

## NAL IS 37

The Tenth NAL Foundation Day function, held at the Systems Auditorium on 11 June 1996, was special for at least two reasons: it was Dr T S Prahlad's first function as NAL Director and it introduced, for the first time, the NAL Technology Lecture into the day's programme. Otherwise it was a typical Foundation Day function with an overflowing audience, two excellent lectures, release of the NAL Annual Report for 1995-96 and the distribution of Outstanding Performance Awards.

After a brief welcome address by Dr Prahalad, in which he introduced the function's principal speaker, Lt Gen (Dr) V J Sundaram, Director, DRDL and RCI, and explained the rationale for introducing the NAL Technology Lecture ("an opportunity to share and take pride in our technological successes"), it was time to dim the lights and settle down to listen to the extraordinary narrative of the PRITHIVI mission by Lt Gen Sundaram.

Lt Gen Sundaram's lecture *Concept-to-Induction of High-Tech Projects* was a masterly commentary on how to manage the development of high-tech defence equipment (with the PRITHIVI missile as the recurring example) and (later) support its successful induction into the armed services. "Work on high-tech projects starts well before the official project sanction". Gen Sundaram said explaining how the PRITHIVI concept evolved as early as in 1977 with the build up of competence and facilities and the decisions on user participation, and: thereafter the work involved continuous multi-disciplinary collaboration.

Gen Sundaram then went on to talk of project philosophies ("the case of PRITHIVI, our philosophy was quality"), how even the development of a seemingly simple components (such as a propellant tank) involves unexpected complexity, how the 'different projects actors' must be harmoniously managed, and how "every time you think there's no problem... that's the problem!".

The DRDL Director was at his best when he described the drama and suspense which preceded the first successful PRITHIVI flight in 1988 and talked of the tasks involved in the successful induction of the missile into Army ("the Army is not impressed with a few successful trial flights; it wants high quality field performance!"). It was also a special pleasure to hear the retired General ruminate on the wide applicability of the Army's ten principles of war. "The Army's principles war can be applied just as successfully in public affairs or in the management of Microsoft Corporation!".

The lecture ended with a six minute video film on the PRITHIVI trail flights which contained abundant documentary proof of the accurate performance of the surface-to-surface missile. Lt Gen Sundaram rounded off his narrative by warning that there can be no room for complacency: "no development or induction is ever complete. We must go on and on in our relentless pursuit of success and accuracy".

The First NAL Technology Lecture was delivered by Dr Indiran Rajagopal, Head Surface Engineering Unit on *Surface Modification Technologies*. Using three NAL case studies (and some of the best colour viewgraphs seen recently in the Systems Auditorium), Dr Indira Rajagopal explained how surface modification technologies can result in extremely cost-effective performance enhancement. She talked of highly polished mirrors developed by NAL for the INSAT programme, the sprayable radar reflecting paint with very good AI reflectivity developed by NAL and of NALSUN – NAL'S black chromium solar selective coating and its phenomenal commercial success. It was an accomplished scientist, and one which gladdened the NAL heart.

The function ended with the presidential remarks by Prof H S Mukunda, Chairman, Department of Aerospace Engineering, Indian Institute of Science in which he called for "greater synergy among the aeronautical sciences" and the vote of thanks by Dr B R Somashekar in which he expressed the view that an integrated civil and military aircraft development programme was perhaps India's last chance to come good in the world of aeronautics.