

Coronavirus lockdown | DRDO gears up to make 20,000 PPE a day

At a Defence Ministry review meeting, three Service Chiefs and other officials highlight their efforts

A laboratory under the Defence Research and Development Organisation (DRDO) had made arrangements to make 20,000 Personal Protective Equipment (PPE) a day and the DRDO was also engaged in minor modification of ventilators so that one machine could support four patients at a time, its Chairman, Satheesh Reddy, informed Defence Minister Rajnath Singh on Wednesday.

At a review meeting of the Ministry held through videoconferencing to contain Coronavirus, the three Service Chiefs and other officials too appraised him of their efforts.

Dr. Reddy informed that 50,000 litres of sanitizers made by the DRDO labs were supplied to various security entities, including the Delhi Police and another one lakh litres supplied all over the country, the Defence Ministry said in a statement. “Dr. Reddy said a five-layered nanotechnology face mask N99 are being made on a war footing. Ten thousand have already been made and soon per day production will be extended to 20,000,” the statement said.



Chief of the Defence Staff Gen. Bipin Rawat informed that separate hospitals have been identified to exclusively deal with COVID-19 and more than 9,000 hospital beds were available. “Over 1,000 evacuees are quarantined at facilities in Jaisalmer, Jodhpur, Chennai, Manesar, Hindan and Mumbai. Their quarantine period will end by April 7,” he said.

The Indian Air Force (IAF) had airlifted 25 tonnes of medical supplies in the last three days from Delhi, Surat, Chandigarh to Manipur, Nagaland and the Union Territories of Jammu and Kashmir and Ladakh, informed Air chief Marshal RKS Bhadauria.

These include PPE, hand sanitizers, surgical gloves, thermal scanners and medical personnel, the IAF said, adding that regular airlift of COVID-19 test samples from Ladakh to Delhi was also being carried out.

Army Chief Gen Manoj Naravane informed that more than 8,500 doctors and support staff were available to extend necessary assistance to the civilian administration. On providing assistance to neighbouring countries, he said that “assistance to Nepal in the form of medical equipment will be delivered shortly.”

Navy chief Admiral Karambir Singh said naval ships were on a standby to extend any required assistance.

Retired health professionals have also been kept in readiness to volunteer their services, said Lt. Gen. Anup Banerji, Director General Armed Force Medical Services (AFMS). Approximately, 25,000 National Cadet Corps (NCC) cadets were “being mobilised to provide necessary local assistance.”

<https://www.thehindu.com/news/national/coronavirus-lockdown-drdo-gears-up-to-make-20000-ppe-a-day/article31229996.ece>

India's fight against Covid-19 needs wartime industrial production, not more red tape

A credible industrial response during the coronavirus lockdown will translate into better provisioning for India's overall healthcare sector in future

By Saurav Jha

New Delhi: India's fight against Covid-19 requires a domestic industrial response that is akin to wartime production. At this hour, India's lazy procurement culture of depending on imports will simply not cut it, given that the international availability of pandemic-fighting kits — whether it be test kits or ventilators or even personal protective equipment (PPE) — is already riven with shortages. Rather, indigenous production of such equipment has the potential to serve the world at this time of need and help beyond fighting just the pandemic by allowing key industries to keep humming.

As we shall see, there are examples aplenty that give us confidence that Indian industry can indeed rise to the challenge. However, any industrial response will operate within the ambit of India's larger institutional response, which needs to be repurposed for rapid provisioning using domestic sources and this is as good a time as any to do that. Indeed, while a 'whole of society' approach may be touted by New Delhi, that 'whole' needs to shed the red tape for once.

India's Potential

The curious case of newly developed indigenous test-kits being accepted for trials by the Indian Council of Medical Research's (ICMR's) National Institute of Virology (NIV), only for the suppliers to hear from the Drug Controller General of India that they needed USFDA or European CE approval before commencing production must not be repeated. Of course, the Narendra Modi government has since clarified that an ICMR-NIV stamp is now sufficient and at least one indigenous kit has already passed trials and is scheduled to enter the market shortly.

Incidentally, this test-kit called PathoDetect made by MyLab is going to cost only a quarter of what imported test-kits cost, can deliver results much faster and has demonstrated 100 per cent 'sensitivity and specificity' in ICMR evaluations. Better still, the company says that it can deliver between 1-1.5 lakh patient tests every week.

There are other indigenous kits that are also close to demonstrating the necessary reliability levels and their entry into the market will provide India with the ability to conduct hundreds of thousands of tests per week, if it can concomitantly deploy enough trained paramedics with PPE and viral transport media (VTM). Although ICMR doesn't believe in what it calls 'indiscriminate testing', it is clear that much greater testing will be required to achieve what the ICMR wants to do — 'isolate, isolate, isolate'.

Cheaper and potentially superior domestic test-kits being rapidly produced is exactly the sort of 'innovation at scale' that India needs to comprehensively contain the novel coronavirus. However, it was only late last week that the Technology Development Board (TDB) under the Department of Science & Technology 'invited' proposals for fighting Covid-19 and wants those related to respiratory or protective equipment to be submitted before 27 March 2020.

Move Beyond Proposals

While the TDB move is noteworthy, this is not the time to merely invite proposals for possible innovative solutions to combat COVID-19. The Modi government should be pro-actively scouring India's scientific-technological landscape to identify possible breakthroughs. Because other countries certainly are.

Take the case of a Covid-19 inhibiting device invented by Bengaluru-based scientist Rajah Vijay Kumar, which is currently being evaluated by the US and Mexico.

Naturally, any relevant innovation or invention needs to be mass-produced, given the situation. Then there is the issue of increasing production of even well-established items such as ventilators and PPE, stocks of which are currently inadequate. In the matter of ventilators, some progress is being made with the government engaging Skanray Technologies, a domestic ventilator-maker that exports units to some 80 countries worldwide. Although currently able to produce only about 200 units on a monthly basis, Skanray says that it can ramp up production to 30,000 in a couple of months and to about a lakh subsequently.

Skanray is also offering its designs to other companies, so that they too can ramp up production. However, India's ventilator-makers depend on imported components and increased production requires either greater imports or indigenisation of the same.

While some military flights will be mounted to source imports, the Defence Research and Development Organisation (DRDO) is now working with Skanray and others to get the necessary components from India's aerospace and defence parts' suppliers. Here too, the use of India's small but growing clutch of 3D printing companies such as WIPRO 3D can be enlisted to manufacture key ventilator components such as regulator valves, as is already being done elsewhere in the world. Incidentally, DRDO is working on a multi-patient ventilator, which is expected to be ready for production by the first week of April 2020, and the Mahindra Group has been roped into making components for this design. This ventilator will cost around Rs 4 lakh.

Bharat Electronics Limited has now been asked by the government to manufacture some 30,000 ventilators in a consortium with Skanray. And the Department of Science and Technology (DST) has given a Pune-based start-up Rs 1 crore to make negative ion generators that can scrub a room of up to 99.7 per cent of its viral load in an hour. Some 1,000 such negative ion generators are expected to be deployed to hospitals across Maharashtra shortly.

Preparing for the Future

Even as the ventilator availability issue seems likely to get resolved, much greater movement is required on the PPE front, with social media already awash with doctors across India flagging shortages of even simple kit such as masks and gloves. While the government says that it is taking adequate steps to scale up indigenous sourcing of the same keeping in mind technical requirements, material availability and standards, the difference on the ground is yet to be felt.

Ultimately, the Covid-19 industrial response has to be on a proverbial war-footing. Which means the usual processes of government procurement will simply not do. As such, it is better if the Modi government creates an 'Empowered Committee for Covid-19 Production' that operates under Defence Regulation-11 (DR-11), which enables the government to provision itself without the usual multi-step procurement chain. This can be invoked even for the production and stocking of disinfectants as well as VTMs. VTMs will be crucial to any mass testing effort, since preserving samples on the way to laboratories is sine qua non for that.

Building up strategic reserves of vital equipment even as India is in a lockdown is a no-brainer, really. It is not just a matter of stocking up for testing and critical care related to Covid-19 suppression efforts either. Adequate provisioning will also ensure that the 'rest of healthcare' does not end up suffering due to coronavirus-related diversion of supplies. Furthermore, if the lockdown succeeds in breaking the chain of transmission and India averts a pandemic, the scaled-up production will help India meet worldwide shortages of such items. Adapted for industrial uses, PPE can also be used to re-start production in the wider industrial sector once India moves towards normalcy.

In the end, a credible industrial response will translate into better and cheaper provisioning for India's overall healthcare sector in the years ahead.

(The author is a former consultant to FICCI's International Division and Chief Editor of Delhi Defence Review. His Twitter handle is @SJha1618. Views are personal.)

<https://theprint.in/opinion/india-covid-19-needs-wartime-industrial-production/391902/>

Thu, 02 April 2020

Covid-19: Rajnath Singh tells armed forces to 'redouble work', coordinate with other ministries

By Rajat Pandit

New Delhi: The armed forces have kept over 9,000 hospital beds ready to treat Covid-19 patients, along with more than 8,500 doctors and support staff to extend necessary assistance to civilian administrations, even as military aircraft have transported around 25 tonne of medical supplies around the country in the last three days. Having already supplied around 1.5 lakh litres of sanitizers to different organizations, the DRDO is also making five-layered nano technology N99 face masks and PPE (personal protective equipment) on a war-footing now.

Taking stock of the efforts being made by the Army, Navy and IAF as well as DRDO, Defence PSUs and Ordnance Factory Board in terms of evacuation, medical care, quarantine facilities and production of medical equipment, defence minister Rajnath Singh on Wednesday asked them to “redouble their work” and closely coordinate with other ministries in the national endeavour to fight the coronavirus outbreak.

DRDO Chief Dr G Satheesh Reddy said his organization had already made 10,000 N99 masks and their daily production would be ramped up to 20,000 soon. “DRDO has also supplied 40,000 other face masks to the Delhi Police. A DRDO lab has also made arrangements to make 20,000 PPE per day. We also engaged in minor modification of ventilators so that one machine can support four patients at the same time,” he said

Chief of Defence Staff General Bipin Rawat, in turn, told the minister that 28 military hospitals, with over 9,000 beds, have been earmarked to exclusively deal with military and civilian Covid-19 patients.

Over 1,000 evacuees from countries like Italy, Iran and Malaysia are quarantined at military facilities in Jaisalmer, Jodhpur, Chennai, Manesar, Hindon and Mumbai. Their quarantine period will end by April 7, he said.

Navy Chief Admiral Karambir Singh said warships were on standby to extend assistance to civil administrations. The IAF, on its part, has airlifted nearly 25 tonnes of essential medical supplies from Delhi, Surat and Chandigarh to Manipur, Nagaland, J&K and Ladakh.

“Regular airlift of Covid-19 test samples from Ladakh to Delhi is also being carried out. IAF is adequately geared up to meet all the emerging demands, with aircraft like C-17s, C-130Js, An-32s, Avros and Dorniers being tasked as and when required basis,” said Air Chief Marshal RKS Bhadauria.

Army Chief General MM Naravane, in turn, informed Singh that over 8,500 doctors and support staff are ready to extend necessary assistance to civilian administrations. In keeping with the defence minister’s direction that help should be provided to neighbouring countries, assistance to Nepal in the form of medical equipment will be delivered shortly, he added.

Director General of the Armed Forces Medical Services Lt-General Anup Banerji said necessary equipment has been procured and dispatched to various hospitals. While retired health professionals have also been kept in readiness to volunteer their services, around 25,000 NCC cadets are being mobilized to provide necessary local assistance.

<https://timesofindia.indiatimes.com/india/covid-19-rajnath-singh-tells-armed-forces-to-redouble-work-coordinate-with-other-ministries/articleshow/74932739.cms>

कोरोना के खिलाफ सेना की तैयारी/133 अस्पताल, साढ़े 8 हजार डॉक्टर, 9 हजार बेड तैयार; डीआरडीओ 4 मरीजों को सपोर्ट करने वाला वेंटिलेटर बना रहा

रक्षा मंत्री राजनाथ सिंह ने कोविड-19 की तैयारियों के संबंध में बुधवार को वीडियो कॉन्फ्रेंस के जरिए सीडीएस जनरल बिपिन रावत और तीनों सेना प्रमुखों से बात की

- सेना प्रमुख जनरल एमएम नरवणे ने बताया- सैन्य अस्पतालों में 9 हजार से ज्यादा बेड उपलब्ध
- नौसेना प्रमुख एडमिरल करमबीर सिंह के मुताबिक, कोरोना से निपटने के लिए नौसेना के जहाज भी स्टैंडबाय पर

- डीआरडीओ ने अब तक 1.50 लाख लीटर सैनिटाइजर सप्लाई किए, रोज 10 हजार मास्क बना रहा

नई दिल्ली: देश में कोरोना मरीजों की संख्या लगातार बढ़ती जा रही है। इससे निपटने के लिए तीनों सेनाओं ने भी पुख्ता तैयारी की है। रक्षा मंत्री राजनाथ सिंह ने बुधवार को इस संबंध में वीडियो कॉन्फ्रेंसिंग के जरिए मीटिंग की। इसमें मौजूद चीफ ऑफ डिफेंस स्टाफ (सीडीएस) जनरल बिपिन रावत ने कहा- सेना के अस्पतालों में 9 हजार से ज्यादा बेड उपलब्ध हैं। उन्होंने बताया कि जैसलमेर, जोधपुर, चेन्नई, मानेसर, हिंडन और मुंबई में 1 हजार से ज्यादा लोगों को क्वारैंटाइन में रखा गया है। इसकी मियाद 7 अप्रैल को खत्म हो रही है। मार्च 2018 तक के आंकड़ों के मुताबिक, देशभर में सेना के 133 अस्पताल हैं। इनमें से 112 मिलिट्री, 12 एयरफोर्स और 9 नेवी के हैं।

इस वीडियो कॉन्फ्रेंसिंग के जरिए रक्षा मंत्री ने आर्मी चीफ जनरल एमएम नरवणे, एयरफोर्स चीफ आरकेएस भदौरिया, नेवी चीफ एडमिरल करमबीर सिंह, आर्म्ड फोर्सिस मेडिकल सर्विस के डीजी लेफ्टिनेंट जनरल अनूप बनर्जी और डीआरडीओ चेयरमैन डॉ. सतीश रेड्डी से भी बात की।

कोरोना से निपटने के लिए तीनों सेना की तैयारी :

आर्मी चीफ जनरल एमएम नरवणे : साढ़े 8 हजार से ज्यादा डॉक्टर्स और मेडिकल स्टाफ तैयार है। सेना के अस्पतालों में 9 हजार से ज्यादा बेड उपलब्ध।

एयरफोर्स चीफ एयर मार्शल आरकेएस भदौरिया : पिछले 5 दिन में वायुसेना ने देश के अलग-अलग हिस्सों में 25 टन से ज्यादा मेडिकल इक्विपमेंट की सप्लाई की है।

नेवी चीफ एडमिरल करमबीर सिंह : किसी भी स्थिति से निपटने के लिए नौसेना के जहाज स्टैंडबाय पर हैं। जरूरत पड़ने पर लोकल एडमिनिस्ट्रेशन के साथ मिलकर भी काम किया जा रहा है।

25 हजार एनसीसी कैडेट्स और रिटायर्ड हेल्थ प्रोफेशनल्स भी तैयार

आर्म्ड फोर्सिस मेडिकल सर्विस के डीजी लेफ्टिनेंट जनरल अनूप बनर्जी ने रक्षा मंत्री को बताया कि रिटायर्ड हेल्थ प्रोफेशनल्स भी सेवा देने के लिए तैयार हैं। उन्होंने बताया कि 25 हजार से ज्यादा एनसीसी कैडेट्स को भी ट्रेनिंग दी जा रही है।

डीआरडीओ एक समय में 4 मरीजों को सपोर्ट करने वाला वेंटिलेटर बना रहा

डीआरडीओ के चेयरमैन डॉ. डीजी सतीश रेड्डी ने रक्षा मंत्री राजनाथ सिंह को बताया कि डीआरडीओ लैब में बनाए गए 50 हजार लीटर सैनिटाइजर दिल्ली पुलिस समेत अलग-अलग सुरक्षा बलों को सप्लाई किए गए हैं। इसके अलावा, 1 लाख लीटर सैनिटाइजर देशभर में सप्लाई हुआ। उन्होंने बताया कि अभी रोज 10 हजार पांच लेयर वाले नैनो टेक्नोलॉजी फेस मास्क एन-99 बनाए जा रहे हैं और जल्द ही इसका प्रोडक्शन बढ़ाकर रोजाना 20 हजार किया जाएगा। डीआरडीओ ने 40 हजार फेस मास्क दिल्ली पुलिस को दिए हैं। डॉ. रेड्डी ने बताया कि हमारी एक लैब में रोज 20 हजार पीपीई यानी पर्सनल प्रोटेक्टिव इक्विपमेंट बनाए जा रहे हैं। इसके साथ ही एक ऐसा वेंटिलेटर भी बनाने की तैयारी है, जो एक समय में 4 मरीजों को सपोर्ट कर सके।

रक्षा मंत्रालय के सभी कर्मचारी पीएम-केयर फंड में एक दिन की सैलरी देंगे

कोरोनावायरस से लड़ने के लिए बनाए गए पीएम-केयर फंड में रक्षा मंत्रालय के भी सभी कर्मचारी एक दिन की सैलरी देंगे। बुधवार को रक्षा मंत्री राजनाथ सिंह ने इस प्रस्ताव को मंजूरी दी। ऐसा अनुमान है कि आर्मी, नेवी और एयरफोर्स समेत रक्षा मंत्रालय के अधीन आने वाली सभी विंग के कर्मचारियों की एक दिन की सैलरी से 500 करोड़ रुपए का फंड मिलेगा।

<https://www.bhaskar.com/national/news/133-hospitals-8-thousand-doctors-9-thousand-beds-ready-drdo-remains-ventilator-supporting-4-patients-127088702.html>



Thu, 02 April 2020

कोरोना लॉकडाउन: एक वेंटिलेटर से 4 मरीजों को मिलेगी मदद, DRDO कर रहा है तैयार

कोरोना वायरस (Coronavirus) से संक्रमित मरीजों के इलाज के लिए अस्पतालों में वेंटिलेटर की कमी को देख डीआरडीओ (DRDO) ने विकसित की तकनीक। डीआरडीओ हर दिन 20 पर्सनल प्रोटेक्शन इक्विपमेंट (PPE) बनाने की तैयारी में भी जुटा है

संदीप बोल

नई दिल्ली: कोरोना वायरस (Coronavirus) से बचाव के लिए देश के अस्पतालों में वेंटिलेटर की कमी को दूर करने के लिए रक्षा अनुसंधान एवं विकास संगठन यानी डीआरडीओ (DRDO) आगे आया है। डीआरडीओ ने ऐसी तकनीक विकसित की है, जिससे एक वेंटिलेटर से एक बार में चार मरीजों को मदद दी जा सकेगी। डीआरडीओ के निदेशक का कहना है कि इसके लिए हम कोई नया वेंटिलेटर (ventilator) नहीं बना रहे हैं, बल्कि जो पहले से हैं, उन्हीं में कुछ संशोधन कर रहे हैं। इस तरह से कोरोना से पीड़ित किसी भी मरीज को वेंटिलेटर की कमी नहीं होने दी जाएगी। इसके अलावा डीआरडीओ 20 हजार पर्सनल प्रोटेक्शन इक्विपमेंट (PPE) हर दिन बनाने की तैयारी में भी जुटा हुआ है।

युद्धस्तर पर बनाए जा रहे हैं N99 मास्क

डीआरडीओ निदेशक डॉ. जी. सतीश रेड्डी ने रक्षामंत्री राजनाथ सिंह को जानकारी देते हुए बताया कि हमारे संस्थान में रात-दिन युद्धस्तर पर N99 मास्क बनाए जा रहे। किसी भी स्तर पर इसकी कमी नहीं

होने दी जाएगी। दिल्ली पुलिस को अभी तक 40 हजार मास्क की सप्लाई की जा चुकी है। वहीं दिल्ली पुलिस सहित देशभर में डीआरडीओ ने एक लाख लीटर सैनेटाइजर की सप्लाई भी की है।

<https://hindi.news18.com/news/delhi-ncr/corona-lockdown-single-ventilator-will-help-for-patients-drdo-is-researching-dlnh-2979040.html>

THE TIMES OF INDIA

Thu, 02 April 2020

Military ready with 9,000 beds, 8,500 docs & staff

New Delhi: The armed forces have kept over 9,000 hospital beds ready to treat Covid-19 patients, along with more than 8,500 doctors and support staff to extend necessary assistance to civilian administrations, even as military aircraft have transported around 25 tonne of medical supplies around the country in the last three days.

Having already supplied around 1.5 lakh litres of sanitisers to different organisations, the DRDO is also making five-layered nano technology N99 face masks and PPE (personal protective equipment) on a war-footing now.

Taking stock of the efforts being made by the Army, Navy and IAF as well as DRDO, defence PSUs and Ordnance Factory Board in terms of evacuation, medical care, quarantine facilities and production of medical equipment, defence minister Rajnath Singh on Wednesday asked them to “redouble their work” and closely coordinate with other ministries in the national endeavour to fight the coronavirus outbreak.



DRDO Chief Dr G Satheesh Reddy said his organisation had already made 10,000 N99 masks and their daily production would be ramped up to 20,000 soon. “DRDO has also supplied 40,000 other face masks to the Delhi Police. A DRDO lab has also made arrangements to make 20,000 PPE per day. We also engaged in minor modification of ventilators so that one machine can support four patients at the same time,” he said.

Chief of Defence Staff General Bipin Rawat, in turn, told the minister that 28 military hospitals, with over 9,000 beds, have been earmarked to exclusively deal with military and civilian Covid-19 patients.

Over 1,000 evacuees from countries like Italy, Iran and Malaysia are quarantined at military facilities in Jaisalmer, Jodhpur, Chennai, Manesar, Hindon and Mumbai. Their quarantine period will end by April 7, he said.

Navy chief Admiral Karambir Singh said warships were on standby to extend assistance to civil administrations. The IAF, on its part, has airlifted nearly 25 tonnes of essential medical supplies from Delhi, Surat and Chandigarh to Manipur, Nagaland, J&K and Ladakh.

“Regular airlift of Covid-19 test samples from Ladakh to Delhi is also being carried out. IAF is adequately geared up to meet all the emerging demands, with aircraft like C-17s, C-130Js, AN-32s, Avros and Dorniers being tasked as and when required basis,” said Air Chief Marshal RKS Bhadauria.

Army Chief General MM Naravane, in turn, informed Singh that over 8,500 doctors and support staff are ready to extend necessary assistance to civilian administrations. In keeping with the defence minister’s direction that help should be provided to neighbouring countries, assistance to Nepal in the form of medical equipment will be delivered shortly, he added.

Director General of the Armed Forces Medical Services Lt-General Anup Banerji said necessary equipment has been procured and dispatched to various hospitals. While retired health

professionals have also been kept in readiness to volunteer their services, around 25,000 NCC cadets are being mobilised to provide necessary local assistance.

<https://timesofindia.indiatimes.com/india/military-ready-with-9000-beds-8500-docs-staff/articleshow/74940104.cms>



Thu, 02 April 2020

Military joins in as India wages war against coronavirus

DRDO and Ordnance Factory Board said they have joined the war with production of five-layered nano technology face mask, hand sanitisers, face masks and Personal Protective Equipments

New Delhi: Indian military has readied its men, machines and resources to fight against coronavirus.

While the Chief of Defence Staff Bipin Rawat said that more than 9,000 hospital beds have been made available to deal with COVID-19, Army Chief General M M Naravane informed that more than 8,500 doctors and support staff are also available to extend necessary assistance to civilian administration.



The CDS, Service Chiefs and other Department heads were briefing the Defence Minister Rajnath Singh about their work till date and future plans through video conferencing on Wednesday

The Ministry of Defence (MoD) informed that the meeting was held through video conferencing. “Defence Minister appreciated the efforts being made by various Services, organisations and DPSUs in terms of evacuation, provision of healthcare in quarantine facilities and research & production of medical equipment such as sanitizers, facemasks and Personal Protective Equipments (PPEs). He directed all the organisations to redouble their efforts and work in close coordination with other ministries and organizations of Central Government in this crucial time.” said MoD

Referring to Rajnath Singh’s direction that help should be provided to neighbouring countries, Army Chief Naravane said that assistance to Nepal in the form of medical equipment will be delivered shortly.

Admiral Karambir Singh told the minister that naval ships are on the standby to extend any required assistance and is also extending assistance as required by local civilian administration.

Air Force is carrying on its all critical operational work while ensuring all necessary precautions. The Air Force planes transported approximately 25 tonnes of medical supplies in last five days, Chief, Air Chief Marshal R K S Bhadauria informed.

50,000 litres of sanitizers made by DRDO labs was supplied to various security entities, including Delhi Police. Another one lakh litres was supplied all over the country, said Dr G Satheesh Reddy, Secretary Department of Defence R&D and Chairman DRDO.

Dr Reddy said that five-layered nano technology face mask N99 are being made on war footing. 10,000 masks have already been made and soon per day production will be extended to 20,000. Ordnance Factory Board (OFB) is also engaged in manufacturing hand sanitisers, face masks and Personal Protective Equipments.

DRDO labs have also supplied 40,000 masks to Delhi Police. Another DRDO laboratory has also made arrangements to make 20,000 PPEs per day. DRDO is also engaged in minor

modification of ventilators so that one machine can support four patients at the same time, Dr Reddy added.

Approximately 25,000 National Cadet Corps (NCC) cadets are being mobilised to provide necessary local assistance, the minister was told during the meeting.

<https://www.newindianexpress.com/nation/2020/apr/01/military-joins-in-as-india-wages-war-against-coronavirus-2124408.html>

The Indian **EXPRESS**

Thu, 02 April 2020

HEMRL supplies disinfectants and hand sanitisers to civil, defence bodies

Officials from HEMRL said the facility is making available as many as 20,000 litres of of disinfectant and 200 litres of hand sanitiser per week free-of-cost to the PMC for healthcare personnel and residents of Pune. The first consignment was handed over on Monday

Pune: The High Energy Materials Research Laboratory (HEMRL), a Pune-based research and development facility of the Defence Research and Development Organisation (DRDO), has started supplying disinfectants and hand sanitisers to the Pune Municipal Corporation (PMC) and various defence establishments in and around Pune.

Officials from HEMRL said the facility is making available as many as 20,000 litres of disinfectant and 200 litres of hand sanitiser per week free-of-cost to the PMC for healthcare personnel and residents of Pune. The first consignment was handed over on Monday.

The HEMRL is also supplying disinfectants and hand sanitisers to DRDO institutions like Armament Research and Development Establishment, Research and Development Establishment (Engineers), Vehicle Research and Development Establishment and allied defence institutions like Garrison Engineers, Estate Management Unit, Chief Construction Engineer and Controller of Defence Accounts.

HEMRL is also supporting other defence institutions like 12 Mahar Regiment and the Armed Forces Medical College. Officials said the facility follows the quality standards as per ISO 9001: 2015 and high quality standards are maintained for preparation of the hand rub sanitiser as per the formulation suggested by the WHO. ENS

<https://indianexpress.com/article/cities/pune/petrol-pumps-fuel-coronavirus-lockdown-essential-goods-6342499/>

The Tribune

Thu, 02 April 2020

DRDO makes N-99 mask to combat virus

New Delhi: The Defence Research and Development Organisation (DRDO) has developed a new mask, N-99, in the wake of Covid-19 outbreak. The mask has five layers and has been made using nano-technology.

Some 10,000 masks have been made, and soon 20,000 masks will be produced per day. A few days ago, the DRDO announced that a modification in ventilators would allow one machine to support four patients at a time.

Another DRDO laboratory has also made arrangements to make 20,000 personal protective equipment (PPE). The PPE is in demand all over the country and is used by doctors and nurses, who are attending Covid suspects. This was revealed by DRDO chief Dr G Sateesh Reddy at a

review meeting with Defence Minister Rajnath Singh in Delhi on Wednesday. Singh has asked all organisations under the MoD to redouble their efforts.

The Navy has put ships on standby, while the IAF has transported some 25 tonnes of medical supplies.

<https://www.tribuneindia.com/news/nation/drdo-makes-n-99-mask-to-combat-virus-64285>



Thu, 02 April 2020

After body suits, hand and body sanitisers, N-99 masks, DRDO gears up to produce ventilators useful for 4-8 patients

By Laxitha Mundhra

The Defence Research and Development Organisation or the DRDO is an agency of the Government of India under the Ministry of Defense. It is the military research and development centre that offers cutting edge military technology. During this Coronavirus Pandemic, it has done the same and waged a “War Against Corona”.

Earlier in March 2020, the organisation developed three medical equipment and it has now launched the fourth one. The Defence Bio-Engineering & Electro Medical Laboratory (DEBEL), Bengaluru is a DRDO lab. The lab had identified a vendor (Scanray Tech Pvt Ltd, Mysore) to produce ventilators. “Innovation is on to create ‘Multi patient-ventilator’ wherein several patients can be supported by a single ventilator. This innovation is expected to be available within a week,” the DRDO said.

The DRDO Ventilators

The Government of India, on its twitter handle, released a video of a panel of scientists stating the development of the Ventilator technology. It is a cutting edge tech that the organisation expects to build as a robust product. When it issued an earlier statement, DRDO said that the ventilator will cost around INR 4 lacs. In the last four-five days, they have been able to test the ventilators in Apollo Hospital and certain ESI Hospitals.

COVID-19 affects the respiratory system. Therefore, this technology is a great relief for doctors and nurses all over India. The organisation also stated to release around 5,000 ventilators in the first month and 10,000 subsequently. Bharat Electronics Limited will be the primary vendor.

The Body Suits

DRDO released a statement saying that the bodysuit can shield doctors, medical staff, sanitation workers and others. DRDO initially developed the bodysuit for medical and paramedical staff to manage and evacuate the casualties in the event of radiological emergencies. Due to the evolving pandemic, this suit was later converted to a bodysuit to stop contamination. The suit is washable and has passed the ASTM International standards.

Frontier Protective Wear Pvt Ltd, Kolkata and Medikit Pvt Ltd, Mumbai are producing 10,000 suits per day. These suits cost around INR 7000. These suits will be useful for the frontline fighters against Coronavirus.

The N-99 Masks

The N-99 mask is a five-layer pollution protection mask. As an upgrade, the DRDO has used two layers of nanomesh to make them for medical purpose. The N-99 masks cost INR 75 per piece.

Venus Industries and IMTEC, in Mumbai and Kolkata respectively, are the vendors for this mask. Ahmedabad Textile Industry’s Research Association supplies the cloth for the masks. The latter has a lot of order from the government for N-95 masks.

DRDO has also stated that it will produce 3D masks for police and health workers. The organisation has already produced a large number of surgical masks. It will further mass produce as and when needed.

The Hand Sanitisers

Defence Research & Development Establishment (DRDE), Gwalior is a lab of the DRDO. They initially produced around 20,000 ltrs of alcohol-based sanitiser. Later, the DRDO found a vendor, Gwalior Alco Brew Pvt Ltd. The vendor has a production capacity of 20-30 thousand litres every day. The sanitiser will cost Rs 20 per litre.

The hand sanitiser is the basic weapon against COVID-19. Hence, DRDO has supplied over 9000 ltrs to the following:

- The Indian Armed Forces
- The Armed Forces Medical Corps
- The Defence Security Corps
- The Ministry of Defense
- The Parliament and various high-level offices.

Future Ahead

The DRDO aims to build isolation tents, oxygen-based isolation tubes, sanitisation tanks and sanitizing vans. Dr Sateesh Reddy, Chairman of DRDO stated that they will soon produce Sanitizing Vans in considerable numbers. They will be supplied to major cities and towns for sanitizing people who enter the van. Similarly, he said that DRDO is working on technology relating to isolation tubes.

<https://www.ciol.com/drdo-produce-ventilators-can-used-4-8-patients-n99mask-sanitisers/>

 THE ECONOMIC TIMES

Thu, 02 April 2020

25,000 NCC cadets, retired military health professionals, 8,500 army doctors on standby, while 9000 forces' hospital beds provided for coronavirus outbreak

Indian Air Force Chief Air Chief Marshal RKS Bhaduria told the minister that air force planes have transported about 25 tons of medical supplies within the country in the last five days. Officials added that in the last three days, these supplies were airlifted from Delhi, Surat and Chandigarh to Manipur, Nagaland and the union territories of J&K and Ladakh

By Shaurya Karanbir Gurung

New Delhi: About 25,000 National Cadet Corps cadets and retired military health professionals have been readied to provide assistance to the government to tackle the coronavirus outbreak in India, even as the Chief of Defence Staff and Army Chief on Wednesday said that over 9,000 services hospital beds have been made available and 8,500 doctors and support staff are on standby.

The developments were shared by the Director General Armed Forces Medical Services (DG AFMS) Lieutenant General Anup Banerji, who is responsible to the government for the overall medical policy relating to the forces, and CDS General Bipin Rawat and Army Chief General MM Naravane to Defence Minister Rajnath Singh, who reviewed the defence ministry's assistance to fight COVID-19 through video conference. Navy Chief Admiral Karambir Singh also informed Singh that Naval ships are on standby to extend any assistance.

Indian Air Force Chief Air Chief Marshal RKS Bhadauria told the minister that air force planes have transported about 25 tons of medical supplies within the country in the last five days. Officials added that in the last three days, these supplies, including Personal Protective Equipment (PPE), hand sanitisers, surgical gloves, besides medical personnel, were airlifted from Delhi, Surat and Chandigarh to Manipur, Nagaland and the union territories of J&K and Ladakh.

Singh appreciated the efforts being made by the forces, organisations and Defence PSUs for evacuation, health care in quarantine facilities, and research and production of medical equipment such as sanitizers, facemasks and PPE. “He directed all the organisations to redouble their efforts and work in close coordination with other ministries and organizations of the Central Government in this crucial time,” a defence ministry statement read.

The DG AFMS, who heads the Armed Forces Medical Services (of the army, air force and navy), told Singh said that necessary equipment has been procured and dispatched to various hospitals. “Retired health professionals (read as military) have also been kept in readiness to volunteer their services. Approximately 25,000 National Cadet Corps (NCC) cadets are being mobilised to provide necessary local assistance,” the ministry said.

The CDS informed Singh that separate hospitals have been identified to exclusively deal with COVID-19 and “more than 9,000 hospital beds have been made available”. Over 1,000 evacuees are quarantined at facilities in Jaisalmer, Jodhpur, Chennai, Manesar, Hindan and Mumbai. Their quarantine period will end on April 7.

Naravane informed the minister that, “more than 8,500 doctors and support staff are available to extend necessary assistance to civilian administration,” adding that assistance to Nepal by providing medical equipment will be delivered shortly.

The IAF, on its part, is regularly airlifting COVID-19 test samples from the Union Territory of Ladakh to Delhi. For this, C-17, C-130, An-32, AVRO and Dornier aircraft are being tasked. Medical care to Indian citizens evacuated from Iran and Malaysia is being provided at Air bases at Hindon and Tambaram.

Meanwhile, Defence Research and Development Organisation (DRDO) Chairman Dr G Sathesh Reddy informed Singh that 50,000 litres of sanitizers made by DRDO labs were supplied to different security entities, including Delhi Police, while another one lakh litres were supplied across the country. Reddy said that a five-layered nanotechnology face mask N99 is being made on a war footing. “10,000 have already been made and soon their per day production will be extended to 20,000. DRDO labs have also supplied 40,000 other face masks to Delhi Police. Another DRDO laboratory has also made arrangements to make 20,000 PPE per day,” the ministry said.

<https://economictimes.indiatimes.com/news/defence/25000-ncc-cadets-retired-military-health-professionals-8500-army-doctors-on-standby-while-9000-forces-hospital-beds-provided-for-coronavirus-pandemic/articleshow/74931601.cms>