

## Satish Dhawan

The Special Section in *Current Science*, 2020, **119**(9), 1417–1488, celebrating the birth centenary of Satish Dhawan (SD), the first Chairman of the Space Commission and Secretary, Department of Space (DoS), Government of India, besides several other leadership roles that he had played in institutions like the Indian Institute of Science (IISc), Bangalore, that he headed, served, guided or set-up, is a collector's item.

Here, I would like to add an under-recognized dimension to the seminal and defining role that SD played in so many aspects of satellite-based services for broadcasting, telecommunications and weather watch.

It is to SD that we owe the fully fleshed-out concept of the first-generation multi-functional Indian National Satellite System (INSAT-I). The INSAT Group (of Secretaries/equivalents) formed by the then Prime Minister (PM) Indira Gandhi at SD's initiative around 1976, had Vasant Rajadhyaksha of Planning Commission (ex-Chairman, Hindustan Unilever Ltd) as its Chairman; and SD, M. G. K. Menon (then Secretary, Electronics), Nirmal Mukherjee (then Secretary, Civil Aviation) as its members alongside Secretaries of Communications, Information & Broadcasting (I&B) and Finance. SD headed the Sub-Group on INSAT-I System Definition with S. M. Agarwal (Secretary, Communications), S. M. Burney (Secretary, I&B), Goku Menon (Secretary, Electronics) and Nirmal Mukherjee (Secretary, Civil Aviation) as its members and supported by a large group of senior experts from India Meteorological Department (IMD), Communications (Posts & Telegraphs, Overseas Communication Service and Wireless Planning and Coordination Wing), I&B (DD and AIR), Planning Commission and DoS/Indian Space Research Organisation (ISRO) as its members. I had the privilege of serving as a non-member Secretary of this sub-group.

In 1977, when the Ariane Passenger Payload Experiment (APPLE) investment decision went before the new Government of Morarji Desai, and was approved after a discussion that took about 45 minutes, Mukherjee (by then Cabinet Secretary) and SD briefly re-

minded the Cabinet of the pending INSAT-I proposal. Instead of asking the then post-election inactive main group, the Cabinet, while approving APPLE investment, asked DoS to bring up the INSAT-I proposal within a month. This was obviously facilitated by the 'last ICS' Cabinet Secretary Nirmal Mukherjee, who as Secretary Civil Aviation – under which Ministry IMD was then – had got to understand the transformative role and function of INSAT while participating actively in the SD-led INSAT-I System Definition Sub-Group of Secretaries.

Once he made up his mind, SD had the unique ability to softly but persuasively put his views and proposals across, carry his institutional peers with him. As he moved forward with an idea, if SD found merits in the ideas and viewpoints of those critiquing it, he acknowledged and incorporated them.

Apart from providing intellectual, scientific and engineering leadership, SD also had excellent administrative abilities, and plied to collective advantage the skills of stalwarts like M. A. Vellodi (IFS), T. N. Seshan (IAS) and Y.S. Das (IAAS). In the SatCom field, these abilities manifested first with 1 kW Kheda TV transmitter under ISRO control for the duration of SITE, and the strategic placement of an experimental Earth Station in Malcha Mahal, within Delhi. Both actions required approval at the highest level, viz. from the then PM Indira Gandhi. SD's planning ahead for INSAT also manifested in STEP, jointly with P&T; STEP was a parallel for SITE but in telecommunications services.

SD demonstrated his acumen again by convincing the new Government of Morarji Desai, to approve, within its first few months, investment in India's first experimental geo-stationary satellite, APPLE. He forged a good working relationship with the Finance Minister, H. M. Patel and Cabinet Secretary Mukherjee. SD persuaded the European Space Agency, then led by Roy Gibson, to accept the proposal for an experimental communications satellite to be carried as a passenger on the third developmental flight of Ariane as APPLE.

Bringing multiple agencies together and structuring the INSAT Coordination

Committee (ICC) were SD's initiatives and management innovations. SD's presentation style 'Red Book', in A4-size landscape-orientation, on his group's report and recommendations to the main group on INSAT-I is a classic document; ahead of its times in a style, that would later be generically known as a 'power point' presentation.

Another important step for the implementation and oversight of the multi-agency INSAT project was the creation of the unique INSAT Coordination Committee of Secretaries chaired by Secretary DOS (then SD) through an Order from the Cabinet Secretariat. It was the result of then Cabinet Secretary NM – SD collaboration. INSAT-I Space Segment was with DOS, Telecom ground-segment and utilization with MOC/P&T, TV and radio ground-segments and utilization with MI&B/DD and AIR and Met ground-segment and utilization with IMD/MCA. Overall coordination and oversight came from ICC, assisted by a Technical Advisory Committee (TAG) which was convened by the Programme Director of INSAT in DoS. SD was particular that ICC members attend meetings in person; there were occasions when even the Cabinet Secretary and Principal Secretary to the PM also participated as Invitees.

It is such bureaucratic master strokes that sometimes make history. Agile thinking and nimble footwork was such that even the then Telecom Minister, George Fernandes, supported it, and Raj Narain (the Health Minister), who was not in favour of 'hi-tech', went along.

Cabinet Secretary C. R. Krishnaswamy Rao Sahib and SD developed great respect and admiration for each other, and their symphony played out in many other areas of national importance, in addition to shaping the early governance of overall inter-agency INSAT System.

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