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## **NEW POSSIBILITIES OF USING A-319CJ AIRCRAFT AT THE CZECH AIR FORCE**

**Summary.** The article analyses remarkable changes in activities of the transport airbase in terms of substitution of obsolete aircraft by modern transport airplanes. Further, differences between transport airbase's aircraft and Czech Airlines' airplanes are introduced, as well as fundamental tactical and operating specifications, time and space factors regarding personnel transport, supplies transport and possibilities of Airbus A319CJ's freight hold adjustment in dependence on the nature of transport.

## **NOWE MOŻLIWOŚCI UŻYWANIA SAMOLOTU A-319CJ W CZESKICH SIŁACH POWIETRZNYCH**

**Streszczenie.** Artykuł analizuje niezwykle zmiany w działalności wojskowego transportu lotniczego, w warunkach zastępowania przestarzałych samolotów przez nowoczesne samoloty transportowe. Prezentuje dalsze różnice pomiędzy wojskowymi samolotami transportowymi i Czech Airlines (Czeskie Linie Lotnicze), które są wprowadzone a dotyczą: zasadniczych taktycznych i operacyjnych specyfikacji, czasowo – przestrzennych czynników, związanych z organizacją transportu, zapewniania transportu i możliwości Airbusa A319CJ, poprzez przystosowanie go do zapewnienia transportu towarowego odpowiednio do specyfiki wojskowego transportu lotniczego.

### **1. INTRODUCTION**

The task of air transport by airliners within Czech Republic and abroad is fulfilled by the 24<sup>th</sup> Transport Airbase at Prague – Kbely. During duty alert status of the state and during emergency measures, it fulfills tasks assigned by the Minister of defence. It has been participating on the transport of constitutional representatives since 1993, unofficially since 1990. Beside that, it provides transport of transplant organs and it participates on the integrated rescue system.

The transport component of our air force has been still conducting airlift and transport missions by the Russian-made Tu-154M aircraft since the 1970's. It is true, that these aircraft belong among the most recent of its type (the last delivery was realized just a few years ago), thus both technical and period lifetime enables their operation for many years on. As far as the often-mentioned failure rate is considered, it is actually not as bad as it is commonly presented. The biggest problem of Tu-154M aircraft is its three engines, which produce enough power, so these aircraft are among the fastest airliners whatsoever, nonetheless they begin not to satisfy some important requirements for modern aircraft.

The Tu-154M aircraft have not been continuously modernized by the manufacturer since they were put into service and therefore they were taken out of service by the majority of commercial airlines (Czech Airlines incl.) because of economical reasons in the 1990's . At the present time, these aircraft are operated just by countries of the former Soviet Union and also for transportation of Slovak and Polish government representatives.

The following data are the basic tactical and technical specifications of the Tu-154M: maximum gross weight 100 000 kg, cruise speed 900 kph, cruise Mach 0.84, maximum FL 410, maximum ferry range 5 000 km with commercial load 7 000 kg (passengers and freight) or 4 000 km with 117 passengers.

The necessity of Tu-154M replacement emerged because of these reasons:

- technical and moral obsolence,
- economical demand factor (high fuel consumption, navigation, airport and landing fees),
- failure to satisfy noise and emmision limits (flights on exception - noise fees, flight ban on civilian airports from 22:00 till 06:00),
- inconvenient navigation, communication and technical equipment,
- insufficient flight performance (ferry capacity, maximum ferry range with respect to maximum service payload),
- lowered servicing and technical support availability.

## 2. MAIN DIFFERENCES BETWEEN AIRBUS A319CJ AND A319S OF CZECH AIRLINES' FLEET

Development of Airbus A 319 aircraft (Fig. 1) began on June 10, 1993 and the first's machine's roll-out took place at the production plant in Hamburg on August 24, 1995. It took off for its 3.5 hour long virgin flight the next day. Its next flight tests followed in Toulouse, France.



Fig. 1. The cockpit of Airbus A319CJ

Rys. 1. Kokpit Airbus A319CJ

The A319 aircraft acquired the ICAO and JAA certification for commercial operation on April 10, 1996 and it conducted its first passenger flight shortly after. Since the year 2000, an A319CJ version is manufactured, which is intended for private transport and mainly for government and VIP transport. For renewal of their fleet, the Czech Airlines are acquiring aircraft of the Airbus A320 type family, which includes the A318, A319, A320 and A321 models. One of purchased models will be the A319. After a thoughtful examination of airlift demands and the character of fulfilled tasks, the Czech Air Force chose the same type of aircraft.

In the case of the Czech Airlines, it is the standard A319 airliner with ferry capacity of 124 to 142 passengers, dedicated for short and medium range flights and purchased in the expected number of 12 aircraft. The annual production of airliners of this type is about 120 to 170 aircraft. In the case of the Czech Air Force, it is the special version of A319CJ (Corporate Jet) aircraft with ferry capacity of 44 to 100 passengers, intended for medium and long range flights. The annual production of this version is 8 to 15 aircraft.

It is obvious just from this general characteristic, that it is the same type, though with entirely different technical solution and with unlike technical parameters, equipment and quality of manufacturing. The main differences between A319CJ aircraft of the Czech Air Force (Fig. 2) compared with the Czech Airlines' link aircraft are in the power unit, which incorporates the CFM 56-5B/7P engines with higher nominal thrust of 15.5 kN, 4 700 km longer maximum range with additional fuel tanks (in the VIP version). Another differences are represented by the installation of the communication centre, cryptographic communication system, installation of intrusion protection system etc. From the operational point of view, the 92% system identity and 87% navigation and equipment identity of both versions of the aircraft is a major advantage.



Fig. 2. The Airbus A319CJ airplane in national colours

Rys. 2. Samolot Airbus A319CJ w państwowych (wojskowych) barwach

### 3. FUNDAMENTAL TECHNICAL SPECIFICATIONS OF THE NEW PURCHASED AIRPLANE

The last version of Airbus A319 so far is the A319CJ (Corporate Jetliner), sometimes designated as ACJ. The main change compared to the basic version is a high variability of the inner configuration of the passenger cabin. This version is currently manufactured in eight basic saloon modifications and the manufacturer offers nine more additional passenger cabin configurations for 10 to 43 persons. The CORPORATE saloon variant can be converted into ferry version for 100 passengers in approximately 10 to 12 hours.

Another important change regarding the A319CJ is the possibility of range enhancement up to 11 670 km. This is accomplished by installation of up to six additional fuel tanks with maximum capacity of 37 520 litres. The passenger cabin guarantees comfort especially during long intercontinental flights thanks to its equipment and size. The airplanes for Czech Air Force have a range of 8 300 km in the VIP version (with four additional fuel tanks – Fig. 3) and approx. 3 200 to 4 000 km in the TROOP version (without additional tanks or with two tanks).



Fig. 3. Installation of additional fuel tanks in the freight hold  
Rys. 3. Instalacja dodatkowych zbiorników paliwa w luku towarowym

The aircraft is standardly equipped with digital avionics of the third generation, which include fully automated flight-navigation complex FANS B, anticollision warning system TCAS, GPWS warning system, satellite navigation system etc. It can land under meteorological conditions of ICAO category II and III b practically at all common airports all over the world. The aircraft has the ETOPS certification for 180 minutes of flight with one functionless engine. It also incorporates fly-by-wire aircraft controls.

The aircraft is powered by two turbofan General Electric/Snecma CFM 56-5B7 engines with high bypass ratio and maximum thrust of 120 kN at take-off. It is also equipped with an auxiliary power unit (APU), which supplies the aircraft systems in the case of shutdown engines. Basic tactical and technical data of the A-319CJ are as following: maximum gross weight 75 500 kg, cruise speed 870 kph, cruise Mach 0.80, maximum FL 390.



Fig. 4. Wing mechanization of the A319CJ airplane

Rys. 4. Mechanizacja skrzydła samolotu A319CJ

Four deckchairs (among others) for patients will be purchased for the airplanes. These deckchairs are placed over the folding benches of the TROOP variant. Two PTU medical units are to be purchased for the second airplane. These can be installed in place of seats and will make it possible to transport heavily wounded personnel. The medical units are fully equipped with all necessary medical devices and an oxygen system. The PTU and deckchairs expand the applicability of A319CJ for MEDEVAC.

#### 4. CONCLUSION

By introduction of A319CJ into the transport component of Czech Air Force, an entirely new transport system is instituted. It is a new aircraft, which is by two generations more advanced than aircraft currently used. Higher demands lay on the flight personnel and also from the technical part point of view new problems will have to be solved regarding different system of maintenance, documentation, operation provision etc.

Major technical parameters of A319CJ airplane include maximum take-off weight of 75 500 kg, maximum landing weight of 62 500 kg, maximum weight without fuel of 58 500 kg, fuel capacity with four additional fuel tanks of 37 520 litres (which is 30 878 kg), cruising speed of 840 to 870 kph, range with 42 passengers of 8 300 km and ceiling of 12 500 m.

The essential advantages include the possibility of take-off and landing at all world airports, which come up to respective standards. Each airplane will have its independent communication centre, which provides fax, phone and internet satellite connection (SATCOM I). The airplanes are fully certified according to civilian regulations (JAA, FAA), they are certified for III.b category ICAO (ILS) operation, alpine airport (up to 14 100 ft) operations and they are further emission and noise certified according to ICAO Annex 16. The airplanes will be equipped with its own system of protection against unauthorized access during parking.

## References

1. Bejdák J., Janošek M.: *Letouny AIRBUS A-319CJ vojenského dopravního letectva Armády České republiky*. Mezinárodní konference „Letectvo 2006“, 4 až 5 května 2006, Brno, CD.
2. Cvrkal M.: *Airbusy rodiny A320 pro ČSA*. Letectví + kosmonautika. 2005, č. 3, s. 78–82,
3. Čadil J.: *Kbelské Airbusy*. Letectví + kosmonautika. 2007, č. 11, s. 26-29,
4. Janošek M.: *Present state of the Czech Air Force's transport component and fielding of the Airbus A-319CJ*. VII International Scientific Conference on New Development Trends in Aeronautics, 6<sup>th</sup> - 8<sup>th</sup> Septembre 2006, Košice, CD.

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