

The RTA-70

India's Regional Airliner Programme

The National Aerospace Laboratory's (NAL) ambitious RTA-70, a national regional transport aircraft programme that has been essentially on paper for almost a decade now, has been officially cleared, with the CSIR approving an initial Rs. 300 crores (US \$75 million) for proof of concept studies.

The RTA-70 is being developed to meet specific needs of the country for short-haul flights, as also for the international market. According to industry estimates, over the next 20 years there will be a requirement for more than 3000 regional airliners in the 50-90-seat category, to replace current fleets with ATR 42/72s, Bombardier Dash 8s, Fokker F27/50s, HS 748s, Saab 340/2000s, Antonov An-24s and others. The RTA-70 design approach is ambitious as it must aim for some 25-35% lower flyaway and direct operating costs than contemporary aircraft.

A first meeting was held on 29 February 2008 with the Directors and senior scientists of various laboratories/institutes of the CSIR, DRDO and DAE. The meeting was intended to appraise the various R&D organisations of the technology needs of the Regional Transport Aircraft (RTA-70). Former head of the LCA project, Dr Kota Harinarayana had joined NAL as a *Raja Ramanna Fellow* and was to spearhead the Regional Transport Aircraft project. Dr Kota Harinarayana presented an overview of the regional transport aircraft programme detailing the need for a new generation aircraft based on market demand for an aircraft with low fuel burn, ownership and maintenance costs. Technologies required in the form of a laminar flow wing, hydrophobic coatings, use of low cost composites, fly-by-wire controls, advanced avionics that would enable use of ill-equipped airfields, integrated vehicle health monitoring etc. Presentations from NAL scientists and consultants from the RTA group then followed on RTA aerodynamics, super hydrophobic coatings, morphing and the use of SMA for high lift devices and maintenance for civil aircraft. On



the airframe, presentations on structural technologies required, use of piezo and SMA related smart materials for flutter and gust control, structural topology, structural health monitoring (SHM) and low cost composites were made. Architectures for avionics, active noise control systems flight control systems (fly by wire) and synthetic vision were described. Utility systems including ECS, all electric systems etc, were also presented.

In August 2008 the former President of India Dr APJ Abdul Kalam said that "India can produce small passenger jets by 2020." But for this, India needs to make optimum use of its technology in the aerospace sector. Kalam, popularly called the father of India's missile programme, was addressing a gathering of students at Amity University in Noida. "India has to work for 70-seater aircraft. It should be so designed that with only change in fuselage length it could vary the passenger capacity to 50 or 90.... with the technology available, production of 70-seater passenger aircraft before 2020 is possible. This will lead to a business volume of \$15 billion," Dr Kalam forecast.

It was then announced in December 2009 that the Indian Space Research Organisation (ISRO) will be part of a consortium, led by NAL and would be run by an independent commercial body, with public and private partners, including an overseas aerospace firm (yet to be identified). According to Dr. CG Krishnadas Nair, President of the Society

of Indian Aerospace Technologies and Industries (SIATI), "once approved, the project will take around six years to build and the aircraft certified".

In May 2008, it was decided that technologies required in the programme included a laminar flow wing, hydrophobic coatings, use of low cost composites, fly-by-wire controls, advanced avionics that will enable operation from marginal airships and integrated vehicle health monitoring. Pratt & Whitney Canada, power plants have been mooted for the RTA-70.

For the airframe, structural technologies identified as crucial include use of piezo and SMA related smart materials for flutter and gust control, structural topology, structural health monitoring (SHM) and low cost materials. Architectures for avionics, active noise control systems flight control systems (fly by wire) and synthetic vision were additionally identified. Structural health monitoring, in fact, is being developed as a core technology of the RTA-70.

"HAL will be the manufacturing partner and firms such as Infosys Technologies and the local unit of US technology firm Honeywell International, will be building some technology components," stated Dr. Satish Chandra, Head of the RTA programme at NAL. The RTA-70 will be "capable of reliable and safe operation from airports with minimal infrastructure and instrumentation facility under all-weather conditions."

The RTA prototype is expected to fly in 2013.