FACT SHEET

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Airbus A380: Hamilton Sundstrand Content

Program Background

- Program Launch: June 2000
- First Order: March 2001 (Qantas)
- First Flight: April 27, 2005
- Entry-Into-Service: Oct. 25, 2007 (Singapore Airlines)
- 234 total orders
- 47 aircraft delivered to date (Korean Air – 1, Air France – 4, Emirates – 15, Lufthansa – 6, Qantas – 10, Singapore Airlines - 11)
- Backlog: 187 aircraft

About the Aircraft

The Airbus A380-800 is the world's largest commercial airplane, designed to carry 525 passengers, in a three-class configuration, on routes up to 8,200 nautical miles (15,200 kilometers).

This Superjumbo aircraft features:

- Double deck, wide body, four engine configuration
- The A380 is 293 feet long, 79 feet tall and features a wing span of 261 feet, which covers an area of 9,100 square feet
- Four main engines with a 9-foot, 8-inch fan diameter. Engine selection is Engine Alliance GP7200 (General Electric and Pratt & Whitney) or Rolls-Royce Trent 900.
- One nose and three main landing gear with a total of 22 wheels (four more than a Boeing 747)
- Same cockpit configuration as the Airbus A320, A330 and A340 aircraft

Major structural sections of the A380 are built in France, Germany, Spain and the United Kingdom, and are brought to the new Airbus A380 assembly hall in Toulouse, France, which features one wing-to-body join assembly bay, and eight final assembly bays. The green aircraft is then ferried to the final completion center in Hamburg, Germany, for interior installation and painting.

A380 components are provided by suppliers from around the world; the five largest contributors, by value, are General Electric, Goodrich, Rolls-Royce, SAFRAN, and United Technologies Corp.

The A380 is formally certified by EASA and FAA to carry up to 853 passengers (in a single class configuration).

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Hamilton Sundstrand provides 13 systems and major components for the A380:

Air Generation System (AGS): The AGS provides heating and cooling for the entire airplane passenger cabin, flight deck, cargo bays and avionics equipment bay. The heart of the system is two pneumatically-driven air

conditioning packs, or Air Generation Units (AGUs) that produce a total of 752 KBTU/hour cooling, or 62 tons of cooling -- enough to cool more than 67 typical New England homes.

Cabin Pressurization and Control System (CPCS): The A380 CPCS controls the air pressure in the cabin and the rate of air exchange to give maximum passenger comfort and safety. The system includes four outflow valves that regulate the cabin altitude to no more than 7,000 feet while flying up to 41,000 feet.

Ventilation Control System (VCS): The A380 VCS regulates the flow of fresh and re-circulated air. It also regulates air temperature control throughout the three main decks of the pressurized fuselage: the mid-deck, upper-deck, and cargo bays. This system includes the individual outlets located above each passenger seat row, which are adjustable in airflow and direction.

Avionics Ventilation System (AVS): The A380 AVS consists of two independent circuits, right and left hand, that control and regulate the flow of cooling air from the AGUs to the cockpit panels, avionics equipment racks, primary power center, and the upper deck electrical equipment bay for cooling of electronic equipment. The system then finally discharges the air outside the airplane through a cabin outflow valve.

Auxiliary Power Unit (APU): The APU comprises the Auxiliary Power Unit (APU), the electronic control box (ECB), and mounting hardware. The PW 980A APU is the world's most powerful APU, providing 1,800 horsepower, which is 20 percent more powerful than the largest existing APU in service. The primary function of the APU is to provide air to power the AGS on the ground and to start the engines. The APU also provides auxiliary electric power to the aircraft via two 120 kVA electric generators. The APU received type certification on Dec. 5, 2006.

Ram Air Turbine (RAT): The RAT provides emergency power in the unlikely event of a complete loss of engine power. The A380 RAT is the largest ever built and features a 64 inch diameter propeller that is deployed into the air stream from the wing fairing to power its 70 kVA air-cooled generator. Sufficient emergency power is provided to maintain control of the aircraft and to deploy flaps and landing gear for a safe landing. To date, Hamilton Sundstrand RATs are responsible for saving more than 1,600 lives.

Side-Stick Controllers: More than 20 years ago, Airbus was first to introduce fully digital fly-by-wire (FBW) flight control in a civil airliner with the first flight of the A320. Airbus' cockpits feature side-stick controllers as opposed to traditional "yoke and column" pilot controls. Hamilton Sundstrand, through its Ratier-Figeac subsidiary, has built the side-stick controller for every Airbus aircraft -- a total of 8,500 units to date. The A380 side-stick features a side-stick transducer and damper unit that provides the pilot with "evolutive" feel feedback for a more natural feel of flying the aircraft.

Throttle Control Assembly (TCA): The A380 TCA controls the airplane's total 300,000 lbs. of thrust from the four main engines. The A380 TCA features a new "plug-in" modular design that's easily installed, or removed. The A380 TCA design is based on four independent modules for improved reliability and lower weight.

Trimmable Horizontal Stabilizer Actuator (THSA): The A380 THSA is a flight critical component that controls the angle of the A380's horizontal stabilizer. The horizontal stabilizer is active during take-off and landing to adjust the pitch of the aircraft (nose up/nose down) and keeps the airplane level during horizontal flight. The THSA is powered from its hydraulic motors or an electric motor backup channel. To put the size of the airplane and THSA in perspective, the A380's vertical stabilizer has the area of an A320 wing and the new airplane's horizontal stabilizer is equivalent to a pair of A310 wings. Moving the horizontal stabilizer requires a powerful actuator. The A380 THSA, the largest ever built, is more than 9.5 feet long and provides up to 128,000 lbs. maximum operating force.

Overheat Detection System: Hamilton Sundstrand's Kidde Aerospace & Defense unit provides the overheat detection system for the A380 bleed-air system. The system is comprised of continuous linear sensors, an Overheat Detection Control Unit, and Integrated Modular Avionics (IMA) based hosted function software.

Interior Lighting Systems: The A380 interior lighting utilizes the latest Light Emitting Diode (LED) technology to provide the operators virtually maintenance-free system components. In addition, colored mood-lighting effects can be created by the LED lighting to both accentuate and enhance the whole flying experience for the passenger. Hamilton Sundstrand, through its subsidiary Page Aerospace Group, supplies LED cockpit lighting, staircase and cabin feature mood-lighting, signage, reading lights and service lights throughout the aircraft.

Fairchild Controls also chose Hamilton Sundstrand to supply four Condenser Fans and two Door Actuator Assemblies for the Supplemental Cooling System (SCS). The SCS is a cooling system that uses a liquid coolant network throughout the aircraft, for galley chilling to cool food and beverages.

Rolls-Royce also chose Hamilton Sundstrand to supply the Full Authority Digital Electronic Control (FADEC) system for its Trent 900 engine. This equipment includes the electronic engine control (EEC), fuel metering unit, (FMU), main engine fuel pump, variable stator vane actuator, and permanent magnet alternator (PMA). The Trent 900 received EASA certification in October 2004 and will enter into service with Singapore Airlines.

Engine Alliance (General Electric and Pratt & Whitney) also chose Hamilton Sundstrand to supply the gearbox module, main fuel pump, lube and scavenge pumps, and heat exchangers for its GP7200 engine, which was certified on Dec. 29, 2005 and will enter into service with Emirates Airlines in August, 2008

About Hamilton Sundstrand

With 2010 sales of $5.6 billion, Hamilton Sundstrand is headquartered in Windsor Locks, Conn. Among the world's largest suppliers of technologically advanced aerospace and industrial products, the company designs, manufactures and services aerospace systems and provides integrated system solutions for commercial, regional, corporate and military aircraft. It also is a major supplier for international space programs.

Hamilton Sundstrand is a subsidiary of United Technologies Corporation (NYSE: UTX). Based in Hartford, Conn., UTC is a diversified company that provides high-technology products and services to the aerospace and building industries.

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