

U.S. Air Force's new radar system detects breakup field from India anti-satellite test

U.S. Air Force's new radar system plays a vital role as space becomes more congested and contested with satellites and orbital debris, according to the news release put out by Lockheed Martin.

The aerospace giant reported U.S. Air Force's Space Fence system detected the breakup field from an anti-satellite test conducted by India during a scheduled endurance exercise of the new space surveillance radar.

As MICROSAT-R was expected to pass through the un-cued surveillance fence, Space Fence automatically issued a "breakup alert" indicating there were multiple objects within close proximity. Space Fence observed a significant amount of debris tracks surrounding the time of the event crossing labeled as uncorrelated targets. Long-arc tracking was initiated within the orbital debris cloud to form accurate initial orbit determinations. With this information, the system was able to automatically predict and correlate the next crossing time.

Lockheed Martin (NYSE: LMT) system operators then prepared for the next crossing by setting up an enhanced sensitivity task volume ahead of the normal un-cued surveillance fence to increase the low altitude track duration. Although the Space Fence is currently in its test phase and not yet operational, the Space Fence un-cued surveillance coverage showed its unique ability to observe these events unfolding at different altitudes in real time. Although the anti-satellite test was conducted at approximately 300 kilometers, the debris cloud extended beyond the original parent object orbit.

"Although the Space Fence system is still under test, it continues to demonstrate its advanced capabilities providing operationally-relevant information in all orbital regimes from Low Earth Orbit through Geosynchronous Earth Orbit," said Dr. Rob Smith, vice president and general manager of Radar and Sensor Systems for Lockheed Martin. "The criticality of space assets to both national defense and the world economy cannot be understated. As multiple new mega constellations consisting of thousands of satellites become a reality and the space domain continues to become more congested, the demand for more accurate and timely space situational awareness data will be of the utmost importance to the warfighter."

The Space Fence system continues to track objects from the anti-satellite event through the government-led testing phase which began in early April.

Colonel Stephen Purdy, Director of the Space Superiority Systems Directorate, Space and Missile Systems Center, Los Angeles Air Force Base, who oversees the Space Fence program said, "Space Fence is already proving itself as a capable system even before becoming operational. The Indian test showcased Space Fence's capabilities in a real-world event. The system was able to quickly respond to a highly dynamic situation providing critical data. Space Fence is the latest in a long line of capabilities we are collectively bringing to the warfighter as we continue to build out space capabilities for the United States."

<http://www.defencenews.in/article/US-Air-Force%e2%80%99s-new-radar-system-detects-breakup-field-from-India-anti-satellite-test-584839>

Meet Ipsita Biswas, scientist who developed non-lethal plastic bullets

A rising number of women are opting for career in science and research. Beginning today, Hindustan Times starts a new weekly column on women scientists of tricity. Featured first in the ten-part series is Ipsita Biswas, a scientist at the Terminal Ballistics Research Laboratory

By Aakriti Sharma

Chandigarh: It pierced her heart, the picture of a young girl's face disfigured with pellet injuries that surfaced on social media after clashes between Kashmiri residents and Army personnel over the killing of militant group Hizbul Muhahideen commander Burhan Wani in 2016. Pellets, also known as riot control ammunition, were being widely used to control crowds.

However, after coming under fire for grievous injuries caused to civilians in Jammu and Kashmir (J-K) by the pellets, the Union home ministry had set up a panel to come up with a non-lethal alternative to the pellets to control riots.

This was how plastic pellets were developed and tested by scientist Ipsita Biswas, 57, and her team at the Terminal Ballistics Research Laboratory (TBRL), Chandigarh, under Defence Research and Development Organisation (DRDO) in just one-and-a half years.

"I work with life-saving devices and that too for our forces. If somebody saves a little bird, that is in itself a good feeling and when I work to build armour for the forces responsible for our protection, it comes with a responsibility and feels great," she says.

Proud of her team's work, Biswas points out that the plastic bullets are non-lethal and serve as a means to disperse crowds. No special weapon is required to fire them and AK 47's work just fine, which 70% of the Indian Army is equipped with. Unlike a pellet (burst), only one plastic bullet is released at a time and hits the area of target. Since the speed of the bullet decreases as it nears the target, it reduces fatalities," she says.

A scientist with 20 years standing, Biswas heads three technical divisions at TBRL, which she joined in 1998 when she came to Chandigarh. She leads a team of 10 scientists in areas of test and evaluation of life saving devices, characterisation of armour material and more.

Conferred with the Narishakti Puruskar in March 2019 by President Ram Nath Kovind for her contributions to the army and paramilitary forces, Biswas is currently working on frangible bullets, a specific application for sky marshals, which crumbles to pieces when it strikes something harder than itself with no damage to the aircraft in the case of a hijack attempt.

Even though she's from a family of engineers, Biswas, who loves math, had always wanted to pursue research and development. After completing her postgraduate degree in applied mathematics from Jadavpur University, Kolkata, in 1988, Biswas did not pursue a PhD because she had filled a job application for DRDO and "in the first shot in 1988, right after my postgraduation, I got the job at DRDO in Delhi after an interview," she says.

She took up the chance immediately as her parents thought it was a good opportunity. "So I did not go anywhere else, not even for UGC interview," says Biswas, who was born and brought up in Kolkata.

Driven by curiosity and indulged in developing life-saving devices, Biswas has been evaluating bullet-proof jackets and mine protected vehicles for the armed forces and paramilitary jawans. "Working on it for over 10 years, a partially completed project still requires work on bullet-proof

helmets. Helmets are crucial because head injury can kill a person. So it is more important to come-up with a successful bullet-proof helmet,” she says.

About challenges, Biswas says usually women are perceived as being unable to do complicated jobs as they don't want to shift their focus from their families. “Women understand science just as well as men but the demands of a job in science and research leads to problems in families as women are expected to work during certain hours, only after finishing household chores,” she says.

That's why balancing everything is important, says Biswas, who stays up till late to finish her reading, both personal and work-related, after her family has gone to sleep. “I don't mix the two. I find time for my studies somewhere in between.”

Asked whether the glass ceiling exists in her field of work, Biswas says, “the younger generation of women does not have to worry about it because we have done it for them. We have faced the biases and taboos around women in science and now everyone knows that women know and understand science equally well. They just have to explore now. Every profession has its hurdles but if you are driven, there is no limit,” she says. “There is no limitation to opportunities for women.” What's her Eureka moment? “It is yet to come” she signs off with her signature modesty.

Biswas, who prefers reading Bengali books and is also a Harry Potter fan, finds her inspiration in Dr APJ Abdul Kalam. She says she met him when he was working in DRDO and admired him for his work and simplicity.

<https://www.hindustantimes.com/punjab/ipsita-biswas-scientist-at-tbri-more-hits-than-misses/story-XckCsHioqPHFo2i7VzXrXK.html>