

June 2009

Finmeccanica's role in the F-35 Lightning Joint Strike Fighter programme

The Joint Strike Fighter (JSF or F-35) project, that is shaping up to be the biggest industrial collaboration programme in the history of military aeronautics, has been launched in the U.S. to provide the three U.S. Air Forces (USAF, U.S. Navy and USMC) with a tactical support stealth aircraft. Given the project's operational features and industrial importance, the JSF has also attracted the attention of a number of allied countries, which have decided to participate in its development. Eight other nations, in addition to the U.S., are part of the programme: United Kingdom, Italy, the Netherlands, Canada, Australia, Turkey, Denmark and Norway.

In October 2001 Lockheed Martin was chosen as prime contractor with its F-35 aircraft, winning out over the rival F-32 submitted by Boeing. Lockheed Martin heads a consortium that includes Northrop Grumman and BAE Systems as major partners. For the engine part, two contracts were awarded by the U.S. government: the first to Pratt & Whitney (F135) and the second to General Electric and Rolls-Royce (F136).

In the first quarter of 2007 all participating nations signed the Production, Sustaining and Follow-on Development (PSFD) Memorandum of Understanding that will guide the implementation of the programme for several decades following the current System Development & Demonstration (SDD) Phase. The first aircraft is scheduled to enter into service after 2013.

Italy's role

Italy is the second largest international contributor partner for the development phase, after the U.K., as regards its economic participation. Italy has already invested in the programme with \$1,028 billions, value to be split in eleven fiscal years from 2002 and until 2012, 80% for the development of the aircraft and 20% for the engine vis-à-vis a U.K. investment of about \$2,8 billions. Italy is paying a 4% contribution to the programme's design and development phases involving the production of 22 prototypes.

Italy is expected to acquire 131 aircraft, which are set to replace the Italian air force's AMX and Tornado jets between 2014 and 2025, as well as the navy's AV-8B Plus aircraft.

Italy is also looking into building an autonomous operations and support centre for its national fleet of aircraft. This will involve the creation of a final assembly and testing line for the Italian aircraft and the aircraft for other European air forces. The Netherlands has already expressed its intention to use the Italian FACO (Final Assembly and Check-Out) for the assembly of its F-35s and it is hoped that other nations express a similar requirement.

Italy's industrial role

Finmeccanica, represented by Alenia Aeronautica and by other subsidiaries, is the key Italian industrial player in the JSF Programme and together with Avio, national leading company in the engine field, and other non-Finmeccanica companies, is planning a long-term industrial involvement to support the F-35's entire life cycle.

The Italian companies have signed with Lockheed Martin and some of its suppliers a number of agreements to define the potential areas of involvement in the SDD (Systems Development & Demonstration Phase) phase, in order to strengthen their involvement. Negotiations are under way for opportunities in the Production and Sustainment Phases.

Alenia Aeronautica's role in the programme**Development**

Alenia Aeronautica's systems, structural design, industrialisation and logistics technicians are involved in the design activities carried out by Lockheed Martin's integrated project teams (IPTs). The aim is to acquire the necessary basic skills in the areas of aircraft and mission systems to include integration and test flights, development of logistical support systems and of certain equipment/subsystems. In addition, thanks to its management capabilities and project management skills – which it has demonstrated particularly during the study for reducing the aircraft weight – Alenia Aeronautica has been given responsibility for the structural design of the half-wings of the conventional take off and landing (CTOL) and carrier-borne versions.

The design work on the JSF carried out in Pomigliano d'Arco is the only one not being carried out in the U.S. or the U.K..

For the future, Lockheed Martin and Alenia are establishing a dialogue to explore follow-on development opportunities to align with Alenia's engineering and technology expertise.

Production

Alenia Aeronautica is responsible for the production of the JSF's wing. Its production line comes as an addition to that of Lockheed Martin, and will produce components that will be sent to the final aircraft assembly line.

Based on the total number of expected orders for the aircraft, the company estimates that it will produce around 1,200 complete wings between 2014 and 2028, with delivery of high-precision components to start in 2009. Until now a first contract has been signed between Alenia Aeronautica and Lockheed Martin whereby the industrialisation activities have started at Alenia Aeronautica's Foggia and Nola plants, for the high-precision parts made respectively of composite and metal material. The JSF's wing is made up of two half-wings and two fuselage sections made of metal and composite materials which are assembled together with installation of electric and hydraulic systems.

Assembly

Thanks to a big concerted effort from industry and government, Italy has been given the opportunity to build a final assembly and testing line for the Italian version of the aircraft at the air force base at Cameri, near Novara. A new facility will be built at the base to assemble the Italian and Dutch versions of the aircraft for a total of over 200 airplanes.

All the infrastructures, machineries and equipments needed for the final assembly will be installed at Cameri. Assembly and testing will be carried out by Alenia Aeronautica in close co-operation with the Italian Air Force, allowing all parties to develop the joint experience necessary to carry out the subsequent maintenance, repair and upgrade work during the fleet's operational life.

Cameri base with its industrial infrastructure could become the hub of a European logistics centre for maintenance, repairs and upgrades of the F-35s for Italy and the Netherlands, with the possibility of extending such activities to other countries using the aircraft.

Operational/logistical support

Alenia Aeronautica will be responsible for the activities aimed at introducing national versions (systems and equipments) for the Italian JSF fleet, and will co-ordinate its logistical and operational support.

These activities will be carried out jointly with Lockheed Martin, which will retain contractual responsibility and design authority in dealing with the programme management agency. They will involve infrastructure development and high-level training for staff, including those people who will be operating at the bases that provide support activities for the Italian Armed Forces.

SELEX Galileo's role

SELEX Galileo has been part of the JSF for over three years, ever since Lockheed Martin signed the first important contract to admit the U.K. to the programme. Since then the company has won other major orders for this international programme.

SELEX Galileo's work on the electro-optical targeting system (EOTS) is proof that the Italian and U.K. teams boast a wealth of complementary expertise. The EOTS is placed under the nose of the aircraft, and can revolve 360 degrees. It is a vital component for the Joint Strike Fighter and its ability to measure distances accurately and direct its laser guided systems. The EOTS laser was designed by SELEX Galileo at its state-of-the-art facility in Edinburgh, and the first one was delivered in 2005, just 14 months after the contract was signed.

SELEX Galileo is also part of the EOTS project, initially with the vacuum cell, a sealed vessel that prevents air breakdown during laser designator system operation. This opto-mechanical unit is a sophisticated and vital part of the gimbal-mounted afocal system for visible, infrared and laser spectra. SELEX Galileo was subsequently also chosen to develop radio frequency components. This work is carried out by the company's radar systems division at its Palermo facility.

A Memorandum of Understanding between SELEX Galileo and Northrop Grumman's Electronic Systems division has been signed last July at the Farnborough Air Show and acknowledges SELEX Galileo's role as Italy's best value supplier of radar and electro-optical distributed aperture systems. Negotiations are already under way for the first phase of low rate initial production (LRIP I).

SELEX Communications' role***Development***

SELEX Communications has a key role in the JSF programme since it has won, in open competition, two contracts for which it has been assigned the role of Original Equipment Manufacturer for the Back Radio (BuR) and Landing Aids Down Converter (LADC) systems, both external to the aircraft's CNI (Communications, Navigation and Identification) Rack and part of the equipments in common to both aircraft's versions, CTOL (Conventional Take-Off and Landing), and STOVL (Short Take-Off and Landing), and thus indistinctly necessary to the whole fleet.

SELEX Communications has won in 2003 the bid for the development of BuR, UHF radio system, necessary in emergency cases to assure communication, but also with Primary Radio functions in the event of special conditions in the most critical missions. The programme has already concluded successfully and on schedule the SDD phase passing the First Article Inspection in January 2007 and has already delivered 20 pre-series systems to the customer.

In March 2007 SELEX Communications has been awarded the contract for the development of LADC, landing air converter, critical from the point view of environment, since it is fixed inside the front landing gear, that remains open in the take-off and landing phases.

SIRIO PANEL in November 2003 has been awarded, together with Lockheed Martin Aeronautics, the development contract for the Cockpit Panels and Lighting System that will equip all three aircraft's versions for all nations participating in the programme.

The system is an essential part of the interface between pilots and aircraft's general systems.

The systems' structures are based on the most modern LED technologies, compatible with the night vision systems, for the backlighting of the same systems and for the cockpit's lighting.

After the development phase, concluded successfully and on schedule, SIRIO PANEL has currently under production systems for the programme's LRIP 1 and 2 phases.

Production

SELEX Communications has signed a Lol with Northrop Grumman Integrated Systems, Network Communications Division of San Diego for BuR's Full Production for 2,581 shipsets.

In December 2007 the first contract for the low-rate production of BuR (Low Rate Initial Production – LRIP Lot 1 and Lot 2) has been signed.

The production contract for LRIP Lot 3 is expected for May '09. Next June '09 a BuR will make the first flight onboard a JSF prototype.

As for LADC in December '07 the contract has been signed for the first low-rate batches (LRIP 1 and 2) and the contract for LRIP 3 is expected for May '09.

Letters of Intents have been signed since 2004 for the production of 2,581 shipsets in second source of JSF CNI Rack's Components, called UVPS and UVPA, a Pre-Selector and a power amplifier in UHF/VHF.

SELEX Communications has as customer for all the above-mentioned production items NGIS NCD of San Diego in California, USA.

SELEX Communications and NG IS NCD are at present under negotiations with LM and FNM for the achievement of opportunities and additional contracts regarding further CNI's Components, already partially identified (LBPA, DCTR, ACE, CNI Power Supply Cards).

Operational Support

SELEX Communications has been selected by Lockheed Martin as reference Italian company for the activities of support to the assessment of Link 16, VMF and SATCOM interoperability between JSF and some national assets potentially cooperating with it. To this end Lockheed Martin has sent a RFP by Lockheed Martin and SELEX Communications has issued the relative offer.

Autonomic Logistic Global Sustainment

SELEX Communications, in coordination with Alenia Aeronautica and Finmeccanica, proposes itself as excellence company for the ALGS activities as regards CNI, within the activities to be defined in support of the FACO role, meeting both National and Regional requirements.