

DEVELOPMENT, SALES AND SERVICE OF LARGE TRANSPORT AIRCRAFTS

Tomáš Pastír – Lucia Melníková

Main goal of this article is to inform professional public and those interested in air traffic about the development, sale and operation of large transport aircrafts. In the individual chapters are briefly described stages of development and sales, the introduction into the operations with the operating airlines. Orders and deliveries are shown in the figures which show the need for large aircrafts in the airlines all around the world

K e y w o r d s: large transport aircraft, Boeing, Airbus, aircraft manufacturers, airlines, business strategy

1 INTRODUCTION

Aviation radically shortened distances between the cities all around the world and opened new horizons for travelers. However, aircrafts did not provide so much comfort to travelers until these days. Especially on the international flights where time spent in the cabin usually exceeds few hours and space for comfort is significantly limited, passengers felt very discomforted. The second problem is the capacity of the airspace, which is often saturated on many places. Also limited capacity of an airports, where is no further space for their expansion and all of the available slots for dispatch of the aircrafts are hopelessly occupied on several international airports, are sufficient facts for finding new solutions. A significant problem is also the economics of air transport operations by itself. With continuous increase of the fuel costs are airlines forced to find a new solutions to maintain their competitiveness of offered products. After analysis of these facts airlines together with engineers and airline manufacturers were looking for solutions which should flexibly respond to demand of the global market. For partial mitigation of the challenges mentioned above significantly contributed a development of large aircrafts, their construction and subsequent inclusion to commercial use. After successful fulfillment of certification conditions with the introduction of new types of airplanes is now clear that the development slid by right direction.

2 NEEDS FOR LARGE AIRCRAFTS IN THE AIR TRANSPORT

Topic of the large airliners was discussed by all major aircraft manufacturers and airline companies. Research of the market shown the need for this type of aircrafts in domestic and international air transportation, particularly on long-haul distances for passengers and cargo. The way of development, construction, testing and certification process through the inclusion to the commercial use was very hard and long. First successful aviation company on this field became Boeing in 1970. With B747 Jumbo this company dominated the market of large aircrafts for more than 35 years. But nothing lasts forever.

International European consortium Airbus Industrie established itself in the 80s as another good performer on the market demanding for middle aircrafts and after while gradually extends the modular series of ever larger machines. In late 90s, Airbus evaluated that the 20 years and even older B 747s will shortly needed to be replaced and Airbus decided to develop and construct new ultra large aircraft called A3XX, which was introduced in 2006 as the Airbus A380. The new machine not only competes but also eclipsed the long-time leader among large aircraft - Boeing 747.

If we look at the predominant types of large transport aircraft on the market, we can find out that today's market is dominated by only two manufacturers - Airbus and Boeing. The battle of these two giants brings to the development and manufacturing of aircrafts healthy rivalry, which constantly improves the

quality, comfort and safety of the aviation. These so-called "*maxi - aircraft*" of these times play an irreplaceable role in fleets of large airline all around the world.

3 LARGE AIRCRAFTS OF BOEING COMPANY

The Boeing production line currently produces five types of aircraft in different versions. Large, wide-body aircrafts include models 747, 767, 777 and 787.

The latest Boeing 787 "*Dreamliner*" which became the fastest selling aircraft with orders exceeding 850 aircrafts before its maiden flight have taken the lead in the rankings against the Airbus A380. Although production of the Boeing 787 delayed by almost three years and costs increased from around 17 to 24 billion US \$, Boeing is now enjoying great success and customer's recognition. The main production program is currently focused only on this type of construction. Factories for construction of products are located in the city of Everett in the USA. Due to the large number of orders Boeing company built the second assembly line in North Charleston, South Carolina. In full production it will produce three aircraft per month. Boeing 787 with capacity of 290 passengers can not be compared to the Airbus A380 in the matter of capacity, but his comfort and economy is the attraction for customers. Historically, the earliest wide-body airplane Boeing 747 has been modernized and its latest model Boeing 747-8 strengthen position of 747's in competition with Airbus A380. Boeing 747-8 is the largest airliner from Boeing company. It was first officially unveiled in November 2005. The first flight took place on 8th February 2010. Before developing first prototype Boeing made market position survey for new aircrafts and so achieved valuable information from airlines and cargo carriers to specify their demands for the gradual enlargement of the new model and continued profitability of the current 747 fleet. Thanks to cooperation with customers and implementing new technologies in the 787 Dreamliner model,

Boeing created the 747-8 family. In fact, the designation 747-8 was chosen to demonstrate the technological connection between the new model 787 and 747.

4 LARGE AIRCRAFTS OF THE AIRBUS INDUSTRIE

Airbus is currently producing four different versions of the aircraft types. The large wide body aircraft can include models A330, A340 and A380 "superjumbo", which is the world's largest commercial aircraft to transport passengers with a maximum capacity of 853 passengers. Another large aircraft Airbus A350XWB is in the development and it is meant to be a competitor to Boeing's 787 with market entry in 2014. The production should initially used many components from the existing A330 (eg. trunk), but the great success of a brand new Boeing 787 Dreamliner and the reaction of potential customers forced the company to change the Airbus A350 project from scratch to the totally new type of transport aircraft. Model A350 will be manufactured in three versions: the A350-800, A350-900, A350-1000. Airbus presents that the operating costs of the A350XWB will be 8% lower than competing Boeing 787 Dreamliner. Double-Decked, in three-class layout with 555 seats, Airbus A380 is the most ambitious civil aircraft program in history. Since the entry into the service in March 2006 is Airbus A380 largest airplane in the world. After some initial issues and after their removal is giant Airbus commonly used by airlines all around the world.

5 CUSTOMERS

Huge types of aircrafts ordered from Airbus and Boeing are shown in the following tables according to the airlines which by the end of February 2012 ordered most aircrafts. Figure 1 is listing customers of the Airbus who ordered more than 20 of Airbus A350.

Fig. 1 Orders of the Airbus A350

Airline										
A350	QATAR AIRWAYS (QUATAR)	EMIRATES (UNITED ARAB EMIRATES)	CATHAY PACIFIC (CHINA)	ASIANA AIRLINES (SOUTH KOREA)	TAM - LINHAS AEREAS (BRAZIL)	UNITED AIRLINES (U.S.A.)	AEROFLOT (RUSSIAN FEDERATION)	US AIRWAYS (U.S.A.)	ILFC (U.S.A.)	SINGAPORE AIRLINES (SINGAPORE)
Orders	80	70	36	30	27	25	22	22	20	20
Deliveries	-	-	-	-	-	-	-	-	-	-
Unfilled	80	70	36	30	27	25	22	22	20	20

The source: own creativity

In Figure 2 listed are Airbus customers who have ordered 10 aircrafts A380 and more. With more than 90 orders is leading this figure Emirates Airlines, which already operates 21 machines. Within the European airline companies in top ten is German Lufthansa which already operates eight aircrafts from 17 orders. Air France is running behind with 12 orders and already operates 6 of them and British Airways with 12 orders total.

Fig. 2 Orders of the Airbus A380-800

Airline										
A380	EMIRATES (UNITED ARAB EMIRATES)	QANTAS AIRWAYS (AUSTRALIA)	SINGAPORE AIRLINES (SINGAPORE)	LUFTHANSA (GERMANY)	AIR FRANCE (FRANCE)	BRITISH AIRWAYS (UNITED KINGDOM)	ETIHAD AIRWAYS (UNITED ARAB EMIRATES)	HONG KONG AIRLINES (HON KONG)	KOREAN AIR (SOUTH KOREA)	QATAR AIRWAYS (QUATAR)
Orders	90	20	19	17	12	12	10	10	10	10
Deliveries	21	12	16	8	6	-	-	-	5	-
Unfilled	69	8	3	9	6	12	10	10	5	10

The source: own creativity

Figure 3 is a list of Boeing's customers who ordered more than 20 pieces of the Boeing 747 from the beginning of its production. The leader in orders of Boeing 747 is a Japanese airline All Nippon Airways with 108 aircraft ordered and delivered.

Fig. 3 Orders of the Boeing 747

Airline										
B 747	Japan Airlines (JAPAN)	British Airways (UNITED KINGDOM)	Singapore Airlines (SINGAPORE)	Lufthansa German Airlines (GERMANY)	Korean Air (SOUTH KOREA)	United Air Lines (U.S.A.)	Qantas (AUSTRALIA)	Cathay Pacific Airways (CHINA)	Air France (FRANCE)	Northwest Airlines (U.S.A.)
Orders	108	94	93	82	74	64	57	55	53	53
Deliveries	108	94	93	62	63	64	57	50	53	53
Unfilled	-	-	20	11	-	-	5	-	-	-

The source: own creativity

Orders, deliveries and unfulfilled orders of the airlines that have ordered more than 20 aircraft are shown in figure 4. Most orders were placed by U.S. leasing company ILFC with 74 pieces. Between first fifteen companies that leads ranking of Boeing 787 orders are 5 American, 6 Asian, 1 Australian and 3 European companies.

Fig. 4 Orders of the Boeing 787

Airline										
B 787	ILFC (U.S.A.)	All Nippon Airways (JAPAN)	Qantas (AUSTRALIA)	Japan Airlines (JAPAN)	Etihad Airways (UNITED ARAB EMIRATES)	Air Canada (CANADA)	Qatar Airways (QATAR)	Air India (INDIA)	LAN Airlines (CHILE)	Air France-KLM Group (FRANCE)
Orders	74	55	50	45	41	37	30	27	26	25
Deliveries	-	6	-	2	-	-	-	-	-	-
Unfilled	74	49	50	43	41	37	30	27	26	25

The source: own creativity

Total orders, deliveries and unfulfilled orders of large Boeing and Airbus aircrafts which are currently produced are shown in figure 5. The Boeing 747 is shown with the latest model 747-8, which was launched in 2010. Data is current as of end of February 2012.

Tab. 5: Total orders, deliveries and unfulfilled orders

Aircraft types	Airbus A350	Airbus A380	Boeing 747-8	Boeing 787
Olders	555	253	106	851
Deliveries	0	72	15	8
Unfilled	555	181	91	843

The source: own creativity

Figure 5 shows that the greatest demand is for the Boeing 787 Dreamliner following with the Airbus A350 which is not in use, Airbus A380 on the third place and fourth is the Boeing 747-8 with 106 orders. But the fact is that customer is more interested into twin-engine Airbus A350 and Boeing 787 within capacity of 300 seats. As shown in figure 5 is the ratio between Airbus A350 and A380 more than doubled. With the Boeing company is the ratio between 787 and 747-8 bigger more than 8 times.

6 CONCLUSION

Need for large transportation aircrafts in the air traffic is coming gradually because of the compression of air corridors, and increasing of the movement of aircraft and passengers at the airports. Air traffic market has gradually necessitated the development of newer and more modern aircrafts and huge investments into the modernization of produced versions were placed. Modern large transport aircrafts of Airbus and Boeing replaces and rejuvenates the fleet of the airlines all around the world. Manufacturers are enjoying tremendous interest of customers in new models of aircrafts, travelers are looking for safer and more comfortable travel. The airport operators are enjoying an increase in the number of travelers, which helps increase the level of airport services.

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AUTHORS' ADDRESSES

Tomáš Pastír, Ing.
 Technical University of Košice
 Faculty of Aeronautics
 Rampová 7, Košice, Slovakia
 e-mail: pastir@zbince.sk

Lucia Melníková, Ing.
Technical University of Košice
Faculty of Aeronautics
Rampová 7, Košice, Slovakia
e-mail: lucia.melnikova@tuke.sk

Reviewer: doc. Ing. Slavomír KIŠ, CSc.