DIRECTOR



Dr. V Narayanan, Distinguished Scientist (Apex Scale) is currently the Director of Liquid Propulsion Systems Centre (LPSC), one of the major Centres of the Indian Space Research Organisation (ISRO) having its Headquarters at Valiamala in Thiruvananthapuram and a Unit at Bangalore. As Director he is providing techno-managerial leadership of LPSC which is engaged in the development of Liquid, Semi Cryogenic and Cryogenic Propulsion Stages for Launch Vehicles. Chemical and Electric Propulsion Systems for Satellites, Control Systems for Launch Vehicles and Transducer development for propulsion system health monitoring.

Dr. V Narayanan, who is a Rocket & Space Craft Propulsion Expert has joined ISRO in 1984 and functioned in various capacities before becoming Director of the Centre. During the initial phase, for 4 & 1/2 years, worked in the Solid Propulsion area of Sounding Rockets and Augmented Satellite Launch Vehicle (ASLV) and Polar Satellite Launch Vehicle (PSLV) in Vikram Sarabhai Space Centre (VSSC). Contributed in the process planning, process control and realization of Ablative nozzle systems, Composite motor cases and Composite Igniter cases.

In 1989, completed M. Tech in Cryogenic Engineering with First Rank at IIT-Kharagpur and joined the Cryogenic Propulsion area in Liquid Propulsion Systems Centre (LPSC). ISRO's Geosynchronous launch vehicles namely GSLV Mk-II & GSLV Mk-III capable of placing 2-Tonne & 4-Tonne class Communication Satellites in Geo Transfer Orbit have Cryogenic Propulsion Stages as terminal stages.

As one of the few Cryogenic members worked in this area in the beginning, Carried out fundamental research, theoretical & experimental studies and contributed in the successful development and testing of Cryogenic sub systems namely Gas Generator, Sub-scale Cryogenic engine of 1 tonne thrust and Thrust Chamber of 12 tonne thrust.

Considering the long-lead time required for the development of Cryogenic stage of GSLV MkII vehicle, for meeting the initial flights, few cryogenic stage hardware were procured from Russia. Towards this, as an expert in Cryogenic propulsion, contributed in the development of mission management systems, contract management and the successful flights of GSLV MkII vehicle with procured cryogenic stages.

For sustained operation of GSLV MkII, initially ISRO planned for technology acquisition of Cryo Stage for manufacturing in India. But due to Geo political reasons, the technology acquisition could not succeed and ISRO decided to develop CUS indigenously. Dr. V Narayanan has played crucial role in the successful development of Cryogenic Upper Stage (CUS) and contributed in making it operational for the GSLV Mk II vehicle.

For the GSLV MkIII Experimental mission with CARE module, conceived and realized the Passive Cryogenic Stage and contributed for the successful experimental flight. As the Project, Director of C25 Cryogenic Project, provided techno-managerial leadership and conceived, designed and developed the 25 Cryogenic Propulsion System of GSLV Mk-III Launch Vehicle powered by an engine developing a thrust of 200kN. Contributed in establishing necessary infrastructure and facilities for design, analysis, realization, testing and launching. Due to innovative approach, the C25 Cryo Stage is developed under his guidance in a shortest time frame with all successful tests and inducted in GSLV MkIII vehicle. Subsequently he also made the stage operational.

His contribution, made India one among six countries in the world to have the complex and high performance cryogenic propulsion systems and made self reliance in this area.

Parallely completed PhD in Aero Space Engineering from IIT-Kharagpur in 2001. The work carried out as part of M.Tech thesis titled "Cavitating Venturies for Flow Control in Cryogenic Rocket Engines" and PhD thesis titled "Thrust and Mixture Ratio Regulation Systems for Cryogenic Rocket Engines" were directly employed in the development of Indian Cryogenic Propulsion Systems.

Towards GSLV Mk-III M1/Chandrayaan-2 Mission, L110 Liquid Core Stage, C25 Cryogenic Stage were delivered for the vehicle. Propulsion systems for Orbiter & Vikram lander which include the throttleable thrusters for soft landing were also developed and delivered for the Chandrayaan-2 Mission, under his guidance. As the Chairman of the National Expert Committee constituted to study the reasons for hardlanding of Chandrayaan-2 landership, contributed in pin pointing the reasons and corrective actions required to overcome the observations. Realised and delivered all the Propulsion Systems for Chandrayaan-3.
For the Indian Human Space Flight (Gaganyan) programme, working on the Human Rating of C25 and L110 liquid stages of LVM3 vehicle and the development of Propulsion modules for Crew module & Service module and the Cabin pressure control systems. Thermal & humidity control systems and the propulsion stage for Test Vehicle.

For enhancing the GTO payload capability of LVM3 vehicle and meeting the future Indian Heavy Lift Rockets, guided the team and designed a Lox-Kerosene semi Cryogenic Propulsion System and providing techno-managerial leadership for its development. Taken up the development of improving the C25 Cryogenic stage performance with higher propellant (32 tonnes of LoX & LH2) loading with higher thrust (22 tonne) engine. His team is also developing 100T thrust LOX-CH4 Engine & Electric Propulsion thrusters. He has also made significant contribution in the Spacecraft Propulsion area.

Contributed as the Member of two Failure Analysis Committees (FACs) of GSLV MkII D3 and GSLV MkII F02 vehicles and , Member Secretary of the First Indian Cryogenic Upper Stage Engine FAC. Dr. Narayanan was a member of the ISRO's 12th Five Year plan-Drafting Group and contributed in finalizing the propulsion system development during 12th FYP. He has also finalized the Propulsion Road Map of ISRO for the next 20 years (2017 - 2037). As Director of LPSC, during the last 5 years, he has delivered 164 liquid propulsion systems for 41 launch vehicle and 31 space craft missions. Contributed in pursuing R&D activities and infrastructure development in Liquid Propulsion area.

Dr. V Narayanan, is currently the Chairman of LPSC-IPRC Co-ordination Committee and Chairman of Programme Management Council - Space Transportation Systems.
Dr. Narayanan is an Alumni of Indian Institute of Technology Kharagpur and has taken his M.Tech. with First Rank in Cryogenic Engineering in the year 1989 and Ph.D in Aerospace Engineering in the year 2001. He is a recipient of Silver Medal from IIT Kharagpur for First Rank in M.Tech, Gold Medal from Astronautical Society of India (ASI), ASI Award for Rocket and Related Technologies, Team Award from High Energy Materials Society of India, Outstanding achievement & Performance Excellence Awards and Team Excellence Awards of ISRO. He is also awarded Honorary Degree of Doctor of Science (Honoris Causa) from Sathyabama University, Chennai. He has been awarded with the Distinguished Alumnus Award-2018 by IIT, Kharagpur, National Design Award-2019 from National Design & Research Forum of Institution of Engineers (India) and National Aeronautical Prize-2019 from Aeronautical Society of India (AeSI).
Dr. Narayanan is a Member of International Academy of Astronautics (IAA), Fellow of Indian National Academy of Engineering, Member of Space Propulsion Committee of International Astronautical Federation, National President of Indian Society of Systems for Science and Engineering (ISSE), Fellow of Institution of Engineers (India), Fellow of Indian Cryogenic Council, Fellow of Aeronautical Society of India, Served as member of INAE Governing Council and Member in various National and International Professional Bodies. He is also serving as a Member of Governing Council, and Board of Indian Institute of Space Science and Technology (IIST) and Academic Council Member of some of the Engineering Colleges.
Dr. Narayanan has published large number of technical papers (Internal Reports: 1200, Journal/conference papers : 50 and Book chapters : 3). Delivered large number of keynote speeches and ten convocation addresses in Engineering institutions including IIT's and NIT's.

Source : HRD /PPEG ***Updated on 11.07.2023***