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Thales in Singapore

Page 2

Thales at Singapore Airshow 2010

- **Civil Aviation** **Page 3**
- **Airport Solutions** **Page 5**
- **Force & Homeland Protection** **Page 7**

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Thales in Singapore

Thales is a global technology leader for the Aerospace and Space, Defence, Security and Transportation markets. In 2008, the company generated revenues of 12.7 billion euros with 68,000 employees in 50 countries.

Thales's operations in Singapore date back as early as 1973, when the Group opened its first representative office. This presence has been developed and reinforced, and now the Group has over 400 employees in Singapore and is involved in Defence, Aerospace, Transport and Security.

In mid-2002, in order to better grow and manage its Asia-Pacific operations and businesses, which account for revenues of 1.5 billion euros per year, Thales decided to establish its regional headquarters in Singapore.

Moving along with expanding its industrial capabilities, two major companies are now operating from Singapore with a regional footprint:

- **Thales Aerospace Asia** providing support to all Thales's airline customers from India to Japan and from Korea to New Zealand;
- **Thales Security Asia** dedicated to developing Security Systems to Thales's private and government customers in South East Asia.

As a result of its long-standing ties with Singapore, Thales set up the **Thales Technology Centre Singapore (TTCS)**. This centre was developed with the principal aim of serving the Group's R&D activities, and with the ambition to grow it into a centre of excellence for selected R&D areas (sensors and components, software technology, signal and data processing, systems and networks). Officially launched in mid-2003, Thales Technology Centre Singapore, now 22 researchers strong, is clearly acknowledged as part of the local technology ecosystem and recognised as a promising vehicle for addressing some of Singapore's most demanding medium to long-term technology requirements.

A recent example of such developments within TTCS is the decision by Thales to invest in a Centre of Excellence for Naval Unmanned Vehicles.

In early 2005, a new initiative was launched with the establishment of **Thales@NTU**, a laboratory jointly managed by Thales and Nanyang Technological University (NTU). Thales@NTU strives to develop innovative dual-use civil / military technologies for the most demanding applications.

A new development occurred in 2007 with the opening of Espace Innovation, which provides a Collaborative Platform to develop Innovation Engineering in a Synthetic Environment customised to Singapore.

In October 2009, the CNRS, Singapore's Nanyang Technological University and Thales established a joint international research unit, called **CINTRA**. The new unit will research nanotechnologies for electronics, photonics and related applications.

Thales is proud to have contributed, over the past 35 years, to the development of Singapore and be associated with some of the country's most acknowledged achievements, such as:

- World-Class Air Travel (Changi Airport Air Traffic Management);
- Revolutionary Ground Transport Systems (North East Line Supervisory System);
- Superior Technologies delivered to the Singapore Air Force, Navy, Coast Guards and Police;
- Modernisation of Mine Counter Measure Vessels for the Republic of Singapore Navy.

Civil aviation

Overview

Thales is one of the few global companies addressing the full operational chain in the civil aerospace market including avionics and mission systems. It provides systems and functions for all types of aircraft - commercial airliners, regional aircraft, and helicopters - and is a first-tier partner of the world's leading manufacturers, including Airbus, Boeing, Bombardier, Embraer, ATR and Sukhoi, on all of their major programmes.

Thales constantly redefines "intelligence onboard" by means of solutions that make aircraft more connected, flights better managed, power better optimised, pollution reduced, as well as passengers better served.

These solutions address cabin and cockpit priorities, airport security, air traffic, fleet maintenance and environmental needs. Thales's commitment to innovation is the cornerstone of its aerospace activities, leading to synergies in key areas such as simulation, avionics and air traffic management.

Thales's solutions are onboard today's most cutting-edge platforms and future aircraft. As a long-standing Airbus partner, Thales is the main supplier of the A380's cockpit display systems – its technology can be found throughout the aircraft's avionics system, covering navigation, flight controls, electrical power systems and utilities such as braking systems and door management systems. Within the cabin, the company provides state-of-the-art lighting systems and the option of its TopSeries In-Flight Entertainment (IFE) system.

Airbus in addition has selected Thales to provide a major package of avionics and cockpit systems for its new long-range, wide-body A350 XWB aircraft, scheduled to enter service in 2013. Thales's solutions onboard this platform include the Integrated Modular Avionics (IMA) suite, the Interactive Control and Display Systems and the Air Data and Inertial Reference Unit (ADIRU).

Thales has also contributed to making the Boeing 787 a cutting-edge mid-sized jet of the future. Its systems onboard this aircraft include the Integrated Standby Flight Instrument, as well as IFE and electrical power conversion systems to power the vast array of consumer systems onboard.

Key featured solutions

Head-Up Display

Thales is displaying its Head-Up Display (HUD) at the Singapore Airshow. This system has made its first appearance on an A380 with the entry into service in November 2009 of this aircraft with Air France, the first airline to select the Thales HUD (in dual configuration) for this aircraft type.

The HUD increases pilot situational awareness by creating the conditions for a smoother transition from head down to head up. This feature is particularly advantageous during approach and landing phases, when it displays trajectory related symbols superimposed on the pilot's actual external view.

The new Thales HUD is based on innovative and proven technologies and is already available as a catalogue option on Airbus Single Aisle and A380 aircraft families in current production. The European Aviation Safety Agency certified the Thales HUD on the A380 in both single (left seat only) and dual (left and right seat) configurations. Other Thales A380 HUD customers include China Southern Airlines and Korean Air.



HUD on iDeck

In-Flight Entertainment

Thales is a world leader in the field of high performance In-Flight Entertainment (IFE) systems – which it will also be demonstrating at the Singapore Airshow - and has been selected by over 50 airlines for use on 1,000 aircraft around the globe.

Korean Air and JAL are some of the major customers for this system in Asia. Thales also has wide coverage of the Chinese market, providing the IFE systems for Hainan Airlines, China Southern, China Eastern and Air China.

Beyond Asia, customers include airlines such as British Airways, Saudi Arabian airlines, Etihad, Air Canada and Air France.

The Thales TopSeries is the first such system in the industry to be able to integrate broadband communications, on-demand entertainment (music and movies) and in-seat power to accommodate personal electronic devices.



IFE

The system works as an “intranet” onboard an aircraft with digital servers that store terabytes of data, Ethernet networks throughout the cabin, seat equipment that includes passenger monitor displays and entertainment control units to navigate through the menu options. Thales’s third generation TopSeries also includes 3D capabilities.

Passengers may now also access the Internet and use their mobile phones during flights thanks to Thales Top Connect products, which are associated with the company’s IFE system.

Civil Aerospace Services

Thales is dedicated to customer satisfaction and offers a comprehensive range of customer support and services for commercial avionics and IFE. From any point in the world, Thales can provide support 7 days a week and 24 hours a day.

Thales’s services include maintenance and spares support services, aircraft on-the-ground support, LRU services, upgrade and retrofit services, logistics solutions and training services.

Thales is also a founding member of OEMServices, a joint venture company created by Diehl Aerospace, Zodiac, Liebherr-Aerospace and Thales ahead of the entry into service of the A380. The company aims to provide airlines with a single interface for logistics and support services. OEMServices has been selected by Singapore Airlines to provide A380-800 component support services under a fourteen-year agreement.

Simulation

Thales is one of few companies worldwide that build full flight simulators for airline and military training. It was the first manufacturer to supply an A380 Full Flight Simulator (FFS) to an airline.

A Thales FFS is being used to train A380 pilots for Singapore Airlines, which was the launch customer for this aircraft.

The Thales FFS is supplied with a flight crew debrief system, an instructor operating station and external taxi aid camera system. The simulator has been supplied with the PC Based EP1000 and EP10 visual system. Thales has successfully integrated several new innovative aircraft systems including the Aircraft Environment Surveillance System (AESS) and Network Server System (NSS).

Thales has also supplied an A380 configured Thales Formation Systems Trainer (TFST). The TFST is a lower level training device for aircraft systems training, providing full aircraft systems simulation fidelity in the classroom. The performance exactly replicates the aircraft by using approved aircraft avionics vendors’ software and full fidelity aircraft systems simulation models.

Navigation aids and airport solutions

Thales is a market leader in navigation aids. The company offers a complete range of nav aids for takeoff and landing, en-route and tactical navigation systems and satellite navigation systems.

Today, Thales equips more than 180 countries and has captured over 60% of the world market, including 90% of the landing systems market in the United States.

Foreign Object Debris – FOD

FODetect provides airports with the most advanced and effective system available today for continuous detection of runway and taxiway debris. A centralised data processing system detects debris, generates alerts and provides tools to investigate detections – ensuring a rapid response to FOD events. FODetect’s unique distributed architecture leverages existing runway and taxiway infrastructure for power and communications.

Small, rugged multisensor units, based on radar and electro-optic technology, are integrated with runway edge lights or installed close to the runway edge.

FOD is currently under evaluation at Boston Logan International Airport.



Airport Solutions

Airport Security

Hypervisor

The world's airports now handle a total of four billion passengers every year. The largest individual airports now handle up to 200,000 people each day, and are the size of small cities with sites that cover tens of square kilometres.

Airports present a unique control challenge. Thales already addresses the need for security in some of the world's busiest and most complex international airports, including Doha in Qatar and Dubai in the United Arab Emirates. And it is building on this expertise with Hypervisor, a new control centre architecture for large and complex sites.

Transforming supervision

Many airports lack an overarching security control framework. When an incident occurs today, the problem is being able to understand what happens, to communicate and work together to resolve the incident. What's needed is a shared situation awareness and the ability to co-ordinate actions.

Hypervisor's open architecture makes it possible to transform security management to successfully create a knowledge advantage for airport operators and security stakeholders with a clear situational awareness.

Hypervisor detects, identifies, qualifies and locates an incident. It does so by harnessing existing systems such as video surveillance, access control, passenger information, intrusion and fire detection, which Thales integrates into a network centric environment. Synthesising this data provides the capacity to monitor and manage situations.

Data exchange

The internal hierarchy of airports varies enormously between different jurisdictions. Airport operators, security forces, government agencies, first responders and airline companies all have different supervision needs.

Hypervisor meets those needs, while allowing stakeholders to maintain their functional independence. "Our role is to facilitate the customer's need to exchange information with other institutions, other departments, other terminals and even other airports. People need to be able to exchange information, not change their missions.

To create the right system for each customer, Thales has developed a new methodology, called

Thales IDEA – Identify, Develop, Experiment, Assess. The right consultative approach is essential for embedding the appropriate processes in the solution.

The need to know

Hypervisor meets a wide range of critical needs. In the event of a crisis, for example, it allows stakeholders to share the same vision with a readily understandable human-machine interface (HMI).

It also speeds-up event resolution by drawing on parallel actions to reduce lead time. It is much more efficient to send in the fire brigade and police to resolve a situation simultaneously. Hypervisor provides this capacity to orchestrate responses.

Hypervisor also enhances the efficiency of day-to-day operations. Better automation of routine actions means it is possible to handle greater numbers of passengers with the same infrastructure.

Efficient supervision reduces operator workload, which was important staffing implications. Operators have the option to re-allocate supervisory manpower to provide more passenger-facing services, such as screening.

And Hypervisor has important implications for operations beyond airport security. The solution makes it possible to orchestrate information in different forms from a wide range of sources. As such, it could provide the foundations for seamless co-ordination of airport operations amongst airport operators, air traffic control and ground handlers.

Global Leadership

Thales's supervision solutions play a critical role in the protection of people and assets around the world.

Key implementations include:

- Doha International Airport - Qatar
- Dubai International Airport - United Arab Emirates
- King Shaka International Airport – South Africa
- Fleury-Merogis Prison - France
- Mairie de Paris - France
- Port of Saint-Nazaire - France
- French Ministry of Finance – France
- National Oil Company - Saudi Arabia

Air Traffic Solutions

ADS-B & Multilateration

ADS-B is a data link application for airspace surveillance and management. Aircraft periodically broadcasts data such as identification, position, altitude, velocity, intent and status.

Multilateration uses the signals from existing aircraft transponders to track and identify aircraft on the airport surface or in the air. It enables performance similar to ADS-B without new aircraft avionics.

ADS-B FAA contract:

On August 30 2007, a team led by ITT received the FAA's award for the ADS-B contract, a major milestone in the FAA's plans for a comprehensive modernisation of the US air traffic management system. Under the contract, Thales is responsible for the supply and life-cycle support of ADSB radios for the ITT team.

Thales has been a leader in development of ADS-B and multilateration systems including the implementation of the first countrywide ADS-B system for Airservices Australia in 2004.

Thales was also awarded a contract by Eurocontrol in 2005 for deployment of ADS-B systems in Europe including the first multichannel ADS-B system.

In 2008, Thales delivered 19 additional ADS-B ground stations to complete the Indonesia country-wide ADS-B system. A Thales system is operational at Milan Linate airport for surface multilateration. Additional contracts have been secured for surface multilateration at Helsinki, Abu Dhabi and Taiwan, as well as wide area multilateration at Frankfurt.

Force & Homeland Protection

Air Defence Systems

To defeat the large range of new threats proliferating in the world today, Thales proposes flexible, optimised and integrated systems capable of dealing with any type of threat from very short to short-range.

Shikra – Surveillance radar and Coordination

Shikra is the backbone of the Thales Ground Based Air Defence solution.

Shikra is composed of high performing 3D Multibeam radar associated with an embedded or remote located Engagement Control Station. Shikra radar provides a complete air space surveillance in a very large area: range up to 250 km, ceiling up to 25 000m.



Shikra is designed to detect all types of targets, combat aircraft, helicopters, UAVs, including the most advanced, high-maneuvring low observable stealth threats. Shikra radar can track 200 targets simultaneously in hostile environments characterised by ground, sea surface, rain and artificial clutter and in severe Electronic Counter Measure conditions.

The Shikra further stands apart from its rivals due to its compact design, great flexibility, high tactical and strategic mobility, as well as high availability, easy maintenance and low life cycle cost.

The main technical differentiators that contribute to the Shikra's superlative performance are solid-state transmitter, specific data processing, very low-altitude detection capacities and the use of full-stacked beam technologies.

Air Surveillance

Ground Master 400 - a new generation of air defence radars

The Ground Master is a family of versatile, multi-mission air defence radars, dedicated to the protection of key assets and forces deployed in remote theatres. This series of static and mobile radars provides complete air defence protection with a range of 400 km. ThalesRaytheonSystems delivers integrated systems. Its Ground Master family of radars can be delivered as simple radar systems to be integrated with existing command and control centres (C2) or with their own integrated command and control centre (radar + communications + command and control centre).

At the top-end of the Ground Master family, with its unique digital and redundant architecture, the Ground Master 400 radar is the most reliable and compact long-range radar on the market. This radar offers the highest operational availability, a highly simplified maintenance, and the most compact design, making it easily deployable for remote operations. This enables minimum transport aircraft rotations from the national territory to the operational theatre.

The GM 400 is a commercial success. So far, 18 GM 400 have been sold to five countries. In 2008, ThalesRaytheonSystems bolstered its vanguard position in the air defence radar field, winning several key contracts. These include providing the latest Ground Master 400 digital air defence radar to customers in Slovenia, Malaysia and France.

In April 2009, ThalesRaytheonSystems was selected to deliver medium range Air Surveillance Systems including 14 Ground Master 400 radar systems, 12 for Finland and two for Estonia.



Ground Master 400

Missile Systems

Thales's missile business has a growing range of innovative missiles for the short-range and tactical arenas. It also provides a wealth of experience in the design and integration of launch platforms.

Air defence has been the traditional mainstay of the Thales missile business, which is maintained through its Starstreak Mk2 and VT1 missiles. With the introduction of the LMM (Lightweight Multi-role Missile), and development with Saab of the NLAW (Next-generation Light Attack Weapon), the company has applied its expertise to the precision attack of surface targets.

Thales is also a leading player in the development of non-lethal weapons.

In the surface attack arena, Thales has drawn on its expertise with high-velocity air defence weapons to develop the **LMM**. Based on the Starstreak, LMM has a unitary warhead in place of the air defence missile's three-dart system, and a guidance system optimised for high precision.

LMM offers customers a missile with high precision but very low collateral damage properties, ideal for use in urban conflicts. It is available at greatly reduced cost when compared with current systems such as Hellfire or Spike.

The Thales LMM has numerous applications, and will expand into a family of related weapons for numerous roles. It has already been trialled on fixed-wing (BAE Systems Fury) and rotary-wing (Schiebel Camcopter) UAVs, and has been selected for integration with the Augusta Westland Lynx Wildcat battlefield helicopter. Surface-to surface applications are being studied, both on land and at sea.



LMM

Close Air Support

TYR - Laser Target Designator and Imager

TYR is a compact and low mass (<5kg) integrated laser spot camera. It can be deployed very quickly and is highly reliable for both day and night operations.

The TYR operates in standalone applications, with forward observation sensor equipment, dismounted soldier or vehicle-mounted platforms. The TYR designates, ranges and provides images of the laser spot on the target to allow laser-guided munitions to be accurately deployed, thus minimising collateral damage and enhancing the probability of success.



TYR

Airborne Maritime Surveillance & Patrol

Thales is an industry-leading supplier of mission, surveillance and reconnaissance systems. These include, among others, UAV (Unmanned Aerial Vehicle) solutions as well as Maritime Surveillance and Patrol Systems.

Unmanned Aerial Vehicles (UAVs)

Thales is at the forefront of innovation in Unmanned Aerial Vehicle (UAV) systems, for which it has designed a full range of sensor payloads, data-links and mission systems. It is prime system integrator of the UK's Watchkeeper programme, a highly sophisticated tactical Intelligence Surveillance, Target Acquisition and Reconnaissance (ISTAR) system that is currently Europe's largest UAV programme.

Schiebel has selected Thales to support it in the management of VTOL (Vertical Takeoff and Landing) UAV system trials for the French Defence Procurement Agency (DGA). Thales has secured its position as a key partner in Unmanned Airborne Systems by drawing on its parallel expertise in airworthiness and flight certification. The DGA selected Schiebel's Camcopter S-100 UAV for a series of trials to assess the operational advantages of such systems. The tests are set to take place on a Camcopter S-100 fitted with a Thales Agile 2 Electro Optical and Infra Red (EO/IR) payload.

Thales is also a driving force in the emergence of collaborative projects in this domain. These include WIMAAS (Wide Maritime Area Airborne Surveillance), which is intended to facilitate the exchange and fusion of data between passive and active assets, as well as numerous research programmes on the insertion of UAVs into civil airspace. Among these programmes are ASTRAEA (UK) and MIDCAS (Europe), which is studying sense & avoid or SIGAT for the purpose of defining the appropriate radio spectrum pertaining to command and control and payload data links for future UAS integration into general air traffic.

Maritime Surveillance and Patrol Systems

Thales's solutions cover the whole spectrum of maritime surveillance and patrol requirements. These products range from maritime surveillance radars, to systems for passive electronic and optronic detection, as well as to communication systems and defence aid subsystems.

Several armed forces worldwide have selected Thales as a prime contractor of maritime patrol and surveillance systems.

The Meltem programme

Thales is supplying 19 maritime systems for Turkey's Navy and Coast Guard as part of the Meltem programme, Europe's largest maritime surveillance programme. Nine systems will be integrated into existing CN235 aircraft operated by Turkish armed forces and a further 10 into Alenia ATR72. The Thales solution is based on AMASCOS (Airborne MARitime Situation and Control System).

AMASCOS Maritime Surveillance System

Thales will be displaying its AMASCOS mission system, which is already in service with the maritime forces of several countries. AMASCOS can be tailored to the specific needs of these operational users. This system is designed for all types of aircraft and combines a powerful tactical command subsystem with the latest-generation sensor suites to ensure the success of maritime surveillance missions.



The modular architecture of the AMASCOS system makes it possible to incorporate any combination of sensors, including radars, an acoustic subsystem and data-links, as selected by the customer.

AMASCOS has been chosen in different versions to equip UAE, Turkish, Indonesian, Japanese, Pakistani and Malaysian Forces.