On board the NH90
Thales is proud to be on board the NH90, the most modern tactical and utility helicopter for land and naval operations on the market. The NH90 programme is a success, with firm orders for 529 helicopters from 14 countries and additional export sales expected. The NH90 is available in two main versions, Tactical Transport Helicopter (TTH), and Nato Frigate Helicopter (NFH). NH90 Industries (NHI) has delivered more than 135 NH90 helicopters to end users to date.

The NH90 TTH is an advanced transport helicopter with state-of-the-art avionics, communication equipment and mission systems supplied by Thales, including an impressive glass cockpit. For mission requirements, Thales is providing avionics with the latest glass-cockpit display technology, the TopOwl helmet mounted sight and display, the mission tactical computer and the helicopter’s electrical systems.

The NH90 NFH is an advanced transport and anti-submarine warfare (ASW) naval helicopter equipped with additional Thales systems such as the Flash dipping sonar and sonobuoy processing systems.

Cockpit

**MFD88 and DKU smart displays**
Thales supplies the MFD88 smart multifunction display in the NH90 cockpit. This full-colour high-resolution fully integrated display is capable of providing synthetic and raster image for primary flight, navigation and tactical displays and systems, as well as engine monitoring. The multifunction display is compatible with night vision goggles and integrates all the necessary functions for stand-alone operation in one panel-mounted LRU. These include the aircraft systems bus interface, data processor and graphics generator. Thales supplies the Display Keyboard Unit (DKU), which is the main equipment to interface the crew with the helicopter system for avionics and mission control.

The MFD and DKU displays are also used in the tactical consoles in the cabin of the NFH for naval missions.

**TopOwl Helmet Mounted Sight Display**
TopOwl is the most advanced piloting helmet system available for helicopters and currently equips the NH90 TTH. The helmet mounted sight and display is based on a unique concept that incorporates a night vision system with a 100% overlapping projection of a binocular image on the visor. TopOwl enhances operational effectiveness by means of high accuracy head tracking symbology used to display flight and weapon management data and in turn reduce crew workload and increase flight safety.

TopOwl features day and night symbology, FLIR images (including high resolution), integrated image intensifier tubes (I2T), and a visor display equivalent to the highest level of night vision performance. Its modular design allows easy and immediate in-flight transition between day/night and I2T/FLIR configurations. TopOwl meets increasingly rigorous demands for safe flight operations in degraded visual environments such as night, brownout and whiteout.

This system offers high-quality video image and graphic symbology that can be projected on to the periphery of the visor, leaving the central area free from visual obstruction. In addition, pilots particularly appreciate the low weight of the ergonomically designed helmet sight.

Easily integrated with a full weapon suite (guns, rockets, air-to-air missiles), the system delivers top-of-the-market accuracy. A head position sensor used during target designation and weapon-firing sequences enhances this precision.
**Communication, Navigation, Identification**

Thales responds to NH90 operators’ requirements with an extensive, up-to-date and efficient Communication - Navigation - Identification (CNI) suite. This suite is designed to provide superiority, efficiency and safety for all NH90 missions.

**Communication**

The Communication system on board the NH90 covers the entire tactical V/UHF spectrum (tactical VHF, ATC VHF, maritime VHF and military UHF). It offers all the necessary voice and data services, with redundancies, via the latest-generation protection modes (PR4G F@stnet, Have Quick and SATURN). All radios in this system are encrypted according to NATO (COMSEC) standards.

With this communication system, the NH90 is capable of operating three simultaneous V/UHF channels to fulfil all operational communication needs on the battlefield as well as during transit.

**Navigation**

The Thales Multi-Mode Receiver (MMR) on board the NH90 is used for in-flight navigation and for landing the helicopter, by combining functions including VOR, ILS and Marker. Thales also provides the NH90 radio-altimeter. This radio-altimeter, specifically designed for helicopters, provides high-precision altitude readings for low level transit or penetration missions.

**Identification**

Identification functions on board the NH90 are provided by the Thales BlueGate IFF (Identification Friend or Foe) system, which combines a transponder with an interrogator and is fully compliant with civil (Mode S) and NATO standards.

With the BlueGate IFF system, the NH90 is instantly identifiable on the battlefield by air defence systems and allied units and knows the position of friendly platforms at all times.

**TopSIS**

Thales designs and manufactures the TopSIS Secure Intercom System, an all-digital system designed for providing secure communications. TopSIS manages and integrates audio signals, internal and external data, as well as voice.

The system, which is compliant with TEMPEST requirements, relies on fibre optic data buses between the central management unit and peripheral equipment. It offers lower mass installation compared with conventional systems.

TopSIS provides the NH90’s aircrew with fully secure voice communications throughout the helicopter. It has also been approved by the Communications Electronics Security Group (CESG) for the processing and routing of classified voice information to other intercom users and for transfer off board via approved encryption devices.

**Electrical systems**

NHI has selected electrical power generation system technology from Thales to efficiently power the vast array of electrical loads on board the NH90. The Electrical Power Generation System (EPGS) is composed of three alternators (ALT) 40 kVA, 115 VAC / 400 Hz and three Generator Control Units (GCU). Two alternators provide power to the Main and Auxiliary AC network and one alternator is dedicated to the de-icing system. Each GCU controls and protects the alternators and the helicopter systems.

The Thales system is recognised as the best value on the market and offers NHI operators better reliability and extended Mean Time Between Overhaul.
Services and support

Simulation
With its partners Rheinmetall Defence Electronics GmbH and CAE, Thales has developed Full Flight Mission Simulators (FFMS) for NH90 customers.

The Thales simulation solution for tactical transport helicopters is used to train crews for critical missions and is the only NH90 training solution in operational service in the world.

The solution has proven its high reliability and durability, providing invaluable training support for NH90 crews in a full range of missions and scenarios.

Thales’s SETHI computer generated forces software simulates a very realistic tactical environment involving thousands of players, each with their own behaviours and deployment doctrines.

Eleven image generation channels feed a 220-degree view of the training area, as well as multifunctional displays and helmet mounted displays for sensor images. These images are synthesised by Thales VIEW visual image generation software, which draws on a visual databases produced by Thales using the latest modelling techniques, and makes it possible to simulate the dynamic effects associated with helicopter flight.

Thales develops geo-specific imagery databases to represent large areas of terrain and/or complex infrastructure and buildings.

Ground Mission Management System (GMMS)
Thales is supplying its Australian customer with the Ground Mission Management System (GMMS). This system provides mission management in real time to help reduce pilot workloads.

The GMMS prepares the NH90 for the mission at hand via Data Load Devices (DLDs). DLDs are used to upload pre-mission configuration data and to download data captured for post-mission analysis and debriefing.

The GMMS is a vital link between the NH90, ground control and external operational support systems. Real-time voice and datalinks provide automatic updates of the tactical situation and mission tasking.

The system includes a 2D map display and a 3D simulated environment. It operates with common military message formats to provide the automatic storage and display of data received via formatted messages. The GMMS core supports other air, maritime and ground platforms through the use of a mobile computing device. It has a scalable distributed architecture that allows for both stand-alone laptop and networked operation.

Naval missions

Flash Sonics and sonobuoys
Thales provides the highly successful FLASH (Folding Light Acoustic System for Helicopters) dipping sonar/sonics system comprising integrated dipping and sonobuoy processing elements.

FLASH Sonics is the primary Anti-Submarine Warfare (ASW) sensor system installed in three NFH90 variants and has been developed to counter the threat of quiet submarines operating in the open ocean, or in littoral waters where reverberation and traffic noise make detection particularly difficult.

The system incorporates the very latest acoustic processing techniques, including multistatics, and provides simultaneous dipping sonar and sonobuoy processing with a wide range of operator tools and the latest displays.

The unrivalled operational performance and reliability of FLASH Sonics has been fully proven in worldwide service with the UK Royal Navy and with the US Navy and now provides the NFH90 with the highest level of ASW detection capability.

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