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Tribute to Scientists

By Dr Sudershan kumar

On 11th May in the year 1998, India achieved a great milestone in the field of science when it successfully conducted the Pokhran tests with an impeccable precision. To commemorate, henceforth this day is observed as the Technology Day since 1998. The success of these nuclear tests on 11th May and 13th May under the name SHAKTI 1998 set the whole world order into a surprise awakening them towards a new powerful India. Consequent to the above accomplishment, India has achieved many historical feats in miscellaneous fields like defence, aerospace, agriculture, education etc. In all of these, the role of science and technology is imperative thus making the Technology Day commemoration and observance even more significant. Numerous events are organized in different technical institutions, engineering colleges to mark the day. These events encompass quiz competitions, lectures, interactive sessions and presentations on various topics of Science and technology. But the role of science and technology is older and even prior to 11 May, 1998 when India had conducted the first nuclear test with code name "Smiling Buddha" in May 1974. The five nuclear tests designated as Pokhran II experiments were based on fission and fusion with fission(thermo nuclear) principles. The first three were conducted on 11th May and the remaining two on 13th May 1998. These tests set the stage for a new powerful nuclear India and ushered in an era of nuclear programme in the country. The then Prime Minister of India Atal Bihari Vajpayee raised the slogan from Pokharn – "Jai Jawan Jai kisaan and Jai Vigyan" further endorsing the role of technology in new India and giving impetus to it. Therefore since 1999 every year country celebrates Technology Day on 11th May.

The Technology Department Board (TDB), on this occasion every year celebrates and recognises various contributions by felicitating those who have pursued and achieved technical excellence and innovation that have caused a positive impact on nature. Hence TDB selects different themes every year. The theme in 2018 was "science and technology for sustainable future". This year, this technology day assumes special significance as Indian scientists from DRDO have sprung the nation to newer heights by successfully testing an Anti Satellite Weapon A-SAT on 27th March 2019. Through this test India was able to shoot down the low earth orbit satellite at an altitude of 270 Km at wee hours of March 27 at Abdul Kalam Island at Odisha coast.

This interceptor missile was a three stage missile with two solid rocket boosters and a kill vehicle (KV) with divert thrusters with weight of 19 tonnes and length 13 meters. The weapon system had tracked, classified and computed a feasible intercept against the live target satellite over the Bay of Bengal. The interceptor missile lifted up from the mobile launcher from Dr. APJ Island complex Dharmare at about 11-10 hrs IST. After the burn out of boosters the kill vehicle (KV) was released and heat shield was ejected. The KV with innovative design and indigenous state of art hit to "kill technology" homed on to the target satellite.

The intercept occurred within 3 minutes from the launch at the height of 280kms and the last frame from the seeker confirmed that the target was hit at the intended aim point. The ground radars picked up the debris as the target and interceptor turned into pieces due to enormous kinetic energy from the target. The missile had the capability to neutralize the target up to the range of 1000kms. However, India as a responsible nation for peaceful use of space, has chosen much lower orbit of 280 kms for the demonstration in order to completely avoid the threat of debris to global space assets including ISS. With this demonstration India has joined the elite class of nations (US, Russia and China) possessing the anti satellite capability. One must applaud the DRDO scientists for this pathbreaking achievement.

This so called “DESI BABY” took India towards new frontiers as it was completely indigenous with not even an iota of dependence on foreign countries.

Besides these modern day technological marvels, everybody is well acquainted with the rich heritage of Indian civilization, which is one of the oldest civilization of the world and has contributed significantly in the field of science and technology. This has been amply acknowledged by world’s renowned scholars/researchers including Albert Einstein. According to Albert Einstein’s words “we owe a lot to ancient Indians, teaching us how to count without which most of modern discoveries would have been impossible”. Ancient Indian science was incredibly advanced as can be seen through the enormous important contributions and numerous discoveries, which clearly reflects that the science in Indian continent at that time was at its peak as compared to that of the rest of the world. Notable discoveries which made Indians proud were creation of symbol Zero by Aryabhata, Chakravata’s method of Algorithm, theory of atom by Kanad (much before the Dalton theory), smelting of zinc, seamless metal globes, plastic surgery, cataract surgery and Ayruveda and many others in different fields of science and technology. Even war’s fought between Kaurvas and Pandavas, and between Lord Rama and Ravana were intense short and highly technology oriented. These wars have been described in depth in two major sanskrit epics Mahabharata and Ramayana.

But knowing the destructive effects and fear of falling in to the hands of Demons (the present day terrorists), scholars and Rishis of that time, who invented those deadly weapons of mass destruction kept the technologies hidden in various religious Granths. Subsequently in last two thousand years Indian sub continent witnessed invasions by various rulers through Afghanistan which culminated with the British establishing the colonial rule in India which extended over a period of 200 years. All these had a detrimental effect on the rich and advanced scientific heritage which is further evident as per the reports which depict that one Lord Macaulay completely dismantled the old age Indian education system. The then British rulers established educational institutions as per their requirements. There was hardly any R&D activity at that time. This further augmented the decimation of rich cultural and scientific heritage of our country. There came a dearth of new discoveries in the field of science and technology. Ironically, the nineteenth and twentieth centuries belonged to western world. It was only after Independence that Indian policy planners envisaged the vision of a scientifically and technologically prosperous India and thus laid the foundation of it. They established large number of academic institutions, IIT’s Department of Atomic Energy (DAE),Defence Research and Development Organisation (DRDO), Indian Space Research Organisation (ISRO) and many others. The scientists of these organisations have taken up the initiative to make India the global hub of innovative technologies. But it all depends on the vision and spine of those , who are at the helm of affairs at the Centre. The author is of the view that it is high time that the authorities must evolve a road map for 50 years ahead keeping in mind the new millennium challenges and work towards that direction in such a way that India emerges as a global super power both militarily and economically.

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NDTV

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Most of debris from Mission Shakti has decayed: DRDO Chief

Whatever couples of pieces are there, they will be decaying in a short period of time, says Defence Research and Development Organisation''s Chairman G Satheesh Reddy

New Delhi: Most of the debris generated from from the anti-satellite test India conducted in March have decayed and rest of it will dissipate in a "short period of time", Defence Research and Development Organisation's Chairman G Satheesh Reddy said today.

He said this in response to a question after delivering a talk on 'Technology for National Security' at the Institute for Defence Studies and Analyses (IDSA), a city-based think tank.

"As I had mentioned on April 6, the debris were to decay in a few weeks time. As per the information that we have already got, most of the debris have decayed. And, whatever, couple of pieces are there, they will be decaying in a short period of time," Mr Reddy said.

The DRDO chief said the continuous information received is being monitored and "I don't think there are any issues".

"It is extremely difficult to predict as to how many days it would take... But, as I had said that day, that they would decay in a few weeks, and majority of them have decayed," he added.

On April 6 at a press conference at DRDO Bhawan, Mr Reddy had said India chose a much lower orbit of less than 300 km during 'Mission Shakti' for "capability demonstration" and to avoid threat of debris to global space assets.

His remark had come days after the National Aeronautics and Space Administration raised concerns about the spread of debris from India's anti-satellite test conducted on March 27.

India's Ministry of External Affairs, too, has said the test was done in the lower atmosphere to ensure that there is no space debris.On another question on leakage of defence know how-related data, he said, "We haven't seen cases as such, but we are careful". "There are no serious issues as such, but of late, because of the apprehensions of cyber attacks and cyber-related issues, we are sensitising people in the industry and also in our own laboratories on it," he said.

https://www.ndtv.com/india-news/most-of-debris-from-indias-anti-satellite-test-mission-shakti-has-decayed-drdo-chief-2035961

Business Standard

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Missile Shakti debris has decayed, says DRDO Chief

New Delhi: DRDO Chief G Satheesh Reddy today said that most of the debris created as a result of A-SAT weapon test has decayed while rest of it is expected to decay in a short while.

Speaking on the sidelines of an event at IDSA, he said, "Mission SHAKTI was intentionally planned at a lower orbit of less than 300 km, well below the orbit of any global space asset, to avoid the threat of debris. The debris created after the mission is continuously being monitored."

A-SAT used ballistic missile technology for hitting the target, the interceptor was based on hit to kill mode. No warheads or explosion was used to neutralise the satellite.

The A-SAT is a 3 stage 19 tons vehicle, guided by divert and altitude control system and terminal guidance system and other technologies all of which are indigenously developed. Reddy talked about emerging battlefield scenario in space, cyberspace, sea, land and air and thrust areas for future, like the development of underwater vehicles, underwater propulsion system and hypersonic missile engine.

Previously NASA had termed Mission SHAKTI as unacceptable and said: "This is terrible, terrible thing to create an event that sends debris in an apogee that goes above the International Space Station."

In a major defence achievement, India on March 27 had successfully tested an anti-satellite missile by shooting down its own decommissioned satellite that was on a 'Low Earth Orbit' at a height of 300 KM from the earth's surface. Making the announcement about the test, Prime Minister Narendra Modi had said that India's feat is only for its own defence needs and not for use against any country. He also reiterated that India was against arms race in outer space.

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