

CURRENT STATUS AND PROSPECTS OF THE AVIATION INDUSTRY IN THE USA

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This article is aimed to analyse the aviation industry of the USA. It involves a considerable sector of world economy and its products are used by people at work, at home or in their free time. Introduced are new scientific discoveries that support the technical and economic growth. Aviation industry in the USA is not exception, which is taken for world power. The article analyses problems such as the aviation industry in the USA in general, current civil transport aircrafts, prospects in the aviation industry in the USA with emphasis on new materials and developments in the aviation industry.

K e y w o r d s: aircraft, aviation industry, USA

1 INTRODUCING

Aviation industry in the USA is a part of aeronautics segment and defence technic and it is necessary to perceive it in a global status, i. e. not only in the USA. This sector includes civil and military components.

Civil aviation industry is characterised by cyclic developements, because it depends on acquisition plans of airlines, which are oscillatin in times of insecurity and global security combinations.

On the military side, inquiry depends on estimating the defence government department and also on government acquisition policy, which are alternately depend on geopolitic progress and perception of global developments. The i Industry in general, is a considerable sector of world economy and its products are used by people at work, at home and in their free time. Introduction of science developments to producing and technical inventions benefits economic growth, security, products and service quality. In this case, there is not exception in aviation industry, especially in the USA, which is put down as world great power. American aviaton and cosmic industry is the most quality part of branch in electronics and engineering, it is integrator of technic informations and modern technology font.

Considerable improvement came into being in direction of aircraft systems direction, for example hydraulics, electronics, aircraft equipments, aircraft controlling systems, UAV products, communication and navigation systems.

2 ANALYSIS OF THE AVIATION INDUSTRY IN THE USA

Aviation industry is one of the strongest segment in the USA. It includes world-wide complex of producers, which produce aircrafts, helicopters, military aircrafts, rockets, cosmic ships and satellites. The segment of aviation industry is very cyclic and very sensitive on economic circle. In hard economic time, people travel less than in better time, and it doesn't mater if it is for private or bussines reason.

Factors contributing to aviation industry:

- positive global growth, contributing requests for cargo and person service of transport
- company profits, inquiry for bussines-jets, bussines trips
- faster inquiry growth in economics of expansion countries, for example India
- conflicts in countries, such as Irak, Afghanistan, which control inquiry for military equipment and services

huge investments into the new aircrafts for civil sector in reaction to enviromental issues, high oil prices (oil prices forming the biggest part of operational costs of airlines).

2.1 Progress of the US aviation market

During the year 2001, aviation industry was influenced by effects and consequences of economic decrease, such as decreasing of business trips, salaries while fuel costs were increasing.

Events from 11st of September 2001 evoked greatly problems in airlines, and that was the reason to decrease of customers and increase of operation costs. Losses were typical for another years to come. The industrial sector was in red until the year 2006, when a relatively stable period of the USA aviation started. Most of people working for aviation industry, no matter if it is civil or military sector, described the year of 2007 as one of the best years of the American industry.

Situation changed very fast, and at the end of 2008 it was clear that growth of global economy and aviation industry declined, a thing that nobody has expected. In December a decrease in international transport was about 22,6 %. International civil transport fell by about 4,6 %. Losses in the economy continued for another years. Consequently, in March 2009 the IATA declared that aviation industry in the USA obtained losses, which amounted to 2,4 mld USD for a year. At that time, Boeing and EADS declared cancellation of already existing orders, received at the beginning of the year.

Demand for aviation transport has increased in 2010. But the eruption on Island - Eyjafjallajökull volcano caused seriously losses to the European air transport. As a consequence over 100 000 flights were cancelled, having impact on over 7 millions travellers. This situation accentuated the importance of air transport in global economy. In years 2010 and 2011, the Department of Transport in the USA published and regulations for airlines, about provision of adequate services for travellers.

2.2 Current status in the US aviation industry

During the 2011, aviation industry contributed in economic sector of USA, a sum of 86 mld USD, and it supported USA market. American aviation market is a huge invitation for foreign companies, because it is the biggest market in the world and it features competent manpower, extensive distributive systems, strong support in

national and international rank for politics and advertising of products.

The aviation sector of the US industry supports more work places than other sectors in this country. It employs 500 000 people in scientific and technical careers at all country and supports more than 700 000 employees in domains coherent with the aviation industry. American capital assets of the aviation industry are based on y with well-grounded mechanical and air engineers and other employees who are experienced in the aviation industry.

Industry forecasting suggest that growth of large commercial aircrafts during next 20 years will be 3,5 % for a year, it means 34 000 aircrafts in prices 4,5 millions of USD.

3 CURRENT CIVIL TRANSPORT AIRCRAFTS IN THE USA

The Boeing Company is the most popular company in aviation industry in the USA. In this case I have selected aircrafts known world wide for comparison.

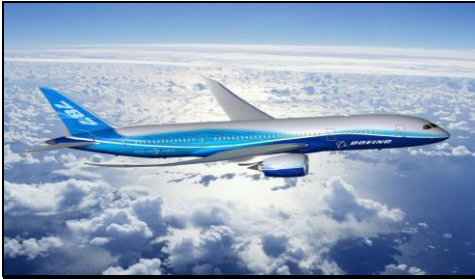
3.1 Boeing 787 Dreamliner

Production and tests of B787 Dreamliner were affected by problems from the beginning. It caused adjournment of introductory take-off, certification and the most of all delivery to customers. Boeing's directory confessed, that model B787 Dreamliner has had defects on composite construction. Defects have been urgently cleared at these models that were delivered to their customers, but also on these aircrafts which are still in producing. The main problem, as it is habit in a lot of cases, is implementation of new constructional materials, such as composites.

3.1.1 Problems with batteries

Problems with batteries caused the call-back of more than 50 aircrafts from operation. Battery started to burn in aircraft at the Boston airport and another aircraft, which had the same problem, was equity of Japan company, All

Nippon Airways, must forced land because of steamer battery. Dreamliners were called-back from the sky by Japan airlines, and at the half of January. Boeing at the moment started with problems eliminating and still making on model B787. 25th of March 2013 was realized first experimental flight with new batteries, the aircraft was flying over 2 hours with no problems.



Obr. 1 Boeing 787 Dreamliner

Boeing directory is trying to capture acceptance from FAA for compensation old batteries with new ones. New batteries arrection wasn't aborted, so aircrafts are still waiting for implementation new batteries and customers will have allow to recieve them. FAA gave to Boeing acceptance to make changes in construction in batteries. Their sections are izolated better between each other, that minimalized risk of short circuit.

Definitive test of new batteries in the B787 Dreamliner was realized 5th of April 2013. Aircraft with logo of poland airline LOT was equipped by batteries of new construction. In the sky was this aircraft during 109 minutes and then it safely landed on airport. Boeing is at the moment waiting for FAA's opinion, which has to tell to operation abilities. If FAA allow Dreamliner's operation with new batteries, they will have start to fly again.

3.2 Boeing 737 MAX

Identification „MAX“ hasn't been chosen accidentally. New aircrafts offer their customers and travellers maximum of comfort, operation effectivity and responsibility. During the project, constructor used new composite materials of modern technology.

The numbers of offered versions have to be 3. Their construction follows from the „next

generation“ B737: MAX 7 model based on model -700, MAX 8 and model (737-800), on MAX 9 (737-900 ER). Characteristic look of aircrafts are basically the same but changes will in the tail planes passed from the B787.



Obr. 2 Boeing 737 MAX

Prefabrication of the new components will need construction of modifications, which must ensure minimum of engine height beyond the ground in 42,9 cm. Cabin of aircraft is equipped with „Sky interior“, coloured LED lighting ensures maximum of space and comfort for every customer in commercial and bussines class.

One of the most important Boeing's aims, is notified in decreasing of fuel mileage at about 16 %.

4 PROSPECTS OF THE US AVIATION INDUSTRY

Inovative methods and long air tradition are main marks of aviation industry development, in the sector of commercial and military aircrafts, which are used to their benefits. Producers of civil aircrafts are sill trying to make better products and services, because of increased customer's requirements.

Export is an important part of the American economy and Boeing is proud of that he is one of the top subjects of foreign sales. Company creates work places, that composes an important part to economy consolidation.

Competetive and inovation of american industry were always based on introduction new trends and revolutionary products for industry. American companies are perfect example, with using inovative composite materials, that are economized to fuel mileage and they have low

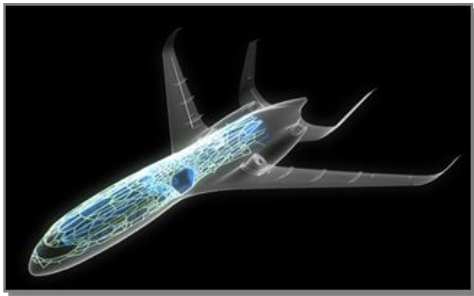
level of noise, which is positive to comfortable travelling.

Airlines are trying to contribute to better environment status of their products such as bio-fuel and solar Technologies. Their aim is to produce competitive new products, which has lower effect to environment. The news show, that aircrafts produce about 70 % less carbon oxide than aircrafts from year 1960.

4.1 Concept of the new aircraft

Basis of the new aircraft is created from composite and light alloys, its cross-section offers for travelers more space, very fast ability of cabin configuration for carrying agents, by actual requirements, what we can see on picture no.16. The back side has character as „U“, it secures needed stability in different phases of flight.

Efficient engines have to be installed on ultra-long wings by sides, with low expenditure of fuel, low footprint of carbon oxide and noise.



Obr. 3 Conception of the new aircraft

At large civil aircrafts, solar energy will be limited, because it will be used for small aircrafts. Cabin electricity composed from modern materials, will be integrated to the bionic construction, and it will economize weight and numbers of nowadays standard kilometers.

4.2 Nano-fibres

The first project in Aerospace sector, between american company, Boeing and Istanbul Technical University Launch will inquire advantages of air filtration for better breathing conditions on a aircraft's board. It's an inovative design feature in the aviation industry.

The project is a typical example of american companies and airlines working in inovative methods for better conditions in commercial aircrafts. They are proceeding from customer experiences, when comfort during the flight is one of the priority requirements. Co-operation with talented students from different universities are considered a good way towards successful realization of the project. The Istanbul University has lauched a strong investigation programe in the field of nano-materials for the aviation industry.

4.3 Bio-fuels

Environmental protection is the most actual phenomenon of these times. Aviation influences by damaging emissions, produced by aircraft engines.

IATA, International Air Transport Association, the same as big companies (Boeing, Airbus, Bombardier, Embraer...) is supporting investigation, development and using of modern alternative types of fuel. Trying all the areas, is decreasing the damaging emissions of carbon oxide into the year 2050 and 50% to compared with previous year of 2012.

4.4 Laser-phoenix in the air

Improvement of air transport and aviation industry have not only just assertive impact on progress, but there are a lot of situations which are dangerous for the aircrew, aircraft and passangers. Nowadays, a lot of countries are becoming victims of the new phoenix – laser attack.

Lasers are very available at the free market, which have impact onto the increasing of attacks. Adepts, government departments, national institutes, lawyers still work on measures intensely, for better situations to divert dangerous.

5 CONCLUSION

American aviation industry is one of the most various, dynamic, developing sectors in field of air transport on the world. There is an economic

circle highly sensitive to the growth of economic. Changes cannot be predicted very often. The affect the aviation industry, no matter if in positive or negative way. Changes compose an important part of aviation industry, of course, it is reflected on the health of the global economy.

Aviation industry development has gone through a lot of changes from aircraft construction, capacity formats, increasing of comfort on the aircraft board, navigation systems, meteorologic systems, signalization systems, which are still producing from new materials. It tries to bring maximum safety and accessibility for customers with the aim to increase the extent of products and services.

Static growth of American aviation industry is still expected. It can be seen on huge influence exerted upon this sector. Aviation industry is still asking for technological improvements to insure better systems used in aviation and aircrafts to outperform in operations.

In case of the environment, we can say that it is the one of the most important issues of aviation industry. A lot of aircrafts use this alternative bio-fuel, which produces much less emissions of the carbon oxide into the air. Research teams co-operate between each other to achieve adequate levels, in terms of providing power to engines.

I would like to say, that ecological flying will be, in the future, at a minimum level of damaging emissions, as it is in situation of eco-automobiles using electrical energy to drive.

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