‘Tiger Bird’

HAL’s Light Combat Helicopter (LCH)

The Vice Chief of Air Force, Air Marshal PK Barbora was rightfully exultant when he stated that “the Tiger Bird had good export potential” even as it was being developed as a weapon system “dedicated to the nation”. This was at the HAL Airport in Bangalore on 23 May 2010, two months after the LCH’s maiden flight on 29 March (see *Vayu II/2010* and *III/2010)*. *Tiger Bird* is an appropriate name and perhaps inspired from the design painted on the prototype.

The LCH is being developed as a dedicated attack helicopter derived from the Advanced Light Helicopter and fitted with weapons and special mission systems and having a crashworthy wheel landing gear. Maiden flight of the LCH marked successful culmination of three years of design and development efforts by Rotary Wing Research and Design Centre (RWRDC) of the Helicopter Complex. A full fledged qualification test programme will follow leading to initial operation clearance (IOC) by December 2011 and induction into India’s armed forces.

The LCH inherits many technical features of the Dhruv including its rotor system transmission, power plant, hydraulics, IADS, and avionics. The features that are unique to LCH are its sleek and narrow fuselage, tri-cycle crashworthy landing gear, tandem cockpit, self sealing fuel tanks, aerofoil shaped stub wings for weapons, armour protection,

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NBC protection and low visibility features which make the LCH "lethal, agile and survivable."

The LCH development was based on the concept of design, ground testing and concurrent fabrication, which resulted in manufacture of the first machine within 40 months. The design and manufacturing was carried-out using the state-of-art CAD/CAM facilities which obviated the requirement of an interface check rig. The ground testing included wind-tunnel testing, landing gear drop tests and shake test. A mock up was also built for evaluation by the Indian Air Force.

The development team included members of HAL, Indian Air Force, the certification authorities CEMILAC, DGAQA and various suppliers of the onboard systems. Fitted with a 20 mm turret gun, LCH armament includes rockets and air-to-air/air-to-ground missiles on the weapon stations. The helicopter would have day/night targeting systems for the crew including the helmet-pointed sight and electro-optical pod consisting of CCD camera/FLIR/Laser range finder/laser designator. The LRF and LD facilitate measurement of range to the target and guidance to the laser guided missiles respectively. The Digital Video Recorder would enable recording of the vital mission for debriefing purposes. The turret gun skewing is controlled by the helmet mounted sight of the gunner.

The LCH is also fitted with a Self Protection Suite consisting of Radar/Laser Missile warning systems and Countermeasures dispensing system. It is planned to integrate IR/ Laser missile jammer on the helicopter. Another addition is a Data Link for Network-centric operations facilitating transfer of the mission data to the other airborne platforms and ground stations operating in the Network, thus facilitating force multiplication.

The LCH is designed for low detection (visual, aural, radar and infra-red) and includes armour protection of critical areas. A 30 minute dry running capability of the gear box is a built in-feature to survive after any ballistic hit to the transmission system. Crashworthiness features are built into the wheel landing gear and main structure while dual redundant systems also enhance effectiveness of helicopters in the battlefield environment.

The performance features of the LCH i.e. rate of climb, cruise speed, service ceiling are comparable with those of contemporary helicopter types such as the A129 and Tiger.

Development costs of the LCH have been "relatively low" compared to that of other helicopter types in its class, ensuring lower unit costs. "LCH design is optimised to ensure ease of maintenance with improved reliability of all the onboard systems to keep the life cycle operating costs low as well," states a HAL designer.

Wing Commander (Retd.) Unni Pillai (centre) Chief Test Pilot (RW) with his team after maiden flight of the Light Combat Helicopter (LCH).