

The HAL Rotary Wing 'Lightweights'



An excellent example of Made in India initiative, HAL Dhruv (Pole Star) Advanced Light Helicopter (ALH) has been developed indigenously by the Helicopter Division of the government-owned Hindustan Aeronautics Limited (HAL). It is a light (5.5 tonne) multirole and multi-mission helicopter for army, air force, navy, coast guard and civil operations, for both utility and all weather attack roles. The helicopter, which is built to FAR 29 specifications, entered series production in 2000. Its prime variants are classified as Dhruv Mk I, Mk II, Mk III and Weapon System Integrated (WSI) Mk IV known as Rudra. HAL has produced more than 300 Dhruv helicopters till October 2020, for Indian Armed Forces and exports. Also the fleet of the Indian Air Force (IAF) Display Team, Sarang (Peacock) includes the Dhruv helicopters.

The helicopter has a twin-engine configuration allowing continued flight virtually throughout the flight envelope. The prototype helicopter is fitted with two Turbomeca TM 333-2C or 2B2 engines rated at 740 kW take-off power.

A more powerful engine for the Dhruv, the Shakti (Ardiden 1H) rated at 900 kW was developed under a cooperative agreement between HAL and Turbomeca and manufactured at Bangalore. Avio was selected to supply Integrated Dynamic Systems (IDS) for the Shakti engine. The first flight of the Dhruv Advanced Light Helicopter with the new engine took place in August 2007 and it was certified in 2008. The maximum fuel capacity is 1,400 litres and the fuel system includes cross feeding and fuel dumping.

The Dhruv ALH helicopter is of conventional design and about two-thirds

by weight of composite construction. The high tail boom allows easy access to the rear clamshell loading doors. The four-bladed hinge less main rotor can be manually folded. The blades are mounted between cruciform-shaped carbon-fibre-reinforced plastic plates on a fibre elastomer constructed rotor head. The tail section features bearing less tail rotor. The helicopter is equipped with an active vibration control system developed by Lord Corporation of North Carolina that uses sensors to monitor on-board conditions and outputs signals to actuators to cancel fuselage floor vibrations.

The cockpit section of the fuselage is of Kevlar and carbon-fibre construction and is fitted with crashworthy seats. The navigation suite includes a Global Positioning System (GPS), a Doppler navigation system, distance measuring equipment, a true air speed indicator, automatic direction finder,



Lineup of Rudra's