Dr Amitabh Saraf,
Outstanding Scientist,
Group Director (Flight Control Laws LCA Navy)

Amitabh Saraf completed his B Tech (Mech Engg) from IIT Bombay in 1990, M Tech (Systems and Control Engg) from IIT Bombay in 1992 and PhD (Aerospace Engg) in 2000 from IISc Bangalore. He completed his post doctoral research from Univ of California, Irvine in 2003.

Amitabh Saraf is a member of National Control Law team which is responsible for development of flight control laws for the Airforce and the Naval variants of Indian Light Combat Aircraft. He has 25+ years of experience in the design of flight controls, guidance and navigation systems, sensor data processing and redundancy management algorithms, and system identification for aircraft and reentry vehicles. He has vast experience in nonlinear systems modeling and simulation. He has played a key role in design of flight control laws for Indian Light Combat Aircraft (LCA-Tejas). He has also designed several special control law modes for LCA Navy including automatic modes for ski jump, landing mode and bolter mode.

He has received several awards for his excellent contributions to field of flight controls including best PhD thesis award at IISc, Swarnajayanti award from Aeronautical Society of India and Agni Award from DRDO twice, etc. He has represented India to deliver a talk on 'Ski jumping the LCA Navy' at the prestigious Society of Experimental Test Pilots in 2016 at USA. He has published a number of papers in international journals and conferences.

Mr. Rajkanwar Jolly
Scientist 'G', Group Director

Rajkanwar Jolly has passed B.Sc.Engineering (Aeronautical) from Punjab Engineering College, Chandigarh in 1982 and M.Tech. (Aeronautical) from IIT-Madras in 1984. He has worked on the Indian Light Combat Aircraft programme at HAL and ADA for about 28 years in areas related to configuration design, aerodynamics, performance, wind tunnel and flight testing, air intakes and engine-airframe integration. He was associated with conversion of the land based version of LCA to a carrier compatible version and is now part of the team evolving a new fighter aircraft design optimized for carrier operations. He has also associated with design of a regional transport aircraft at NAL as well as worked in the flight operations engineering department of an airline.

“Design of Control Laws for Carrier Operations: LCA Navy Experience”

The naval variant of Indian Light Combat Aircraft, LCA (Navy) has been envisaged to develop and demonstrate a number of short take-off but arrested recovery (STOBAR) technologies that enable an aircraft to be operated from aircraft carrier ships. The legacy aircraft for the design is the trainer variant of LCA Airorce. A number of modifications and redesigns have been carried out on the aircraft to enable ship operations, which include integration of a stronger landing gear, arrestor hook system and a new aerodynamic control surface called the Leading Edge Vortex CONtroller (LEVCON). The structural elements have been strengthened in redesign to meet the significantly higher loads and shock levels encountered during arrested landings and ski jumps. Specialised Test setup along with augmentation of the existing test facilities are also done to validate the aircraft design for carrier operations. Two prototypes of LCA(Navy) are presently being flight tested to demonstrate the carrier suitability of the aircraft from Shore Based Test Facility (SBTF) at Goa, India.

Take off and landing from the ship deck poses unique challenges for design of the flight control system. The control laws of LCA(Navy) has three very special modes for three carrier specific take off and landing. These include (i) ski jump take off mode, (ii) Approach AOA Hold Controller for carrier approach and landing and (iii) bolter mode for quick take off in case of missed arrestment at landing. This webinar gives a brief introduction to the design of LCA(Navy) and focuses on the new control law modes that have been designed for carrier operations. We also share experiences during flight testing of LCA(Navy) aircraft and some lessons learnt.