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War of future! DRDO gets ready with new labs to work on new emerging technologies

For future game-changing technologies there has to be a concentrated effort to support both by intellectual capital as well as financial investments

By Huma Siddiqui

The rapidly evolving technology is challenging the traditional norms of technology assessment and forecasting. Today India is emerging as the nation of Startups and the pace of innovation is such that, the modern-day technology needs to be evaluated and it's future potential ascertained with unimaginable immediacy.

Inspired by Prime Minister Narendra Modi's speech in 2014, DRDO country's premier research organisation has identified five technology areas for challenging research opportunities that would empower the youth. These included Artificial intelligence, Quantum technologies, Cognitive technologies, Asymmetric technologies and Smart materials for the laboratories.

For future game-changing technologies there has to be a concentrated effort to support both by intellectual capital as well as financial investments. "No longer can we wait to assess technology till maturity for implementation and then plan investment. Speed of assessment, rapid prototyping, the pace of evaluation and focused development is necessary for us to stay relevant within the field of new technologies" explained a DRDO official.

Among the five DRDO Young Scientists Labs (DYSL) dedicated to the country by Prime Minister Modi recently one of the labs has been designated to work designing and developing Quantum Computer using superconducting Qubits. This consistent with DRDO may perhaps be the first attempt from India to create a Quantum Computer using Superconducting Circuit based Qubit and can be hosted on a cloud platform for nation-wide access. This is expected to create major opportunities in developing indigenous Quantum Computing resources within the country and will be within easy reach of the people.

Another area identified is Semiconductor Quantum Dot based Qubit Fabrication, Control and Measurement. Semiconductor-based Qubits have shown the potential to bring in scalability within the development of Quantum processors like the major global technological revolution brought about by the development of silicon electronics of the past few decades.

Algorithm development on Quantum simulator: The Quantum Algorithms can have disruptive advantages in various optimization and other security applications.

Feasibility study and demonstration of Quantum entanglement and Quantum Random Number Generator (QRNG): Entanglement is the property by virtue of which two atomic/sub F atomic particles are highly correlated independent of their distances.

https://www.financialexpress.com/defence/war-of-future-drdo-gets-ready-with-new-labs-to-work-on-new-emerging-technologies/1813014/

hindustantimes

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Air Force set to get two more warning systems

The proposal is now before the Cabinet Committee on Security (CCS) and the entire project is estimated to take three years after the apex committee's clearance

By Shishir Gupta

New Delhi: The Defence Acquisition Council (DAC) last month cleared a Rs 9,000 crore joint proposal of the Defence Research and Development Organization (DRDO) and the Indian Air Force to purchase two Airbus 330s and convert them into 360-degree long-range capability Airborne Warning and Control Systems (AWACS), senior officials familiar with the development said on Saturday.

The proposal is now before the Cabinet Committee on Security (CCS) and the entire project is estimated to take three years after the apex committee's clearance.

"The need for more AWACS was acutely felt post the Balakot air strike, with Pakistan being able to deploy its SAAB AWACS 24x7 in the north and south sectors and India being able to cover the two theatres only for 12 hours each day," one of the officials cited above said.

The DRDO has also decided to hand over a third Embraer-mounted Airborne Early Warning system to the IAF (Indian Air Force) to further enhance Indian capability in battlefield theatre. The IAF already has two Israeli PHALCON radars mounted on a Russian A-50 platform and two DRDO-developed radars mounted on Embraer platforms.

According to the proposal cleared by the DAC, the Airbus AWACS will be a 50:50 joint venture between the DRDO and the IAF. Once the aircraft are purchased, the DRDO will mount a 360-degree rotor dome radar along with state of the art communication capability to guide the IAF fighters and attack helicopters in future war theatres, one of the officials cited above said.

The AWACS not only tracks the aerial threat, be it a fighter or a missile, but also guides the counter-response. Had it not been for PHALCON AWACS, the Indian response to the February 27 Pakistani counter-strike would have been weak and the IAF would never have known that Wing Commander Abhinandan had downed a Pakistan Air Force fighter code-named Red Mike on the radar. Whether Red Mike was an American F-16 sold by Jordan to Pakistan or any other fighter is still not confirmed.

https://www.hindustantimes.com/india-news/air-force-set-to-get-two-more-warning-systems/story-KC4gyG7wnY3gfXnl26cqUO.html

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DRDO develops escape chute for fire emergencies

Fire incidents growing in number in cosmopolitan cities has pressed the defence laboratory in New Delhi to develop a 50-metre emergency escape chute

By Pearl Maria D'Souza

Bengaluru: Fire incidents growing in number in cosmopolitan cities has pressed the defence laboratory in New Delhi to develop a 50-metre emergency escape chute. The prototype of the produce which is awaiting its patent was displayed at the Pride of India Exhibition at the five-day Indian Science Congress in Bengaluru on Friday.

The chute, which is designed using fire resistant Kevlar polymer and aluminium alloy rings, can hold up to five tonne weight, and can extend to 50 metres in height, said Mahipal Meena, a scientist and deputy director of Centre for Fire Explosive and Environment Safety of a Defence Research and Development Organisation (DRDO) laboratory based out of New Delhi.

The research and development of the chute began in 2008, he added. The 50-metre tube has smaller cylindrical units. Diagonally places nets in these cylinders make the landing soft as the person gets bounced from one diagonal net to another. The use of chute requires no training and practice, and can be customised for helicopter-based rescue operations during landslides, floods, etc, according to DRDO.

https://www.newindianexpress.com/cities/bengaluru/2020/jan/05/drdo-develops-escape-chute-for-fire-emergencies-2085340.html

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Soldiers growing microgreens at snowy posts

Small plants of cabbage, radish, and fenugreek called microgreens, which are grown over 8-10 days in small dishes of soil and nutrients, can be eaten as supplements, according to scientists from the Defence Institute of High Altitude Research (DIHAR)

By Anonna Dutt

Microgreens, which grow fast and provide leaves and shoots of salad plants, are now being used by soldiers at the Indian Army's snow-covered posts in remote areas, with a presentation on the technique attracting attention at the 107th Indian Science Congress's Pride of India exhibition on Saturday.

Small plants of cabbage, radish, and fenugreek called microgreens, which are grown over 8-10 days in small dishes of soil and nutrients, can be eaten as supplements, according to scientists from the Defence Institute of High Altitude Research (DIHAR), a laboratory of the Defence Research and Development Organisation (DRDO).

"Our research has shown that you will get the same amount of nutrients if you consume 100gm of salad and 10gm of these microgreens. They are nutrient-rich and supplement the micronutrients and vitamins that soldiers living off of tinned food miss out on," said Samar Bahadur Maurya, a participant from DIHAR who was present at the Pride of India exhibition.

Ishi Khosla, who practises as a clinical nutritionist in the national capital, said: "Micro greens are indeed more nutritious than many vegetables. Especially so when people are consuming processed or tinned foods as it fills the nutrient gaps. Processed and cooked foods lose a lot of enzymes and nutrients needed by the body. There is also the functional issue of pH; processed foods are acidic whereas fresh greens are basic in nature, helping in maintaining the balance."

The exhibition comprised displays from about 150 public and private scientific organisations at the University of Agricultural Sciences in Bangalore.

The pavilion set up by the DRDO was inaugurated on Saturday by Union science minister Harsh Vardhan. The outdoor display at the pavilion also showcased long-range surface-to-air missiles and quick reaction surface-to-air missile system among other technologies.

The microgreens do not have to be taken out for sunlight and flourish in the army's barracks, which are warmer than the outdoors at high altitudes. They cannot grow into full-size vegetables as they are planted intensively in soil of very little depth. It is essential that the seeds and the soil are both chemical-free for the plants to grow.

"Since the plants are being consumed so early on in their life cycle, we need to ensure that the seeds and the soil have not been treated chemically. Everything here is organic. Soldiers who stay in the remote outposts usually carry their food once a year and most of it is tinned. This can help balance the sodium levels from the tinned food and provide something fresh," said Maurya, who is a technical officer at DIHAR. The project is headed by Narendra Singh, a scientist at the institute.

A senior army officer familiar with the developments, who spoke on condition of anonymity, said microgreens are being experimented with and could emerge as a good supplement with tinned food in forward areas, provided they are available in good quantities.

The army conducted a pilot programme at some outposts in Ladakh in 2015, followed by several acceptability studies at various locations in the region. “Now, the final kits are being designed in preparation for a mass rollout,” Maurya said.

Microgreens are used across the world usually by chefs at fine-dining restaurants or by nutrition enthusiasts. They first showed up in chefs’ menus in the 1980s in San Francisco, according to the United States Department of Agriculture.

The plants raised by DIHAR researchers are grown indoors, ideally at temperatures between 15° and 20° Celsius. “It can survive even at 10 degrees Celsius but will take a couple of days longer to grow. This temperature is suitably found within the barracks that are kept heated in cold regions. And, as these are indoor plants, they do not need to be taken outdoors for sunlight,” said Maurya.

To grow microgreens, a multipurpose medium made of coconut husk is mixed with inorganic soil additives along with water and other media. “After that, the plant has to be only occasionally watered if it starts drying out. Tending to the plants and having some greenery around also helps with the morale,” he added.

https://www.hindustantimes.com/india-news/soldiers-growing-microgreens-at-snowy-posts/story-GuDWu3W94qWfjPateksYcO.html