Production Coordination & Services Interaction) GN Rao in Hyderabad to monitor the progress of the design and mass production of these products.



They say DRDO Chairman Dr G Satheesh Reddy has been interacting with the Scientists and industry partners constantly over video conferencing three to four times a day monitoring the progress of the design and mass production of these products.

Vibrant team

The young RCI team consists of scientists from mechanical, electronics and computer science streams working on various missile systems. Their areas of expertise are in electromechanical and hydraulic actuation systems, missile electronic packaging and dynamic testing, imaging sensor and processing, on board embedded computers and real-time software development.

Three core and five supporting teams have been logging close to 20 hours a day in the last two weeks. Most of the team members average around 35 years.

The core team consists of G Sreedhar Babu, Harish Akella, Maruti Sairam with the logistics support from Dr Rahul Dixit, Dr P Anil Kumar, RJK Chari, Harminder Singh and Kuldeep.

Their expertise range from electro mechanical actuation systems, imaging infrared seekers, missile launch console development, missile software development, flight avionics simulation and testing, high precision and response valves, electrical integration of missile systems, heat exchangers and marine systems.

These youngsters (with 10 to 20 years of experience) have worked with missions, including A-SAT, exo\endo-air defence missiles, UAVs, target missiles, Nag, Helina, B05, K4, precision guided munitions, anti-radiation missile and oating test range.

Sources say that Scientists have used most of the proven missile systems to suit the urgent timelines with minimal tweaking.

“The visor-type face mask is the best example of quick design and development within three days. Various design options were explored and the prototypes were 3D printed by our production partners and given to a team of doctors for necessary inputs and suggestions. The nal product was released after accommodating their suggestions,” says a scientist.

For multiplexing ventilation system, the design was completed in a day with 14 different options being made available to the users. The prototypes were evaluated by a team from Apollo DRDO Hospital and ESICH.

Big Challenges

The RCI team said that everyone was motivated to design and deliver products despite several challenges owing to COVID-19 restrictions, including the lockdown.

“All of us had the required knowledge and expertise to do the job. There were many issues to be solved as we are using the existing designs for a completely different purpose. Lot of verification and validation were to be done as these were now being part of a medical device. In addition we had to face technical and logistic challenges. The Management Service Division, Procurement wing, office of RCI director (Narayana Murthy) and ofce of Director General, Missiles and Strategic Systems (MSR Prasad) have been backing our efforts non-stop,” says another scientist.

The team sought special permissions from the Ministry of Defence to fast-track procurement process, following which the purchase order was placed within a day for prototype development and die-making. In the normal process this would have taken three weeks.



“Our production partners supported to their maximum extent possible without even asking for the confirmed production order or number of units required. They spent lakhs of rupees for design prototyping, die making and evaluation,” says a scientist.

The Scientists said that many hospitals are not sparing any options and are even stockpiling washbasin drain pipes to use as ventilator pipes in a worst case scenario.

“We went to discuss ventilator development and carried 10 prototypes of masks. The medical staffs were so impressed with it and they wanted us to work on multiplexing ventilators for the forecasted requirement. We had to return empty handed as all the prototypes were grabbed by them,” adds the scientist.

Help Pours in

Most of the doctors were overwhelmed to deal with missile scientists, a deviation from their normal interactions, to find solutions to an impending threat.

“We could sense the urgency of the innovation and the healthcare professionals are eagerly looking for the gadgets to do their job safely and efficiently,” says a scientist.

Timely help came from Dr Balakrishna of Apollo DRDO Hospital who provided ventilator and lung simulator to see the efficacy of the prototype assembly and 3D printed fittings. Similarly, they said that Dr Srinivas, dean of ESI Medical College, too offered equipment for integrations trials.

Various industrial partners associated with RCI and DRDO in Hyderabad will begin the mass production. The frames will be produced by a Hyderabad-based company iMake. The ventilator multiplexing systems are still under development phase and hunt for a production partner for mass production is on.

In an email response to Onmanorama’s queries Kodeboyina Sudhir of iMake, who is making visor-type masks (face shield) for healthcare professionals, said they have already proven their expertise in aviation electronic parts, tire patterns, prototypes of missile components and miniature/scale models.

He said the firm has already received the final design from RCI after testing 14 versions different hospitals. “The mould design has been finalised and the milling is in progress. Through the injection mould, we will be able to make 5000 units per day, starting April 6,” he adds.

A top DRDO official overseeing the mission says that the entire RCI team was chosen by DRDO Chairman Dr Satheesh Reddy based on his

The RCI team is quick to share the credit with doctors and medical attendants who gave rare insights into the immediate needs.

(The writer is an independent aerospace and defence journalist, who blogs at Tarmak007 and tweets writetake.)

<https://english.manoramaonline.com/news/nation/2020/04/04/drdo-missile-scientists-products-covid19-coronavirus.html>

THE TIMES OF INDIA

Sun, 05 April 2020

DRDO develops walk-through fumigation unit

New Delhi: The DRDO on Saturday said it has developed a portable full-body decontamination chamber or personnel sanitisation enclosure (PSE), which can be used in hospitals, office buildings and other critical installations.

"The enclosure, equipped with sanitiser and soap dispenser, is a walk-through enclosure designed to disinfect one person at a time. Designed by DRDO lab, Vehicle Research Development Establishment, at Ahmednagar, the PSE has been manufactured with the help of M/s D H Ltd, Ghaziabad within four days," said an official.

"Upon entry, electrically-operated pumps create a disinfectant mist of hypo sodium chloride. The mist spray is calibrated for an operation of 25 seconds," he said.

Two other DRDO labs have also developed light-weight full face protection masks for health care professionals.

<https://timesofindia.indiatimes.com/india/drdo-develops-walk-through-fumigation-unit/articleshow/74988601.cms>



Sun, 05 April 2020

DRDO laboratory designs full body disinfection chamber

Vehicle Research Development Establishment, VRDE Ahmednagar which is a DRDO Laboratory has designed full body disinfection chamber called as PSE. This walk through enclosure is designed for personnel decontamination. This is a portable system equipped with sanitiser and soap dispenser. The decontamination starts using a foot pedal at the entry. On entering the chamber, electrically operated pump creates a disinfectant mist of hypo sodium chloride for disinfecting. The mist spray is calibrated for an operation of 25 seconds and stops automatically indicating completion of operation. The system consists of roof mounted and bottom tanks with a total of 700 liters capacity. Approximately 650 personnel can pass through the chamber for disinfection until the refill is required. The system has a see-through glass panels on side walls for monitoring and is fitted with lights for illumination during night time operations. A separate operator cabin is provided to monitor overall operations.

The system has been manufactured with the help of D H Ltd, Ghaziabad, within four days. This system can be used for disinfection of personnel at the areas of controlled ingress and egress such as entry and exit to hospitals, malls, office buildings and critical installations.

Research Centre Imarat or RCI Hyderabad and Terminal Ballistics Research Laboratory, TBRL, Chandigarh, have developed face protection mask for health care professionals handling COVID-19 patients. Its light weight construction makes it convenient for comfortable wear for long duration. This design uses commonly available A4 size Over-Head Projection (OHP) film for face protection.

One thousand face shields are being produced daily in TBRL and provided to Postgraduate Institute of Medical Education and Research Chandigarh. Similarly 100 are produced at RCI and these have been handed over to Employees' State Insurance Corporation, ESIC, Hyderabad.

<http://newsonair.com/Main-News-Details.aspx?id=384720>



Sun, 05 April 2020

COVID-19 outbreak: DRDO develops disinfection chamber, face mask

The Vehicle Research and Development Establishment, a DRDO laboratory at Ahmednagar in Maharashtra, has developed a 'Personnel Sanitization Enclosure'

Pune: A unit of the Defence Research and Development Organization (DRDO) has designed a full-body disinfection chamber for healthcare workers who are in the forefront of battle against coronavirus, it said on Saturday.

The Vehicle Research and Development Establishment, a DRDO laboratory at Ahmednagar in Maharashtra, has developed a 'Personnel Sanitization Enclosure', an official release said here.

The walk-through enclosure is a portable system equipped with sanitizer and soap dispenser.

"The decontamination is started using a foot pedal at the entry. On entering the chamber, an electrically operated pump creates a disinfectant mist of hyposodium chloride for disinfecting," the DRDO release said.

"The mist spray is calibrated for the operation of 25 seconds and stops automatically. Personnel undergoing disinfection will need to keep their eyes closed while inside the chamber," it said.

Some 650 personnel can pass through the chamber for disinfection until a refill of sanitizing solution is needed.

The system was manufactured with the help of M/s Dass Hitachi Ltd, Ghaziabad, within four days, and can be used for disinfection of personnel at entry and exit to hospitals, malls, office buildings and critical installations, the DRDO release said.

The Research Centre Imarat (RCI), Hyderabad and Terminal Ballistics Research Laboratory, Chandigarh, have developed a face protection mask for doctors and nurses who are treating COVID-19 patients, it said.

"Its lightweight construction makes it convenient for comfortable wear for a long duration," the release added.

<https://www.newindianexpress.com/nation/2020/apr/04/covid-19-outbreak-drdo-develops-disinfection-chamber-face-mask-2125825.html>



Sun, 05 April 2020

Ventilators, masks & PPE suits: Here's how DRDO is taking on Covid-19

By Aman Rawat

- *DRDO is special adhesive to make full-body suits at low cost at a scalable level*
- *DRDO is also addressing the shortage of ventilators*
- *It is also manufacturing masks and sanitisers*

In the wake of the Covid-19, tech startups have taken the charge and are helping the healthcare ecosystem come with unique propositions to solve medical and safety challenges. Joining these forces against Covid-19, state-owned Defence Research and Development Organisation (DRDO) has come with a slew of measures that can come handy in these situations.

To start with, the DRDO is addressing the shortage of personal protective equipment by using a special adhesive which finds its application in submarines. Scientists are testing this adhesive to make full-body suits at low cost at a scalable level. This adhesive can be used as a special coating that can strengthen high-performance fabrics. DRDO uses this adhesive for making suits of paratroopers.

DRDO has shared this technology with two companies which are now looking to manufacture around 15K to 20K suits every week. The first batch of these suits is expected to be completed shortly, according to a report by ET.

Scaling-Up Manufacturing Of Safety Gear

Besides the support in manufacturing personal protection equipment (PPE) or bodysuits, DRDO is also manufacturing five-layered N 99 face masks. These masks are being prepared at the Gwalior-based Defence Research and Development Establishment. As of now, it is manufacturing around 200K masks every week.

Further, DRDO has also come up with a reusable face shield to protect medical professionals from getting infected to coronavirus. These masks are produced at an in-house 3D printing facility used to make these masks and shields.

Additionally, the DRDO has also taken up the responsibility to scale up the manufacturing of hand sanitisers. The organisation is producing them at multiple laboratories across the country. These sanitisers are provided to government agencies and police departments.

The defence organisation is also addressing the shortage of ventilators to bolster the healthcare system of the country. DRDO chairman G Sateesh Reddy said that multi-patient ventilation kits have been developed and successfully tested that would enable the use of a single ventilator for four to eight patients in case of an emergency.

Reddy also noted that most of these technologies are developed at a low cost so that their mass-scale production can take off easily. He added that scientists throughout the country have been tasked with developing and sharing technologies at zero cost with the private sector to mass-produce critical items identified by the government, with solutions being provided overnight and personnel working overtime to tackle stumbling blocks.

Overall, the DRDO is supplying more than six items which are in high demand across the country amid the coronavirus outbreak. Reddy said that the organisation is working on to roll out more products in the coming days. For the same, the organization is in continuous touch with the private sector as well. “The scientific fraternity has felt the need of the hour and wants to use existing skills to create spin-off technologies. We are coming out with quick solutions and products. Scientists have been working day and night to rise to the occasion,” Reddy added.

<https://inc42.com/buzz/ventilators-masks-ppe-suits-heres-how-drdo-is-taking-on-covid-19/>



Sun, 05 April 2020

India's Brahmos-ER trial just got postponed. What's expected from new BrahMos?

India's DRDO called off a crucial missile test recently due to the outbreak of the Chinese Virus in the country which was followed by lock down announced by the government and closing of all International flights which prevented the participation of some critically important observers from Russia for crucial BrahMos test flight which now stands canceled.

India which is now a part of the elite Missile Technology Control Regime (MTCR) carried out internal software upgradation to the Indo-Russian developed BrahMos missile which removed its 290km range limiter and also successfully tested it's up to 400km range recently, but desired longer version of the missile remains to be done and it was reported that now canceled test was actually of the new BrahMos with Extended range which has been designated as "BrahMos-ER".



CEO of BrahMos Aerospace, Sudhir Kumar Mishra has confirmed to media that the BrahMos-ER is ready which will have a range of 500km but a meager extended range of 100km will also come with better missile speed as the internal propellant carrying capability has been increased along with tweaked scram-jet air-breathing jet engine. which can now officially be able to fly over Mach 3 and close to Mach 4.

The original plan after India's entry into the MTCR regime was to increase its range from 290 km to 800 km like seen with Russian developed Oniks-M supersonic cruise missile upon which BrahMos was originally based and as interim upgrade 400km range was tested before work began on the development of BrahMos-ER with a range of 800km.

The first test of the BrahMos missile, which is operational with the Indian Navy and Army, was conducted in 2001, since then it has added additional capabilities like steep 90-degree vertical deep dive version for mountain warfare and evasive 'S' maneuver against highly defended strike targets but the most of the other technology has remained the same for last two decades.

idrw.org has been told that BrahMos had a stellar run as psychological weapon platform which couldn't be defeated by any modern air defense system and Indian military planners want to keep it that way even though many countries over the years have been working to create weapons which can take down supersonic cruise missiles like BrahMos not many have been able to demonstrate it.

With increased speed from Mach 2.8 to near Mach 3.5-4, Indian military planners want to ensure that Brahmos-ER remains unchallenged in the coming decades and remains undefeated against any air defense systems our adversaries might have been developing. idrw.org has been told that the development of two variants of Brahmos-ER with a range from 500km to 800km can't be ruled out which will have a speed of Mach 2.5 or near Mach 4 depending on the strike target.

BrahMos Aerospace is planning to work on the development of BrahMos-NG which will be a lighter and smaller version of the current Brahmos-ER with a similar range between 500-800km being developed specifically for the Indian Air Force which might see further orders from the Indian Navy and Indian Army also. India's joint venture plans to develop a BrahMos-2K which was supposed to be a Hypersonic weapon system with speeds in Mach 5-7 has been delayed due to lack of willingness from Russia, which could be one of the reasons why India instead planned to increase range of the current BrahMos close to Mach 4.

(Note: Article cannot be reproduced without written permission of idrw.org in any form even for YouTube Videos to avoid Copy right strikes)

<https://idrw.org/indias-brahmos-er-trial-just-got-postponed-whats-expected-from-new-brahmos/#more-224251>

Business Standard

Sun, 05 April 2020

Indian Army boost strength of medical team at Delhi's Narela quarantine centre

New Delhi: The Indian Army is boosting the strength of the medical team at Delhi's Narela quarantine centre to four doctors and eight nursing staff members, Army sources said on Saturday.

Earlier there were two doctors and two nursing staff members to assist Delhi Government.

Dedicated COVID-19 facilities including High Dependency Units and ICUs are being prepared in approximately 51 Armed Forces hospitals across the country, according to an official statement by the Indian Army on Friday.

Six quarantine facilities in Mumbai, Jaisalmer, Jodhpur, Hindon, Manesar, and Chennai are being run by Armed Forces amid coronavirus outbreak.

The statement added that all armed forces units are coordinating with local civilian authorities to enhance COVID-19 preparedness levels.

The total positive cases of COVID-19 in India stand at 3072.

(This story has not been edited by Business Standard staff and is auto-generated from a syndicated feed.)

https://www.business-standard.com/article/news-ani/indian-army-boost-strength-of-medical-team-at-delhi-s-narela-quarantine-centre-120040401130_1.html

कोरोना वायरस से जंग में सेना ने संभाला मोर्चा, पड़ोसी देशों की सहायता के लिए भी तैयार 'भारत के लाल'

कोरोना से जंग में भारतीय सेना भी बड़े पैमाने पर तैयारी कर रही है। उधमपुर स्थित उत्तरी कमान मुख्यालय समेत पांचों सैन्य कमान मुख्यालयों में कोरोना वायरस टेस्टिंग लैब स्थापित कर दी गई हैं। वहीं, आर्म्ड फोर्सेज मेडिकल सर्विस ने अपने सभी केंद्रों को नागरिक प्रशासन के सहयोग में लगा दिया है। राहत सामग्री पहुंचाने में भी सहयोग किया जा रहा है।

आर्म्ड फोर्सेज ने देशभर में छह क्वारंटीन सुविधा केंद्र भी शुरू कर दिए हैं। यह केंद्र मुंबई, जैसलमेर, मानेसर, चेन्नई, हिंडन और जोधपुर में हैं। इनमें 1737 लोगों को रखा गया है, जिनमें से 403 को जल्द डिस्चार्ज किया जाएगा। मानेसर और हिंडन से तीन कोरोना पॉजिटिव मरीजों को बेहतर उपचार के लिए दिल्ली के सफदरगंज अस्पताल रेफर किया गया है।

सेना की ओर से जारी बयान में कहा गया है कि जरूरत पड़ने पर 15 और केंद्रों को शुरू किया जाएगा। देशभर के 51 सैन्य अस्पतालों में एचडीयू और आईसीयू भी तैयार कर दिए गए हैं। इनमें कुछ कोलकाता, विशाखापत्तनम, कोचि, हैदराबाद के डुंडीगल, बेंगलुरु, कानपुर, जैसलमेर, जोरहट और गोरखपुर में हैं।

देशभर की जरूरत को देखते हुए पांच सैन्य अस्पतालों कमांड अस्पताल (नार्दन कमांड) उधमपुर, दिल्ली कैंट सैन्य अस्पताल (रिसर्च एंड रेफरल), एयरफोर्स कमांड अस्पताल बेंगलूरु, एयरफोर्स मेडिकल कॉलेज पुणे, कमांड अस्पताल (सेंट्रल कमांड) लखनऊ की वायरल टेस्ट लैब भी कोरोना संक्रमण की जांच खोल दी हैं। छह अन्य अस्पतालों में जरूरी उपकरण जल्द स्थापित किए जा रहे हैं।

पड़ोसी देश की सहायता के लिए भी तैयार

कोरोना वायरस के खिलाफ जंग को देखते हुए वायुसेना के विशेष विमान भी लोगों की सुविधा और मेडिकल सप्लाई में लगाए गए हैं। सेना के सी-17 हेवी लिफ्टर जहाज में क्रू, मेडिकल टीम और सहायक स्टाफ सहित 15 टन मेडिकल सप्लाई चीन भेजी गई। इसके अलावा सी-17 से ही ईरान में जाकर वहां फंसे 58 भारतीयों जिनमें 31 महिलाएं और दो बच्चे शामिल हैं, को भी लाया गया।

वायुसेना के विमानों को जरूरी वस्तुओं, दवा और मेडिकल उपकरणों के पहुंचाने के लिए लगाया गया है। इस दौरान 60 टन सामग्री को देश के विभिन्न भागों में पहुंचाया है। 28 फिक्स विंग और 21 हेलीकॉप्टर को देशभर में स्टैंडबाई मोड पर रखा गया है। इसके अलावा छह नौ-सैनिक जहाज और पांच मेडिकल टीम भी पड़ोसी देशों की मदद के लिए तैयार हैं। इन्हें मालदीव, श्रीलंका, बांग्लादेश, नेपाल, भूटान और अफगानिस्तान में तैनाती के लिए तैयार किया गया है।

<https://www.amarujala.com/jammu/coronavirus-in-jammu-kashmir-j-k-news-in-hindi-indian-army-ready-to-defeat-coronavirus?pageId=1>

Indian Navy's southern command trains non-medical staff to support fight against Covid-19

Southern Naval Command has prepared a Training Capsule for Battle Field Nursing Assistant (BFNA) to train non-medical staff who will work as force multipliers

Mumbai: The COVID core working group of the Indian Navy's Southern Naval Command has prepared a Training Capsule for Battle Field Nursing Assistant (BFNA) to train non-medical personnel who will work as force multipliers in times of emergencies. The core team consisting of Command Medical Officer, Commanding Officers of INS Venduruthy & INHS Sanjivani and Command Training Officer have used the BFNA concept and developed a small capsule.

Training to Fight COVID-19

Basic concepts of hand hygiene, donning and doffing of PPE, the concept of biomedical waste management and carriage of casualty have been covered simply for the non-medical personnel. Simple strategies for infection prevention have also been dealt with in this course.

The training is actively being carried out at all units of Southern Naval Command as an attempt to train non-medical personnel who will work as force multipliers in times of emergencies. A total number of 333 personnel have been trained to date in Southern Naval Command.

Indian Navy's Guideline

Amid the rising number of Coronavirus cases in the country, the India Navy has issued guidelines regarding the same and is monitoring the health of its officers and sailors.

"Navy warships are carrying out necessary operations. The health of officers/sailors is being monitored. Navy has issued guidelines for manning in all commands and units in accordance with government guidelines while ensuring necessary operational functionality is maintained," Indian Navy sources said as quoted by new agency.

Coronavirus Crisis

The total number of positive cases in India has soared to 3072 while 75 people have died due to the infection. 213 people have either recovered or discharged. The country entered its eleventh day of the three-week shutdown aimed to curb the spread of the novel Coronavirus.

<https://www.republicworld.com/india-news/general-news/southern-command-trains-non-medical-staff-to-fight-against-covid-19.html>

Business Standard

MoD: Military to deploy more units to battle Covid-19

Testing facilities, 15,000 beds, military schools to made available if needed, says defence ministry

By Ajai Shukla

With the national effort against the coronavirus disease (Covid-19) pandemic being increasingly enunciated in the rhetoric of a "war", the ministry of defence (MoD) announced on Friday the deployment of additional military medical and logistics resources to aid government health authorities.

The MoD said that, in addition to six quarantine facilities the armed forces have already established at Mumbai, Jaisalmer, Jodhpur, Hindon, Manesar and Chennai, the military will make

available “high dependency unit” and “intensive care unit” beds in 51 armed forces hospitals across the country.

“Some of these facilities are located at Kolkata, Visakhapatnam, Kochi, Dundigal near Hyderabad, Bengaluru, Kanpur, Jaisalmer, Jorhat and Gorakhpur,” said a MoD release on Friday.

In addition, 15 other facilities are being kept ready as standby for use, if required,” stated the defence ministry on Friday. Together, these have beds for about 15,000 Covid-19 patients.

Army chief, General M M Naravane, has offered more than 8,500 doctors and support staff to assist the anti-Corvid-19 effort.

As Coronavirus testing picks up momentum, five viral testing labs at Armed Forces hospitals, which are equipped to carry out Covid-19 testing, have been made part of the national grid. “These include Army Hospital (Research & Referral), Delhi Cantt; Air Force Command Hospital, Bangalore; Armed Forces Medical College, Pune; Command Hospital, Lucknow and Command Hospital, Udhampur. Six more hospitals are being equipped shortly with the resources to begin Covid-19 testing,” stated the ministry.

The armed forces have already handled 1,737 patients at the quarantine centres already functioning. Of these, 403 have been released, while three positive Covid-19 cases – two from Hindan and one from Manesar – were referred to Safdarjung Hospital in New Delhi for further treatment.

Besides the military’s primary function to safeguard India’s territorial integrity, it also has a secondary role “in aid to the civil authority.” Besides restoring law and order and civilian control in flashpoints like Jammu & Kashmir, this requires the military to assist in controlling natural disasters and pandemics, when called upon by the government.

The military is totally prepared to stand up to the demands made by government and the people,” stated Chief of Defence Staff, General Bipin Rawat, to the media.

Rawat has also offered to allow the use of military school premises – currently closed due to the lockdown, and subsequently the summer vacation – as quarantine centres for persons who have been exposed to the Covid-19 virus.

The Indian Air Force (IAF) has mobilized its aircraft fleet for transporting essential supplies, medicines and medical equipment. “So far, approximately 60 tonnes of stores have been airlifted to various parts of the country. 28 fixed wing aircraft and 21 helicopters are on standby at various locations across the country,” said the defence ministry.

Meanwhile, special IAF flights have evacuated Indian citizens and transported over 25 tonnes of medical supplies. “A C-17 Globemaster III comprising of crew, medical team and support staff has carried 15 tonnes of medical supplies to China and airlifted 125 persons, comprising Indian nationals and few citizens from friendly countries on its return,” said the ministry.

An IAF C-17 Globemaster III has also flown to Iran and brought back 58 stranded Indians, along with 529 samples for Covid-19 testing.

Continuing India’s tradition of assisting small Indian Ocean countries, a C-130J Super Hercules aircraft flew to the Maldives with 6.2 tonnes of medicines. “An Army Medical Corps team consisted of five doctors, two nursing officers and seven paramedics was deployed in Maldives for capacity building measures and assistance and in setting up their own testing, treatment and quarantine facilities between March 13-21,” said the defence ministry.

The navy has readied six warships for assisting littoral neighbours. In addition, five naval medical teams are on standby for deployment in Maldives, Sri Lanka, Bangladesh, Nepal, Bhutan and Afghanistan.

Meanwhile, the Defence R&D Organisation (DRDO) has developed a five-layered nanotechnology face mask (called N99) and is ramping up per day production to 20,000 masks. DRDO is also engaged in modifying ventilators so that one machine can support four patients at the same time.

https://www.business-standard.com/article/current-affairs/as-india-steps-up-war-against-covid-19-military-to-deploy-more-resources-120040300820_1.html



Sun, 05 April 2020

‘India’s call for south asian response to combat Covid-19 countering China’s attempts to change narrative’

India’s offer of a regional South Asian response to tackle the coronavirus pandemic has been an effective counter to China’s attempts to change the narrative on the deadly disease, according to an American think-tank expert. Aparna Pande, Director of the India Initiative at the Hudson Institute, made the remarks on Friday during an online discussion on China’s attempts to change the narrative on COVID-19 and how countries in the world are responding to the major health crisis.

China has pushed a charm offensive in South Asia both through offering medical teams, sending test kits and protective equipment and offering to build hospitals. However, the results have been a mixed bag, Pande said.

India’s offer of a regional South Asian response has been an effective counter to Beijing’s attempts to change the narrative, she said. Prime Minister Narendra Modi on March 13 proposed formulation of a joint strategy by the SAARC nations to fight the coronavirus, a suggestion promptly backed by all member states, barring Pakistan.

Calling on the SAARC members to set an example for the world, Modi reached out to the eight-member regional grouping and hosted a video conference among the leaders to chalk out a strong strategy to fight the coronavirus pandemic. According to Pande, Pakistan and Sri Lanka are heavily dependent on Chinese largesse, especially under the Belt and Road Initiative (BRI), and have been the most open to and reciprocated Beijing’s charms.

For Pakistan, strategic relations with China take priority over everything else, including the health of its own people, she said. Pakistan refused to evacuate its citizens, especially students from Wuhan, the epicentre of the coronavirus infection, when the pandemic broke out and, like Iran, did not suspend flights to and from China, she noted.

Further, Pakistani officials including a former ambassador to the UN and the Prime Minister’s Scientific Advisor are “peddling conspiracy theories about the origins of the virus, blaming the US and the UK and absolving China of any responsibility, Pande said.

Sri Lanka, she noted, has gone ahead and signed a 10-year loan of USD 500 million with China Development Bank to help the country mitigate the financial impact of the crisis.

India while avoiding open criticism of China, has sought to counter any Chinese charm offensive by seeking a coordinated regional response through building quarantine shelters in Maldives and Nepal and the SAARC COVID fund to which India has contributed USD 10 million and other countries offered money and aid as well.

“India also has 2 naval ships ready to be deployed to any country that needs assistance in the region, she noted.

There is a vast difference between India and China’s responses as would be between a democracy and an autocratic country, the Hudson scholar said. Lack of proper and detailed planning before imposing a nation-wide lockdown in India have created problems, she added.

However, it can be blamed on lack of planning, not malevolent intent. The state did not anticipate the migrant crisis and so struggled for a few days to deal with it. However, it is not just India, many countries are facing challenges keeping people under lockdown, Pande said.

So, it should be easier to understand the problems facing the world's largest democracy, a country of 1.3 billion people, as it seeks to keep people indoors, curtail the spread and avoid burdening its weak healthcare infrastructure, she said.

For countries like Sri Lanka and Pakistan that were deep in China's grasp, Beijing's grip will be strengthened. For those like Maldives, Nepal, and Bangladesh this will actually strengthen ties with India and wariness of close ties with China or aid from China and I think here India's offer of a South Asian response, aid and technical assistance have helped strengthen those bonds, Pande added.

<https://idr.w.org/indias-call-for-south-asian-response-to-combat-covid-19-counter-chinas-attempts-to-change-narrative/>



Sun, 05 April 2020

America wants to sell India its new F-21 fighter, but it's not what it seems

It resembles a F-16

By David Axe

- **Key point: If India picks the F-21 and opts to keep Lockheed's designation for the type, it rightfully could claim to be the first operator of a brand-new fighter.**

Lockheed Martin in mid-February 2019 offered to sell India a new fighter the company calls the "F-21."

Only it doesn't look like a new fighter at all. The F-21 looks like an F-16.

In fact, the F-21 is an F-16 that Lockheed has upgraded with new cockpit displays, conformal fuel tanks, a larger airframe spine that can accommodate additional electronics, fittings for towed radar decoys, a new infrared sensor and a refueling probe that's compatible with India's Russian-made aerial tankers.

"The F-21 addresses the Indian air force's unique requirements," Lockheed stated.

The rebranding raises an important question. At what point do upgrades transform an old fighter into a new fighter?

It isn't a purely academic question. The number of different fighter types that a country simultaneously can produce is a useful marker of that country's war-making capacity.

India for years has been struggling to replace a large fleet of old, Russian-made warplanes. In 2018 the Indian air force operated 244 1960s-vintage MiG-21s and 84 MiG-27s that are only slightly younger.

The MiG-21s, in particular, are accident-prone. Since the first of 874 MiG-21s entered Indian service in 1963, around 490 have crashed, killing around 200 pilots.

New Delhi wants to spend around \$18 billion building 115 new fighters to replace the old MiGs. The new planes would fly alongside European-designed Jaguars, French Mirage 2000s and Rafales, Russian MiG-29s and Su-30s, and India's own indigenous Tejas fighter in what Lockheed described as "the world's largest fighter aircraft ecosystem."

Competitors for the 115-plane purchase include the F-21, Boeing's F/A-18E/F, the Rafale, the European Typhoon, the Swedish Gripen E and the Russian MiG-35 and Su-35. Indian companies would assemble the new jets on license.

Lockheed initially implied India could follow an acquisition of F-21s with a separate purchase of the company's F-35 stealth fighters.

"The F-21 has common components and learning from Lockheed Martin's fifth-generation F-22 and F-35 and will share a common supply chain on a variety of components," Lockheed stated on its website on the morning of Feb. 20, 2019.

A few hours later, that claim disappeared from the site.

For the purposes of Lockheed's marketing campaign, the F-21 is a new fighter, although it shares many of its major features with the F-16V the company has sold to Bahrain, Greece, Slovakia, South Korea and Taiwan. Lockheed can build new F-16Vs or upgrade older F-16s to the V-standard.

Still, renaming the F-16V isn't only semantic. An F-16V or F-21 is a radically different warplane compared to the F-16A that first flew in 1978. The F-16A is a nimble, eight-ton fighter with an unsophisticated radar and short-range weapons. The F-16V weighs 10 tons, boasts a cutting-edge radar and other sensors and carries a wide array of long-range weaponry, all at the cost of maneuverability.

The only thing an F-16A and an F-16V have in common to any meaningful degree is their basic shape. So why not call the F-16V something different?

U.S. officials at one time deliberately stuck with an old designation for a new plane, all in an effort to make a program seem less risky than it actually was.

After canceling several fighter programs on cost grounds in the early 1990s, the U.S. Navy tapped Boeing to develop a new fighter with the same basic shape as the existing F/A-18, but with a larger fuselage and wing and more powerful engines and sensors.

The Navy called the new plane the "F/A-18E/F." But in every way that mattered, it was a new fighter with different capabilities than the original F/A-18 possessed.

Likewise, the Pentagon acquired three separate stealth fighters with the F-35 designation -- the land-based F-35A, the vertically-landing F-35B and the carrier-based F-35C.

The three F-35 "variants" share very few design elements outside of their cockpits. Lt. Gen. Christopher Bogdan, then the head of the F-35 program office, in 2016 told a seminar audience that the F-35 models are only 20- to 25-percent common.

The danger in not giving a new fighter a new designation is in the impression it creates. In early 2019 China manufactured several fighter types with the basic airframe of the Russian Su-27. Each type has a unique designation. J-11. J-15. J-16.

Add in other fighter types that China was developing at the same time and it would be accurate to say that the country simultaneously made a dozen different fighters for domestic and foreign markets.

By contrast, the United States appeared to make fewer fighter types. After all, as of early 2019 only the F-15, F-16, F/A-18 and F-35 were in production at American factories. And three of the types first appeared in the 1970s or 1980s.

The American tendency to cling to old designations created that false impression. In reality, U.S. companies in early 2019 produced at least six modern fighters types.

They include an advanced F-15 variant that Boeing offered to the U.S. Air Force as the "F-15X" and a new F/A-18E/F model that has almost nothing in common with Boeing's 1980s-vintage F/A-18A/B.

Lockheed meanwhile made three kinds of F-35 plus the F-16V. Or "F-21," if you will.

New Delhi could select its new fighter in 2019. If it picks the F-21 and opts to keep Lockheed's designation for the type, it rightfully could claim to be the first operator of a brand-new fighter.

Even if that fighter appears to the casual observer to be just another old F-16.

<https://nationalinterest.org/blog/buzz/america-wants-sell-india-its-new-f-21-fighter-its-not-what-it-seems-140967>

What would a hypothetical U.S.-Pakistan war look like?

One word: Hell

By Kyle Mizokami

In the U.S. television series *Homeland*, the United States and Pakistan are brought to the brink of war. In real life, the two countries are allies, albeit strained ones at that, and many Americans believe Islamabad often actively works against Washington's interests. If the relationship turned poisonous, how would the United States prosecute a war against Pakistan?

In order to proceed, let's sketch out two war scenarios. In one, we'll assume that the United States is pursuing an air-only campaign, in order to punish the country or strip it of some vital capability—nuclear weapons being a prime example. In the second scenario, the United States seeks to topple the country's government entirely, including the occupation of the capital, Islamabad.

A prolonged U.S. air campaign would be a difficult proposition. Unlike past campaigns against Iraq, Somalia, Yemen, and Afghanistan, Washington would find regional allies who could provide air bases a difficult proposition. Pakistan enjoys warm relations with most of the Sunni states, particularly the United Arab Emirates and Qatar, both of whom have air bases capable of hosting U.S. tactical aircraft, as well as Saudi Arabia and Oman.



A U.S. air campaign directed against Pakistan would largely consist of bomber, carrier, and cruise missile strikes. Strategic bombers, including the B-1, B-2, and B-52 would conduct strikes from the continental United States and the American base on Diego Garcia in the Indian Ocean. Only these aircraft have the range to strike targets in Pakistan from friendly bases. Depending on the level of international support, long-range bombers could also launch from the United Kingdom, including RAF Fairford, improving sortie rates.

The U.S. Navy would play a major role. U.S. forces would neutralize the relatively weak Pakistani Navy. While the Pakistani Navy operates about one hundred ships, it has only a handful of surface combatants of frigate size or larger, and just five aging diesel-electric submarines. Once these are neutralized the U.S. Navy could bring its aircraft carriers closer to the coastline, conducting airstrikes against military targets. Surface warships and nuclear-powered attack submarines would contribute by launching swarms of Tomahawk land-attack cruise missiles against highly defended targets.

An air campaign against Pakistan would be slower and more fraught with difficulty than past campaigns. Pakistan's Air Force has nearly four hundred fighters, including American F-16 Fighting Falcons, and would need to be quickly destroyed. U.S. Navy and Air Force aircraft could see their first significant air to air combat since the 1991 Persian Gulf War.

An all-out invasion of Pakistan would be much more difficult, bordering on impractical. An invasion would require securing the city of Karachi, a coastal city of 14 million, then a march upcountry of approximately 700 miles. Securing Karachi alone would be an immense effort dwarfing efforts to secure Baghdad in the late 2000s, one that required more than 100,000 U.S. troops and the cooperation of local militias.

The Pakistani Army consists of nearly 800,000 active-duty personnel, with significant reserves totaling more than a half-million. Much if not most of this force is arrayed against the border with India, but the U.S. invasion route would actually pass through many of Pakistan's forward-deployed forces. While U.S. forces would be qualitatively superior, it would be a grinding fight that could be interrupted at any time by Pakistani nuclear weapons.

Of course, there is one regional power that can provide everything the U.S. needs, including local air bases and a large army, navy, and air force, already positioned in the theater with well-sketched battle plans: India. India could help with an air campaign, providing runways for U.S. fighter bombers to operate from, or even contribute its own airpower. Indian ground forces have a far shorter route to Islamabad and overmatch Pakistani forces on the ground.

The question is whether or not India would join a U.S.-led coalition against Pakistan. India has seldom cooperated with the United States in military operations, declining to send troops to Iraq and Afghanistan, among others. India's cooperation would largely depend on the circumstance, the most likely being the U.S. joining an Indian-led coalition against Pakistan.

Another power that could join such a conflict is China. China and Pakistan enjoy warm relations, and the rhetoric between the two countries suggests a relationship nearing that of a mutual defense pact. But it isn't, and it's not clear that China would risk direct conflict with the United States if Pakistan in some way overreached. China might, on the assumption that a U.S. puppet state in neighboring Pakistan would diminish China's power and influence abroad. It's worth remembering that the last time Chinese forces fought Americans was after the U.S.-led United Nations forces advanced into a state neighboring Beijing.

A U.S. war with Pakistan would be extremely difficult to wage and fraught with difficulty. It would also be forced to proceed under the assumption that some Pakistani nuclear weapons would survive a sustained effort to destroy them, to be used against U.S. forces or targets in some way later in the campaign. This is the sort of uncertainty that can veto military action and makes a war between Washington and Islamabad an absolute conflict of last resort.

<https://nationalinterest.org/blog/buzz/what-would-hypothetical-us-pakistan-war-look-141072>



Sat, 04 April 2020

IIT- Delhi invites proposals for supercomputer-based Coronavirus research

In this, the allocation of supercomputer resource to merit-based proposals will be made for three months and a total of Rs 1 crore worth of computational time will be provided to them for free. Each proposal will have a maximum cap of Rs 10 lakh worth of computational resource, reads a statement.

New Delhi: IIT-Delhi has invited proposals from the government and the private academic institutions as well as private firms in association with an academic partner from all over the country to use its supercomputer resource PADUM for COVID-19 research.

In this, the allocation of supercomputer resource to merit-based proposals will be made for three months and a total of Rs 1 crore worth of computational time will be provided to them for free. Each proposal will have a maximum cap of Rs 10 lakh worth of computational resource, reads a statement.

The allocation period can be extended to six months after evaluating the performance of the projects.

“In these difficult times, the sharing of resources is important in order to address the infrastructure requirements of researchers working on the coronavirus. IIT-Delhi has taken a principled stand and wishes to set an example for this. It is important for scientists to collaborate

with each other given the urgency of the situation,” said Prof V Ramgopal Rao, Director, IIT-Delhi.

The researchers have been asked to submit their proposals by April 15. After the submission of proposals, experts from the IIT-Delhi will evaluate them on the first come first serve basis.

After selection of the proposals, IIT-Delhi will provide basic and limited support to them, which will include instructions on job submissions or smooth functioning of these projects, the statement said.

Along with this, all researchers from India have also been welcomed to use supercomputer at IIT Delhi for COVID-19 research on payment basis. “IIT Delhi will match to 2X the amount contributed for supercomputer (high-performance computing-HPC) usage for COVID-19 research,” the statement added.

In this payment basis mode, the institute is allocating a budget of Rs 5 crore worth of high-performance computational resource (supercomputer) for the next six months. (ANI)

<https://www.hindustantimes.com/education/iit-delhi-invites-proposals-for-supercomputer-based-coronavirus-research/story-88DWZTn4K5TH2W2lLeb0WP.html>

Science

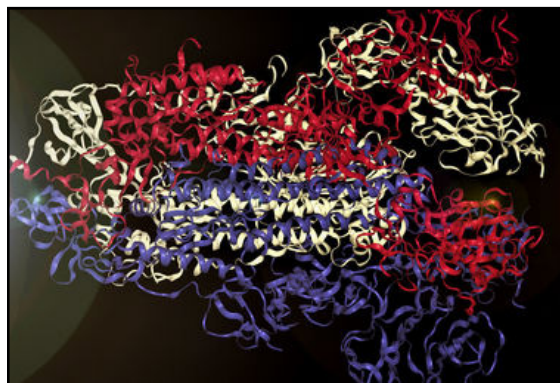
Sat, 04 April 2020

Scientists have turned the structure of the coronavirus into music

By Vineeth Venugopal

You’ve probably seen dozens of images of the novel coronavirus—now responsible for 1 million infections and tens of thousands of deaths. Now, scientists have come up with a way for you to hear it: by translating the structure of its famous spike protein into music.

The sounds you hear—the chiming bells, the twanging strings, the lilting flutes—all represent different aspects of the spikelike protein (above) that pokes from the virus’ surface and helps it latch onto unsuspecting cells. Like all proteins, the spikes are made of combinations of amino acids. Using a new technique called sonification, scientists from the Massachusetts Institute of Technology assigned each amino acid a unique note in a musical scale, converting the entire protein into a preliminary musical score.



But in real life, these amino acids tend to curl up into a helix or stretch out into a sheet. Researchers capture these features by altering the duration and volume of the notes. Molecular vibrations due to heat also get their own sounds.

But why would you set a virus to music? The new format can help scientists find sites on the protein where antibodies or drugs might be able to bind—simply by searching for specific musical sequences that correspond to these sites. This, the researchers say, is faster and more intuitive than conventional methods used to study proteins, such as molecular modeling. They add that by comparing the musical sequence of the spike protein to a large database of other sonified proteins, it might be possible to one day find one that can stick to the spike—preventing the virus from infecting a cell.

As for the instruments, they were entirely the researchers’ choice. In this case, a Japanese koto plays the main notes—soothing sounds that might bring some comfort in a time of trouble.

<https://www.sciencemag.org/news/2020/04/scientists-have-turned-structure-coronavirus-music>

Coronavirus: लक्षण दिखना बंद होने के हफ्ते भर बाद भी हो सकते हैं कोरोना से संक्रमित, अध्ययन में दावा

कोरोना वायरस को लेकर वैज्ञानिक और शोधकर्ता लगातार रिसर्च कर रहे हैं। इसके लक्षणों से लेकर इसके इलाज को लेकर हो रहे रिसर्च में हर दिन कोई न कोई नई जानकारी सामने आ रही है। हाल ही में हुई एक रिसर्च स्टडी में इस बात का पता चला है कि लक्षण दिखना बंद होने के हफ्ते भर बाद भी मरीज कोरोना वायरस से संक्रमित हो सकते हैं। चीन के पीएलए जनरल अस्पताल और येल यूनिवर्सिटी स्कूल ऑफ मेडिसिन की संयुक्त रिसर्च स्टडी में यह बात सामने आई है।

शोधकर्ताओं के मुताबिक रिसर्च के दौरान चीन में कोरोना से संक्रमित 16 मरीजों पर नजर रखी जा रही थी। इनमें से आधे मरीजों में लक्षण खत्म होने के आठ दिन तक वायरस के ट्रेस थे। इस स्टडी में चीन के जिन मरीजों को सैंपल के तौर पर रखते हुए स्टडी की गई, वे मरीज 28 जनवरी से नौ फरवरी तक अस्पताल में भर्ती थे।

येल स्कूल ऑफ मेडिसिन के इंस्ट्रक्टर डॉ. लोकेश शर्मा के मुताबिक कोरोना से संक्रमित 16 में से आठ मरीजों में लक्षण खत्म होने के कारण भी उनके शरीर में वायरस मौजूद रहे। ऐसी स्थिति में वायरस का संक्रमण और गंभीर हो सकता है। आमतौर पर लक्षण दिखने में तीन से पांच दिन लगते हैं, लेकिन एक मरीज में आठवें दिन लक्षण दिखे। रिसर्च के दौरान मरीजों के गले से सैंपल लेकर नियमित तौर पर जांच की गई।

कंट्रोल डिजीज एंड प्रिवेंशन कंट्रोल, अमेरिका के मुताबिक, जिन मरीजों का बुखार बिना दवाओं के ठीक हुआ हो, उनमें लक्षण दिखने पर कम से कम तीन दिन के लिए आइसोलेट करना चाहिए। इस स्टडी में भी शोधकर्ताओं की सलाह है कि कोरोना मरीजों के लिए आइसोलेशन पीरियड 14 दिन है, जिसे बढ़ाने की जरूरत है, ताकि ऐसे मरीजों से दूसरों लोगों में संक्रमण न फैल सके।

शोधकर्ता डॉ. लीजिन शी का सुझाव है कि लोग खुद को लंबे समय तक आइसोलेट करें। उनकी सलाह है कि यदि किसी को कोरोना के लक्षण महसूस हों तो उन्हें खुद को सेल्फ क्वारंटीन करना चाहिए। दो हफ्तों तक क्वारंटीन में रहने से भी लक्षण न समझ आए तो भी क्वारंटीन को जारी रखना चाहिए, क्योंकि कोरोना संक्रमित मरीज ठीक होने के बाद भी उनसे संक्रमण का खतरा हो सकता है।

<https://www.amarujala.com/photo-gallery/lifestyle/fitness/coronavirus-research-covid-19-patient-latest-symptoms-and-signs-of-corona-disease-know-the-warning-signs>