

DRDO scientists told to set benchmarks

Baleswar: The 7th DRDO Young Scientists' Meet was held at Chandipur from November 20 to 22 by the Integrated Test Range (ITR).

It was the 7th edition of the annual meet of young scientists from all the laboratories of DRDO spread across the country.

Department of Defence R and D Secretary and DRDO Chairman Dr G Satheesh Reddy inaugurated the event along with Director of ITR Dr BK Das and other dignitaries from DRDO.

Over 250 young scientists who joined the event were engaged in team building activity, group discussion, extempore presentation and technical quiz spanned over three days. Invited talks were delivered by eminent personalities from academia, industry and research institutes.

This edition of YSM was unique in many ways such as launching a dedicated app for ensuring wider reach among the young scientists, conducting online interactions through quiz, opinion polls and discussion forums etc. As a part of ITR's green initiative, no plastic policy was adopted. Moreover, a novel idea of a 'Young Scientists Forest' was conceived where in all the participants, guests and senior officials planted more than 300 fruit bearing plants inside the ITR technical complex to mark the event.

ITR products and technologies were demonstrated in a well-crafted ITR pavilion. The art and culture of Odisha were displayed in stalls demonstrating Patachitra from Raghurajpur and Jaukandehi from Baleswar which proved to be a main crowd puller. Cultural events were also organised after the technical sessions. Eminent Odishi performer Sujata Mahaptra and team presented mesmerizing dance. Besides, renowned standup comedian Praveen Kumar also enthralled the participants and guests with his signature style.

Winners of various competitions were awarded during the valedictory function. In his address Director, ITR Prof Das urged all the young scientists of DRDO to have faith in their potentials and work on innovative and challenging ideas to meet futuristic requirements in the defence sector.

<https://www.dailypioneer.com/2019/state-editions/drdo-scientists-told-to-set-benchmarks.html>

Opinion | DRDO should learn from United States' DARPA so we don't fight tomorrow's war with yesterday's weapons

The annual DARPA budget is a little over \$3 billion, while the DRDO budget is approximately \$2.5 billion. With not much difference in budget, why does DARPA accomplish so much more than the DRDO?

By Lt Gen (Retd) DS Hooda

The October 4, 1957 announcement by Tass, the Soviet Union news agency, of the successful launch of the first artificial satellite Sputnik 1 had caused a great deal of shock to the American people. Proud of their technological prowess, the news had a 'Pearl Harbor' effect on public sentiment. However, notwithstanding all the criticism of the Eisenhower administration, there was also a long-term positive impact. The Sputnik launch spurred a determination in the American leadership to become a world leader in military technology.

One of the first steps undertaken by the US government was the establishment of the Defense Advanced Research Projects Agency (DARPA) in February 1958. According to its website, DARPA works on the principle that the US should be "the initiator and not the victim of strategic technological surprises", and it "explicitly reaches for transformational change instead of incremental advances".

DARPA's achievements have been extremely significant. They include the ARPANET that led to the Internet, stealth technology, microelectronics, sensors for surveillance and reconnaissance, unmanned aerial vehicles, and infrared night vision systems. All these have revolutionised warfighting techniques.

One of the reasons for DARPA's success has been its focus on creating breakthrough technologies and capabilities rather than incremental or evolutionary advances in existing systems. It would, therefore, be instructive to see how DARPA looks at future warfare.

Five months ago, the Tactical Technology Office (TTO) of DARPA asked for proposals for grant of funds for "applied research, advanced technology development, platform demonstrations, or systems studies that aim to enable new warfighting constructs". The TTO note states that the "US military must expand from their historic emphasis on dominance to one of disruptive performance – enabling enhanced capability where needed, applied by a more agile and resilient force."

The note outlines the future capabilities that it foresees in air, ground, maritime, and space systems. While many capabilities are listed out, one area stands out — reducing reliance on monolithic and high-value systems like aircraft, ships, submarines, and space assets. TTO also suggests that "evolutionary advances in traditional stealth technology" in air systems may not be the way forward.

The TTO's vision envisages low-cost, disaggregated, networked systems as a key to disruptive capabilities for future warfare. Let me directly quote from the DARPA document. Under 'Air Systems' it calls for "lethality through a combination of overwhelming performance (e.g. hypersonics) and overwhelming numbers (e.g. swarming low-cost weapons)".

For 'Naval Systems' the capability requirement is for the "proliferation and disaggregation of maritime assets using small, inexpensive, massively-networked vessels derived from commercial designs".

‘Space Systems’ should be based on “proliferating and disaggregating space assets at LEO (low earth orbit), to reduce reliance on GEO (geosynchronous earth orbit) assets — creating smaller, simpler satellites derived from commercial designs, and that leverage the emerging commercial private sector development of network and user segments. Even in ‘Ground Systems’, the focus is on “innovation in mobility and lethality for small units, or even individual warfighters, to enable local dominance”.

It is quite apparent that DARPA's vision for future warfighting focuses on smaller, networked systems rather than the expensive aerial and naval platforms that dominate the battle space today. There is no doubt that the aircraft, the naval destroyer, and the submarine will not lose their relevance in the immediate future, but their importance as a war-winning factor could increasingly come into question.

Saudi Arabia has an extremely advanced air defence system, but it failed to prevent an attack by cheap, low-flying drones and cruise missiles on the Aramco oil processing facility that temporarily cut the country's oil production by half.

In India, despite being the 5th largest defence spender in the world, there is little focus on advanced technologies. Our military technology achievements are the production of mostly outdated tanks, helicopters, and missiles, or the establishment of factories producing foreign weapons after technology transfer.

The army, navy and air force are reluctant to reduce their numbers and are, therefore, procuring platforms or weapon systems that permit them to retain the existing organisational structure. The Defence Research and Development Organisation (DRDO) also focuses on meeting the existing shortfalls of the services rather than future technologies.

The annual DARPA budget is a little over \$3 billion, while the DRDO budget is approximately \$2.5 billion. With not much difference in budget, why does DARPA accomplish so much more than the DRDO? The answer to this lies in the different cultures of the two organisations. DARPA is a funding agency and has no laboratories or research staff. It has an establishment of about 200 persons, of whom half are hired for a three to five-year period. All research is conducted through contracts with universities, industry and government R&D institutions.

The DRDO, on the other hand, has an employee strength of about 30,000 and a network of more than 50 labs. With the running cost of this kind of establishment, it is apparent that only limited amounts would be available for research.

There is no doubt that the DRDO has some impressive accomplishments in developing our nuclear triad at a time when international sanctions were imposed on us. The DRDO also cannot ignore the current equipment requirements of the three services that are saddled with mostly vintage equipment, and the fact that the ‘Make in India’ programme has met with only limited success.

It could also be argued that India's strategic environment and requirements are not comparable to that of the US and that DARPA and DRDO have very different functions. All these are valid arguments but do not take away from the need to focus on future force structures and technologies that will shape the character of wars to come. The military and DRDO must work together with the universities and private industry in a comprehensive effort to research and develop future warfighting technologies so that we don't end up fighting tomorrow's war with yesterday's doctrine and weapon systems.

(The author is former Northern Commander, Indian Army, under whose leadership India carried out surgical strikes against Pakistan in 2016. Views are personal.)

<https://www.news18.com/news/opinion/opinion-drdo-should-learn-from-united-states-darpa-so-we-dont-fight-tomorrows-war-with-yesterdays-weapons-2398997.html>