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DRDO TESTS HYPERSONIC TECHNOLOGY DEMONSTRATOR VEHICLE

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DRDO TESTS HYPERSONIC TECHNOLOGY DEMONSTRATOR VEHICLE

India enters into the hypersonic regime paving way for advanced hypersonic Vehicles

DRDO successfully demonstrated the hypersonic air-breathing scramjet technology with the flight test of Hypersonic Technology Demonstration Vehicle (HSTDV) from Dr APJ Abdul Kalam Launch Complex at Wheeler Island, off the coast of Odisha on 7 September 2020.

The hypersonic cruise vehicle was launched using a proven solid rocket motor, which took it to an altitude of 30 km, where the aerodynamic heat shields were separated at hypersonic Mach number. The cruise vehicle separated from the launch vehicle and the air intake opened as planned. The hypersonic combustion sustained and the cruise vehicle continued on its desired flight path at a velocity of six times the speed of sound, i.e., nearly 2 km/s for more than 20 s. The critical events like fuel injection and auto ignition of scramjet demonstrated technological maturity. The scramjet engine performed in a text book manner.

The parameters of launch and cruise vehicle, including scramjet engine was monitored by multiple tracking radars, electro-optical systems and Telemetry Stations. The scramjet engine worked at high dynamic pressure and at very high temperature. A Ship was also deployed in the Bay of Bengal to monitor the performance during the cruise phase of hypersonic vehicle. All the performance parameters have indicated a resounding success of the mission.

Congratulations to @DRDO India for successful flight of the Hypersonic Test Demonstration Vehicle today. The scramjet engine developed by our scientists helped the flight achieve a speed 6 times the speed of sound! Very few countries have such capability today.

— Narendra Modi (@narendramodi) September 7, 2020

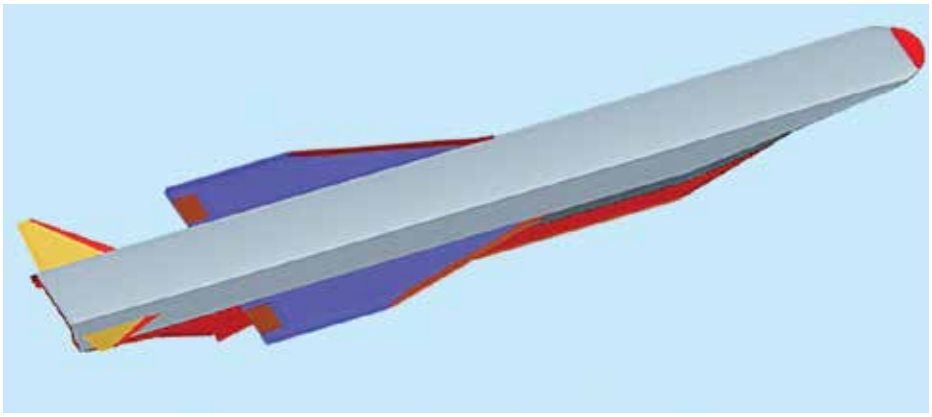
Many critical technologies such as aerodynamic configuration for hypersonic manoeuvers, use of scramjet propulsion for ignition and sustained combustion at hypersonic flow, thermo-structural characterisation of high temperature materials, separation mechanism at hypersonic velocities etc. were proven during the testing.

Prime Minister Shri Narendra Modi in a tweet congratulated DRDO for the stupendous success. Raksha Mantri Shri Rajnath Singh spoke to the scientists associated with the project and congratulated them on this great achievement towards realising Prime Minister Narendra

HSTDV Vehicle—Ready for launch

Modi's vision of Atmanirbhar Bharat. India is proud of them, he added.

Secretary Department of Defence R&D and Chairman DRDO Dr G Satheesh Reddy congratulated all the scientists, researchers and other personnel related with HSTDV mission for their resolute and unwavering efforts towards strengthening nation's defence capabilities.



HSTDV Cruise Vehicle ☞

MAKE IN INDIA

MOD SIGNS CONTRACTS WORTH ₹ 2580 CR WITH INDIAN COMPANIES FOR SUPPLY OF PINAKA REGIMENTS TO INDIAN ARMY

Providing further boost to the 'Make in India' initiative of Government of India in the Defence Sector, Acquisition Wing of Ministry of Defence (MoD) signed contracts with M/s Bharat Earth Movers Ltd (BEML), M/s Tata Power Company Ltd (TPCL) and M/s Larsen & Toubro (L&T) for supply of six Pinaka Regiments to the Regiment of Artillery of the Indian Army at an approximate cost of Rs 2580 Crores. These six Pinaka Regiments would comprise 114 Launchers with Automated Gun Aiming & Positioning System (AGAPS) and 45 Command Posts to be procured from M/s TPCL and M/s L&T and 330 vehicles to be procured from M/s BEML. These Regiments would further enhance the operation preparedness of the Armed Forces. The induction is planned to be completed by 2024.

Pinaka (file photo)

This project under Buy (Indian) categorisation, with 70 per cent indigenous content, has been approved by Raksha Mantri Shri Rajnath Singh and Finance Minister, Smt Nirmala Sitharaman.

The Pinaka Multiple Launch Rocket System (MLRS) has been indigenously designed and developed by DRDO and productionised by the above mentioned defence industries. This is a flagship project showcasing public private partnership under the aegis of Government of India enabling "Aatmnirbharta" in cutting-edge Defence technologies.

LASER GUIDED ANTI-TANK GUIDED MISSILE TESTED SUCCESSFUL

Laser Guided Anti-Tank Guided Missile (ATGM) was successfully test fired from MBT Arjun Tank at KK Ranges, Armoured Corps Centre and School (ACC&S) Ahmednagar on 22 September 2020. The ATGM successfully locked and tracked the target at 3 km with the help of laser designation to ensure precision hit. The missile employs a tandem HEAT warhead to defeat Explosive Reactive Armour (ERA) protected armoured vehicles. It has been developed with multiple-platform launch capability and is currently undergoing technical evaluation trials from gun of MBT Arjun.

Armament Research & Development Establishment (ARDE) Pune in association with High Energy Materials Research Laboratory (HEMRL) Pune, and Instruments Research and Development Establishment (IRDE) Dehradun has developed the missile.

Secretary DDR&D and Chairman DRDO Dr G Satheesh Reddy congratulated DRDO personnel and industry on the successful test firing.

ABHYAS UNDERGOES FLIGHT TEST

DRDO successfully carried out flight test of High-speed Expendable Aerial Target (HEAT), Abhyas, from Integrated Test Range (ITR), Balasore on 22 September 2020. Two demonstrator vehicles were successfully test flown during the trial. The vehicle can be used as target for evaluation of various missile systems. Abhyas is designed and developed by DRDO's Aeronautical Development Establishment (ADE), Bengaluru.

The air vehicle was launched using twin under slung booster. It is powered by a small gas turbine engine and has MicroElectroMechanical (MEMS)-based Inertial Navigation System (INS) for navigation along with the Flight Control Computer (FCC) for guidance and control. The vehicle is programmed for fully autonomous flight. The check out of air vehicle is done using laptop-based Ground Control Station (GCS).

The user requirements of 5 km flying altitude, 0.5 Mach of vehicle speed, 30-minute endurance and 2 g turn capability of the test vehicle were successfully achieved in test.

POSTAGE STAMP RELEASED ON A-SAT: INDIA'S FIRST ANTI SATELLITE MISSILE

A Customized My Stamp on India's Anti Satellite Missile launch was released by Department of Posts on the occasion of Engineers Day on 15 September 2020 in the august presence of Shri Ajit Doval, National Security Advisor (NSA), Dr G Satheesh Reddy, Secretary DDR&D and Chairman DRDO and Shri Pradipta Kumar Bisoi, Secretary, Department of Posts.

On the direction of Hon'ble Prime Minister Shri Narendra Modi, DRDO successfully conducted an Anti-Satellite (A-SAT) missile test 'Mission Shakti' from Dr APJ Abdul Kalam Island in Odisha on 27 March 2019. A-SAT Missile successfully engaged an Indian orbiting target satellite in Low Earth Orbit (LEO) in a 'Hit to Kill' mode. The interceptor missile was a three-stage missile with two solid rocket boosters. The mission

met all its objectives. The entire effort was indigenous, which demonstrated nation's capability to develop such complex and critical missions. A number of industries also participated in the mission. With this success, India became fourth nation in the world to possess such capability.

Shri Ajit Doval in his address stated that it was a very brave step on part of DRDO to go for Mission Shakti. He further stated that DRDO has plenty of achievements to be proud of, however the future is in space-based technologies. Satellites are critical and with this capability India can defend its assets in space. He appreciated the way in which the mission was kept a secret and complimented the whole DRDO fraternity for doing well in all other fields.

Speaking on the occasion, Dr G Satheesh Reddy thanked Hon'ble Prime Minister and NSA for having confidence in DRDO and assigning such a critical and complex mission to DRDO. He further stated that A-SAT mission enabled development of many technologies and capabilities for precision kill at higher altitudes. He called upon DRDO fraternity to take up more such complex and critical projects.

The function was also attended by senior scientists of DRDO. The release of stamp reminded the nation about the technological achievement, which has made the nation proud.

Release of My Stamp on India's Anti Satellite Missile launch

INDEPENDENCE DAY CELEBRATIONS

Defence Materials Research laboratory (DMRL), Hyderabad, celebrated 74th Independence Day with patriotic fervour. Dr G Madhusudhan Reddy, Outstanding Scientist & Director, DMRL hoisted the national flag and briefed about the progress of the laboratory during the year and the achievements in various work areas and projects. He also outlined the various events conducted and number of welfare measures undertaken during the year. He emphasised the need to strive hard for developing material solutions for the defence forces of the country.

Center for Artificial Intelligence and Robotics (CAIR), Bengaluru, celebrated 74th Independence Day with nationalist feelings. The function started with flag hoisting by Dr UK Singh, Outstanding Scientist & Director, CAIR followed by National Anthem. Director, CAIR distributed Merit Awards to the wards of CAIR employees.

Dr G Madhusudhan Reddy, Director, DMRL hoisting the flag on the occasion of Independence Day

Meritorious wards of CAIR employees being awarded Merit Certificates by Dr UK Singh, Director, CAIR

DG (HR) INAUGURATES ONLINE E-EDUCATION PORTAL–DEEKSHA

Defence Scientific Information and Documentation Centre (DESIDOC) has developed an online education platform 'DRDO e-Education and Knowledge Sharing (DEEKSha)' for online organization of CEPs, training programmes, invited lectures interactively. The portal was inaugurated virtually by Dr KS Varaprasad, Distinguished Scientist and DG (HR), DRDO on 15 September 2020 in the presence of Dr Alka Suri, Director, DESIDOC. The portal is based on Modular Object-Oriented Dynamic Learning Environment (MOODLE) an open-source platform.

The portal while interactively providing training programs, offers facilities like live video lectures, online study materials, quiz, assignments, chat-rooms, blogs to have live classroom experience.

ONLINE COURSE ON CHANGING TRENDS OF INFORMATION

DESIDOC organized a four-day online course on "Changing Trends: Forms of Information and Knowledge in Libraries" under Continuing Education Programme (CEP) of DRDO during 15-18 September 2020. The CEP was hosted through DRDO e-Education and Knowledge Sharing (DEEKSha) portal. Eminent speakers from various departments of Library & Information Science delivered the lectures. The course also included interactive sessions and an online quiz. Seventy participants from various DRDO labs attended the course.

HOMAGE TO DR APJ ABDUL KALAM (15 OCTOBER 1931-27 JULY 2015)

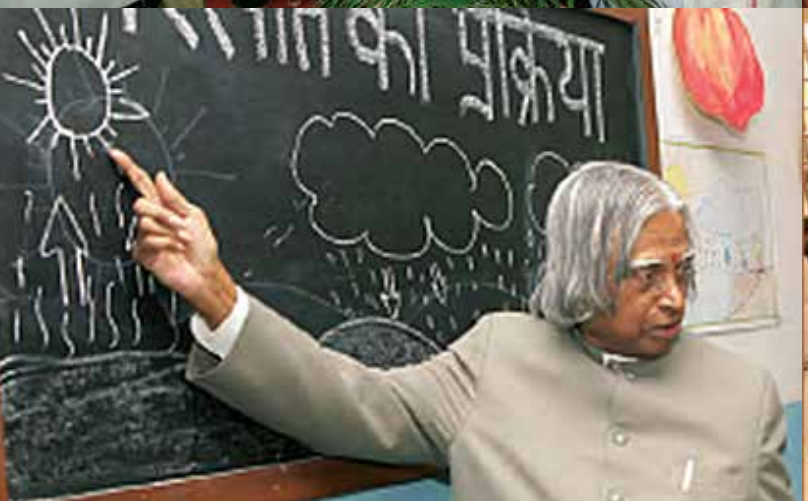
The People's President of India was born in Rameshwaram on 15 October 1931. A strong votary of indigenization, Dr Kalam dreamt of a strong and self-reliant India. His contribution along with Dr Chidambaram of the Atomic Energy Commission, to the Shakti nuclear tests helped us becoming a nuclear weapons state. Dr Kalam served as Scientific Adviser to the Raksha Mantri and as Secretary, Department of Defence Research & Development and DG DRDO from July 1992 to December 1999 where he successfully led India's nuclear capable Guided Missiles Programme. For his stupendous success, Dr Kalam got the sobriquet of The Missile Man of India. DRDO Newsletter, pays a pictorial tribute to the Bharat Ratna on his Birth Anniversary.

Scientist par Excellence

Clockwise from top left: Dr APJ Abdul Kalam with Dr Vikram Sarabhai; at the launch of Agni 1; and with the then PM Shri Atal Bihari Bajpai after the successful operation Shakti at Pokhran

The Commander in Chief

Igniting Young Minds



The Music Connoisseur

DMRL GETS NABL ACCREDITATION AS TESTING & CALIBRATION LABORATORY

Defence Metallurgical Research Laboratory (DMRL), Hyderabad has been accredited in accordance with the standard ISO/IEC 17025:2017 General Requirements for the Competence of Testing & Calibration Laboratories for its facilities at Kanchanbagh, Hyderabad in the field of Calibration from 6 February 2020 to 5 February 2022 and in field of Testing from 26 March 2020 to 25 March 2022.

The NABL Accreditation has been accorded for 51 parameters of measurement in testing & calibration. In addition, the licence for certification of Quality Management System (QMS) of DMRL as per ISO 9001:2015 standard has been extended from October 2019 to October 2022. DMRL is now ISO 9001: 2015 certified for another three years.

National Accreditation Board for Testing and Calibration Laboratories

CERTIFICATE OF ACCREDITATION

DEFENCE METALLURGICAL RESEARCH LABORATORY

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

DRDO, MINISTRY OF DEFENCE, P.O. KANCHAN BAGH, HYDERABAD, TELANGANA, INDIA

in the field of

CALIBRATION

Certificate Number: CC-3108

Issue Date: 06/02/2020 Valid Until: 05/02/2022

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.

(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Signed for and on behalf of NABL

N. Venkateswaran
Chief Executive Officer

PERSONNEL NEWS

APPOINTMENT

CHAIRMAN, CEPTAM

Shri R Appavuraj took over charge of Chairman, Centre for Personnel Talent Management (CEPTAM), Delhi, w.e.f. 22 June 2020. Prior to this he was OS and Director, Proof and Experimental Establishment (PXE), Chandipur from October 2012 to March 2018.

Shri Appavuraj graduated from MIT Chennai in 1982 and post graduated from IIT Chennai in 1984. He joined DRDO in the year 1986 after 2 years of service in IIT, Chennai as Project Associate, where he developed simulation model for high speed centrifuge stability problem (ARDB Project).

At PXE, he undertook many development programmes that included Shell deformation analysis using video data; New Firing Point for Tank firing; Arjun Gun Mount; state-of-the-art real-time Display in Command Posts; Installation and Testing of ICSS Systems; Simulation Models for Artillery Shells; Indigenization of Shell Tracking Radar; Software for Firing programme, Data Analysis & various R&D projects with academics; Up gradation of Range Tracking System; Barrel Displacement Analysis; Modernization of the Range in all aspect; Introduction of Flight Follower System; and Introduction of High Speed IR System.

During his tenure, many safety critical firing trials like Thermo Boric Ammunition, Penetration-cum-Blast (PCB) trials, High Explosive firing against De-commissioned Tank and accident investigation trials for

Arjun Barrels were conducted. Many indigenous weapon systems like Dhanush gun, ATAG gun, modified 130 mm Artillery gun, naval guns and ammunition like FSAPDS, BMCS, UMCS, ERA and indigenous fuzes were evaluated. Novel experimental methods like Background Oriented Schlieren (BOS) technique for range application were successfully developed, and various type of armoured materials including privately manufactured armoured plates were evaluated under his guidance and leadership. Besides, more than 22,000 shells were tested annually and their results handed over to the users that included foreign agency through DGQA.

As Director, Integrated Test Range (ITR), Chandipur from September to October 2016, he ensured smooth conduct of A4, Nirbhya and other weapon system trials.

As scientist in ITR Chandipur during 1990-2012, Shri Appavuraj as Chief of Safety, ensured safe launch practice of various complex missile system trials from various launch complexes and implemented DGPS survey methodology and calibration of Range sensors using DGPS.

He is instrumental in development of state-of-the-art Multi Sensor Data Fusion System, RTFLEX for Real-Time Flight Safety Decision which is patented. He further standardized survey methodology using WGS-84 Model. As DPD (PJ-10) BrahMos, he co-ordinated with Russian scientists for smooth/safe conduct of more than 20 launches from land, ship and mobile launchers. He played a key role to set up Aerial Target System for Akash missile evaluation and other related trials, and has established new launch pad facilities for LRSAM, BrahMos & AD missile systems.

As Scientist 'B' in DRDL/RCI (October 1986 to October 1990), he actively participated in Hardware- in-Loop simulation of Prithvi, Agni, and Trishul missile systems.

He has published 10 papers in reputed journals and presented more than 20 papers in national/ international conferences. He was Guest Editor of the special issue of Defence Science Journal on Development in Test & Evaluation of Armaments.

For his outstanding contributions Shri Appavuraj has been awarded Scientist of the Year Award-2012, Best Performance Award-2010, other Lab Awards and team awards by DRDO HQ.

DIRECTOR, DIPAS

Dr Rajeev Varshney, Sc 'G', has taken over as Director, Defence Institute of Physiology & Allied Sciences (DIPAS), Delhi, with effect from 1 September 2020. He was Associate Director and Head Technology Management Division, prior to assuming the charge of Director. Before moving to DIPAS, he served as Director, Technology Support & Management in the office of Secretary Department of Defence R&D and Chairman DRDO.

Dr Varshney is a Postgraduate in Biochemistry from Aligarh Muslim University and PhD from Jawaharlal Nehru University, New Delhi. He has successfully contributed towards the Development of Mechanism-based Drugs for countering radiation injuries. He has been awarded DRDO Lab-level Technology Group Award and the Young Scientist Award (twice) for presenting his work at Japan and Italy.

Dr Varshney has contributed towards seamless transfer of 16 technologies developed at DIPAS through LAToT agreements with 50 industries for bulk production and induction of products with users. He played a pivotal role in establishing DIPAS as one of the leading Covid-19 testing laboratories in the country.

He has served as an Expert Member of DST and ICMR Project Advisory Committee for funding and is a Member of National Academy of Medical Sciences. He has published several papers in national and international journals of repute.

HIGHER QUALIFICATION ACQUIRED

Shri Neeraj Chaurasia, SSO-I, ORDAQA (GW&M), DRDL, Hyderabad has been awarded PhD in Mechanical Engineering by Maulana Azad National Institute of Technology (MANIT), Bhopal for his thesis entitled "Optimization of Duct Design of Equipment Bay Cooling System of Fighter Aircraft." He developed a new formula for the friction factor of the duct design of the cooling system of the equipment bay in the aircraft.

READERS' FEEDBACK

(Your feedback is important to us as it gives scope for improvement and serve the Organisation in a better way)

1. **Name of the Establishment:**_____

2. **How would you rate the *DRDO Newsletter* as a medium to adequately present DRDO developments?**

   Excellent ☐ Very Good ☐ Good ☐ Fair ☐ Satisfactory ☐

3. **How would you rate the technical contents of the *Newsletter*?**

   Excellent ☐ Very Good ☐ Good ☐ Fair ☐ Satisfactory ☐

4. **How would you rate the quality of photographs in the *Newsletter*?**

   Excellent ☐ Very Good ☐ Good ☐ Fair ☐ Satisfactory ☐

5. **Ideal number of pages you would like for the *Newsletter*?**

   8 Pages ☐ 12 Pages ☐ 16 Pages ☐ 20 Pages ☐

6. **In which format do you prefers the *Newsletter*?**

   Print ☐ E-pub ☐ Video magazine ☐

7. **When are you receiving the *Newsletter*:**

   In the previous month of publishing ☐ In the same month of publishing ☐

   In the next month of publishing ☐

8. **Suggestions, if any, to further improve the technical content of the *Newsletter*?**

   _____

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Please send your suggestions to:

The Editor, DRDO Newsletter, DESIDOC, DRDO, Metcalfe House, Delhi - 110 054

DRDO HARNESSING SCIENCE FOR PEACE & SECURITY

CHAPTER 4: MARCHING FORWARD

The article is 55th in the Series of extracts of the monograph, "Defence Research & Development Organisation: 1958-1982", by Shri RP Shenoy, former Director of Electronics and Radar Development Establishment (LRDE).

VEHICLES

There are two major establishments under this discipline and these are, Vehicles Research & Development Establishment (VRDE) and the Combat Vehicles Research & Development Establishment (CVRDE).

Vehicles Research & Development Establishment

VRDE was formed out of TDE (Vehicles), Ahmednagar, in 1965 as a result of the separation of R&D and inspection activities. Within a short period, that is in 1966, DRDO decided to station a team from VRDE, at Avadi where the Heavy Vehicles Factory (HVF) was situated, for production of tanks for the Army with collaboration from Vickers of UK. The DRDO nucleus was to assist the HVF team in their absorption of technology from Vickers with the necessary R&D backup. In a very short time, the responsibilities of the R&D team from VRDE at Avadi went beyond design and development issues and extended to trial evaluation, not only of Vijayanta tank but also of other fighting vehicles handled by the Indian Army. By 1969, the involvement of the VRDE detachment at Avadi thus changed to a long time commitment to take up design, development and evaluation of fighting vehicles for the Indian Army. The detachment was made into an independent laboratory in 1969 and was renamed in 1976 as the Combat Vehicles Research & Development Establishment (CVRDE). A clear demarcation of areas of work was made so that design, development and evaluation activities of wheeled vehicles would be at VRDE, Ahmednagar and the design, development and evaluation of all tracked vehicles would be shouldered by CVRDE, Chennai.

In the automobile sector, the basic industrial infrastructure as well as the ancillary in the country was primitive, and narrow in scope. The activities of the first few years at CVRDE as well as at VRDE were thus limited to one of defect investigations, and improvements in the fighting vehicles held by the Services. Several projects were taken up in the 1960s and these were based on utilisation of available vehicle chassis, but changing the superstructure to suit the roles for which these were planned to be utilised. A few of these are described. Armoured patrol car, which was forward areas, was designed with an armoured shell around the chassis and automotive of a one-ton vehicle with four-wheel drive. The vehicle was fitted with a machine gun turret with 360 degree traverse. It was intended to be a replacement to an existing vehicle. Armoured recovery vehicle on Vijayanta which was also intended as replacement to the obsolescent Sherman and Centurion armoured recovery vehicles, was the first Vijayanta tank variant. The heavy recovery vehicle involved power take off/pump drive, hydraulic winch and crane, the architecture of which had to be evolved keeping in mind the weight limit and ease of operation. The 130 mm self-propelled gun was the first of the artillery equipment of its kind developed in the country. It was a tracked vehicle non-turreted system with gun platform, crew stations, hydraulic suspension

Self-propelled 130 mm Gun on Vijayanta Chassis

lock for stability during firing and supporting equipment. The Vijayanta chassis was used with additional support on either side of the gun to withstand the high firing stresses and also to cater for longer recoil length. The project on the development of Bulldozer kit for Vijayanta was one more effort to extend the scope of the chassis for use in the field. It was the first tank-mountable system and the configuration evolved required minimum changes to be made to Vijayanta so that adaptation and manufacture can be carried out with minimum difficulties.

By the mid of the 1970s, the projects for the development of armoured patrol car, the armoured recovery vehicle and the Bulldozer kit on Vijayanta were successful and orders were placed on the manufacturing agency to produce about 100 units of each for introduction into the Services. The project on the development of a self-propelled 130 mm gun on the Vijayanta chassis was completed in the second half of 1970, evaluated and found useful by the Army who placed orders for about 50 units. The existing facilities in mechanical engineering were upgraded so that it would be possible to undertake building of prototypes. Studies were also carried out for improving the operational effectiveness of Vijayanta tank with respect to fire power, kill probability, mobility and night fighting capabilities and corresponding modifications were proposed for implementation. These would be taken up in the 1980s.

In the field of wheeled vehicles, development of new series of vehicles for the Army with high mobility in cross country and desert/ sandy terrains to meet the futuristic requirements were taken up. A number of prototypes were fabricated and were subjected to evaluation by the Services.

Combat Vehicles Research & Development Establishment

With the insight gained on Vijayanta during the period of technology transfer and defect investigation, with the engineering knowledge acquired during the successful execution of the projects launched in the 1960s, CVRDE was ready for the next challenge of tank development. Even as Vijayanta was in series production, a strategy to build the concept of next generation tank was discussed and debated between the Services and DRDO so that a Qualitative Requirement (QR) was generated in August 1972. Worldwide, the technological advancements taking place in the field of guns and ammunition, armour, and sights/sensors resulted in pursuing multiple options so that a change could be effected with minimum delay and difficulty, once a specific trend is sensed. In order to narrow the options so that the process of design and development can be set in motion, a Steering Committee was constituted by the Government of India with Secretary, Defence Production as the Chairman with a high level representation from the Services, DRDO, DGOF, and public sector industries for dialogue, review and direction. The project for the development of the next generation tank was assigned to DRDO in May 1974 and by November 1974, the system design was initiated. The decisions about weight and dimensions of the tank, the engine and its transmission, the suspension, the armour, the sights and vision and the main armament were arrived at in a series of sittings and CVRDE was designated as the nodal agency with collaboration from ARDE/HEMRL on guns and ammunition, DMRL on armour, and IRDE on sights and sensors. The only grey areas, i.e., areas where the competence did not exist or where competence would have to be built or acquired, were that of the engine, smooth bore gun and the missile with its launching mechanism. The missile option was dropped. The main armament was decided to be 115 mm gun with rifled bore, the engine would be liquid-cooled diesel engine to be imported for the first few prototypes from one of the three countries namely, UK, France or West Germany.

The engine being the power pack and hence the core, it was decided to have a fall-back option, i.e., indigenous engine development with air cooling at CVRDE as the automobile industry in the country had not developed IC engines for the vehicles that were in production. The armour would be 5 per cent nickel armour. IRDE was required to develop weapon stabilised fire control system with the periscopic main sight integrated with laser range finder, a separate night vision device based on image intensification devices and a third sight on the cupola for the commander. Since laser technology was just getting introduced in tanks, to aid IRDE in their development, import of two suitable systems from abroad was accepted. The time frame indicated by DRDO was brought down by two years.

To be continued...

VISITORS TO DRDO LABS/ESTTS

DEAL, DEHRADUN

Dr G Satheesh Reddy, Secretary DDR&D and Chairman DRDO visited Defence Electronics Application Laboratory (DEAL) on 29 August 2020. He was accompanied by Shri GN Rao, DG (PC&SI), Dr (Smt) Chandrika Kaushik, Director, DISB, and Shri Prateek Kishore, Director, P&C. Ms J Manjula, DG (ECS), joined through VTC link. Dr Reddy was briefed about the ongoing and planned projects at DEAL by Shri PK Sharma, Director, DEAL. Chairman DRDO reviewed the future roadmap of DEAL at length. He planted a tree at the DEAL campus. An Industry Meet with industrialists of Uttarakhand was organised during the visit. DEAL displayed products developed by it including CIFF, SDR, Rustom Data Link, GSAT-6 Terminals (MST, HHT & SMT) and multi-channel hub base band modem. Chairman praised the efforts put by DEAL in the development of state-of-the-art technologies and products in communication and surveillance.

Dr G Satheesh Reddy, Secretary DDR&D and Chairman DRDO at DEAL

CAIR, BENGALURU

❄ Air Vice Marshal KVR Raju, VM, Director, IAF PMT, visited Centre for Artificial Intelligence & Robotics (CAIR) on 20 August 2020. There was a briefing by Dr UK Singh, OS & Director, CAIR followed by discussion and demonstration of technologies developed by CAIR in the area on Intelligent Systems and Robotics, Command and Control, GIS and Secure System.

❄ Air Vice Marshal SP Dharkar, AVSM, DG Defence Space Agency, visited CAIR on 22 June 2020. There was a briefing by Dr UK Singh, OS & Director, CAIR, followed by discussion and demonstration of technologies developed by CAIR in the area of Intelligent Systems and Robotics, Command Control and Secure System.

Air Vice Marshal KVR Raju, VM, being briefed about CAIR activities

AVM SP Dharkar, AVSM being briefed about CAIR technologies

Government of India
Ministry of Defence
Defence Research & Development Organisation

Let us Build a Self-Reliant India

Dare to Dream 2.0

DRDO Innovation Contest

"Scheme to Promote Individuals & Start-Ups for Innovation in Defence and Aerospace"

AWARDS

UPTO
₹10 Lakh

ELIGIBILITY

INDIVIDUALS
Citizen of India above 18 years

START-UPS
Recognized by DPITT, Govt. of India

Last Date of Submission

15 October 2020

For Registration and more details please visit...

https://www.drdo.gov.in