

Indigenous integrated life support system for fighter aircraft pilots

T.S. Subramanian

CHENNAI: An integrated life support system (ILSS), which will administer required quantities of oxygen at varying altitudes to pilots of fighter aircraft on long missions and protect them from losing consciousness due to severe gravity (G) forces, has been developed by the Defence Bioengineering and Electromedical Laboratory (DEBEL) in Bangalore.

Light Combat Aircraft (LCA) Tejas will be equipped with the ILSS from February 2011. It will provide 100 per cent oxygen to pilots in case of ejection from the fighter aircraft.

An important constituent of the ILSS is the onboard oxygen generation system (OBOGS), which keeps the pilot's oxygen status at sea-level despite flying at high altitudes. The OBOGS enables the aircraft to undertake long-endurance missions, free from the burden of re-charging the oxygen

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cylinders. A team of DEBEL scientists, led by its director V.C. Padaki, developed the ILSS. The DEBEL, a laboratory under the Defence Research and Development Organisation, was assisted by K. Tamilmani, Chief Executive, Centre for Military Airworthiness & Certification (CEMILAC) in Bangalore.

Recently, DRDO Chief Controller (Life Sciences) W. Selvamurthy handed over the ILSS prototype to P.S. Subramanyam, Director, Aeronautical Development Agency in Bangalore for fitment into Tejas and for trials.

Dr. Selvamurthy explained that the atmosphere contains 79 per cent nitrogen and 20 per cent oxygen. The OBOGS in the ILSS will process the atmospheric air, remove the

nitrogen and administer the oxygen to fighter aircraft pilots on long missions.

The ILSS has another system called the Demand Oxygen Regulator (DOR) which will ensure that the breathing gas is delivered to the pilot as per the altitude requirements and also during anti-G straining manoeuvres that the pilot will undertake during combat missions. "It is an economical way of administering oxygen on demand," said Dr. Selvamurthy.

A valve enabled adequate G-suit inflation pressure to prevent loss of consciousness among pilots during the aircraft's steep ascent.

Dr. Padaki said the contraption has a novel electronic control unit which ensures proper OBOGS functioning

with changing altitude, monitors the ILSS and activates the back-up system in case of failure. The ILSS design caters to both single and dual-pilot operations.

The DEBEL, along with L&T as development-cum-production partner, will manufacture the ILSS.

Others who contributed to the ILSS' development include the Hindustan Aeronautics Limited, the Directorate-General and Aeronautical Quality Assurance, the National Flight Test Centre, the Institute of Aerospace Medicine and the CEMILAC. The ILSS can be customised to suit MiG-29, Sukhoi-30 and Mirage-2000 for their long-duration flights, Dr. Padaki said. It can be used in military hospitals in forward areas and at rarefied heights, thus obviating the need to carry oxygen cylinders, Dr. Selvamurthy added. After the United States, Russia and France, India is the fourth country to possess this technology.



The various components of the integrated life support system being inspected by (from left) K. Tamilmani, chief executive, Centre for Military Airworthiness & Certification; V.C. Padaki, director, Defence Bioengineering and Electromedical Laboratory; W Selvamurthy, Chief Controller (Life Sciences), Defence Research and Development Organisation; and P.S. Subramanyam, director, Aeronautical Development Agency. - PHOTO: SPECIAL ARRANGEMENT