

POWER SUPPLY SYSTEMS ON THE PLANE

Fossil fuel will soon end, and fly people are already accustomed, the more so without airplanes to overcome long distances in a short period of time is impossible. In recent years, the rate of consumption of natural resources has increased, which may lead to natural famine. This is especially true of non-renewable resources - mineral raw materials and fuel, which currently operate aircraft engines. Therefore, to solve this problem it is necessary to switch to alternative energy - electric.

The aerospace industry is gradually preparing to switch to electric motors, but in the hybrid version. Because airplanes with electric motors can not lift a large load. Modern batteries and close to can not be compared with the energy density of chemical fuel. For example, in lithium-ion batteries, the energy density is 100-150 W * h / kg, in lithium polymer - 150-200 W * h / kg. For comparison, in gasoline - 11000 W * h / kg, in hydrogen - 33000 W * h / kg. Since fully electric planes can not carry a large number of passengers then, for the beginning, you must use both energies consistently.

Three companies: Airbus, Rolls-Royce and Siemens have formed a partnership to develop a hybrid engine demonstration, whose first flight is expected in 2020 (Fig. 1). As a test bench, BAe 146, a medium sized commercial jet aircraft manufactured by British Aerospace in 1983-2003, was used. During testing, one of its turbo-fan Jet engines BAe 146 is replaced by a two-megawatt Siemens electric motor. When the system promises its viability, an attempt will be made to replace another "turbine".

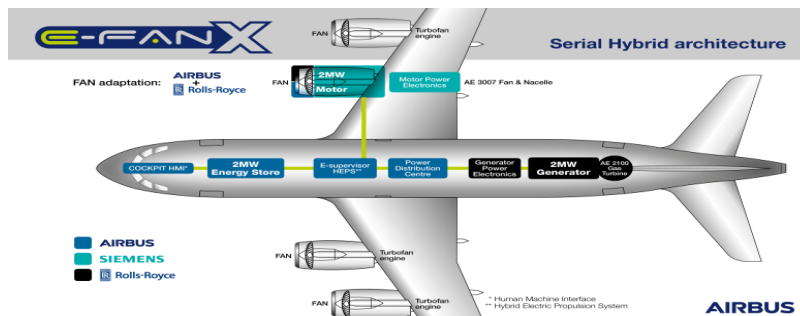


Fig.1 Model of hybrid electric demonstration aircraft E-Fan X

Each company in the alliance carries out its work and is responsible for it. Airbus is responsible for the overall integration of all components, the hybrid electric system and battery management system, as well as the integration with flight management. Rolls-Royce will provide a turbocharged turbocharged engine, two megawatt generator and electronics power system. Together with Airbus, they will work on adapting the fan to an existing gondola and Siemens electric motor. Accordingly, Siemens will provide a two-megawatt electric motor and a power supply for it, as well as an inverter, DC-DC converter and power distribution system.

Consequently, the future of aviation - definitely for hybrid electric cars, and then for purely electric. The E-Fan X test engine will help you study the problems that arise in hybrid electric power plants of high power: thermal effects, electric traction control, height and speed effects on electrical systems, and electromagnetic compatibility problems.