

DRDO: Achievements and Way Ahead

India started her defence programme by forming the Defence Science Organization, an institution with the goal of researches in defence science in 1948. The Defence Research and Development Organization, DRDO was founded on January 1, 1958 under the ministry of defence by merging Defence Science Organization and establishments of the three services units with a goal of making India second to none in the field of defence science and technology. There was a need of advancement in the defence sector after the independence as our neighbours were arming drastically and foreseeing its future consequences, prime minister of that period Pandit Jawaharlal Nehru and his defence minister, Shri VK Krishna Menon paved the way to the formation of DRDO. The motto of DRDO, *Baalasya Moolam Vigyanam*, which means "Strength's Origin is in Science" is very much congruent to its activities.

The DRDO is responsible of the all defence related activities in our country such as designing and testing of armaments, ammunition, aircraft, armored vehicles etc. those are developed indigenously. The standardization of defence equipment and stores are also carried about by the DRDO. The DRDO is supported by a set of coordinated institutions for the development in separate fields of defence, such as Armament Research and Development Establishment, Pune; Naval Physical and Oceanographic Laboratory, Kochi etc. These organizations work on their field of excellence to make their contribution to the nation. It has got about 50 laboratories across India with a mission to attain India technologically self-reliance. It has a got man power of almost 30,000 people working under these institutions.

Today DRDO carries out different activities related to aeronautics, missile engineering, combat vehicle engineering, surveillance systems etc. Defence Science Organization Started off with the development of ballistics and operation research it grew into an advanced defence research institution under DRDO. The nation made a huge leap in its defence sector under DRDO in the first decades itself. It developed communication systems, explosives etc. during the first decade. DRDO grew as it developed defence equipment such as sonars, radars, aeronautical systems etc. During the 80's DRDO developed low level surveillance radar *Indra*. During the last decade of 1900's it was able

to create missiles like *Agni* and *Prithvi*. Also ballistic tank *Arjun* was developed which was a great achievement in the field of defence. *Lakshya* is a pilotless aircraft developed by DRDO for the Armed Forces. Since Unmanned Aerial Vehicles play a huge role in present situations, this was a huge achievement. The light combat vehicle(LCA) was developed by Aeronautical Development Authority(ADA).

The DRDO has also has also developed and deployed sonar systems like *Simhika*, *Humsa*, *Humvad* etc. The another major achievement of DRDO was the development of *PACE+*, a supercomputer. It was developed indigenously after the frequent denial from other super powers to transfer of technology.

The missile programme started with the inception of project *Indigo*. It led to the next mission, project *Devil*. *Prithvi* was the first missile developed under the IGMDP in 1980.India made its missile programme a success as DRDO developed surface to surface missiles such as *Agni* and *Prithvi* which were short range ballistic missiles. Later *Agni-II* was developed which was a long range ballistic missile. Surface to air missiles like *Akash* and *Trishul* were later developed by DRDO. *Nag* was the first anti-tank missile of India and was developed indigenously. The development of bullet proof, jacket *Jackal M-1* was another step towards the self-reliance in defence sector. The development of Impressed Current Cathodic Protection technology by DRDO is used for protecting under water structures. This was one of the development related to the naval engineering. Also the hydrophone system developed by the DRDO was used during the Gujrat earthquake. It helped in the rescue operations by detecting the victims under the remains.

The DRDO has got many test facilities across the country in order to test and standardize the developed resources. The facilities are for the purpose like range test, electronic warfare and evaluation, flight simulation, underwater research etc.

The Organization has collaboration with different academic institutions in order to provide better facilities with a vision to bring out new talents. It has established centers in IIT, Mumbai where it has aerospace system and design engineering.

Also different support facilities include a number of industries across India providing assistance to DRDO. These include industries like *Bharat Dynamic Limited (BDL)*, a facility for developing missiles under Integrated Guided Missile Development Programme (IGMDP). *Hindustan Aeronautics Limited (HAL)* is another major facility for the

development of missiles under IGMDP. Advanced Research Centre International (ARCI) is a joint programme by India, Russia, Ukraine and the United States. This facility is used for researches in the field of powder metallurgy.

Today DRDO has developed a range of defence equipment in an advanced manner. Apart from ballistics, surveillance equipment like Netra which is an autonomous UAV. These are used by the BSF for surveillance of the borders. Lakshya is a remotely controlled target drone developed by the Aeronautical Development Establishment (ADE). It is being used by the three units of the Services. Another major achievement of DRDO is the development of Rustom, an Unmanned Aerial Vehicle. It is equipped with cameras and other surveillance system. The primary objective is to give information about the enemy territory. Rustom-II is being developed as a combat equipment.

Pinaka is a multiple rocket launcher developed by the DRDO which was used during the Kargil War.

The one of the most important project of DRDO was the BrahMos missile project. It is a joint collaboration of DRDO and NPOM of Russia. Dr. APJ Abdul Kalam, the advisor to the Minister of Defence at that time signed the agreement. The BrahMos Aerospace Limited made the BrahMos supersonic cruise missile. The variant of BrahMos is under development as BrahMos-II which is a hypersonic version of BrahMos-I.

As DRDO celebrates its 60th anniversary, it is a prestigious moment for all us Indians. DRDO represents self-reliance in development and it shows the rest of the world that our country is second to none in any field of science. As the soldiers guard our beloved country, DRDO is supporting their efforts by providing better equipment and defence systems. It also promotes the concept of make in India initiative as we produce our defence systems indigenously. Within 60 years DRDO has shown the world that India could achieve anything in the field of science. Now DRDO is being concentrated on developing futuristic weapon technologies and development. Nakshatra is an example of this movement.

As DRDO celebrates 60 years of achievements it is a mile stone in Indian history. It brings out a lot of respect to our nation and it reminds our coming generations that we have to go on and on like this for the times to come.