

AIRCRAFT FIREFIGHTING AND RESCUE EXPERIENCES

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Abstract:

The paper deals with the experiences gained from the firefighting and rescue operation executed on *Boeing 737-800* aircraft at the Belgrade Airport “Nikola Tesla”. It strives to describe the incident that occurred at the aircraft, as well as the executed rescue operation from the aircraft with 182 adults, 1 child and 6 crew members onboard. The paper further describes the reason for emergency landing and presents the applied firefighting and rescue tactics.

Key words: aircraft, accident, incident, firefighting, rescuing

FOREWORD

The best selling passenger aircraft of all times is “Boeing 737”. Since the beginning of the production in 1968, more than 600 aircraft of this narrow body passenger aircraft had been delivered world wide. The Boeing 737 Family consists of 10 aircraft types, five of which are still in production: 737-600, 737-700, 737-800, 737-900 and 737-900 ER. In their history, the “Boeing 737” aircraft had approximately 296 millions of operations (take-offs and landings) or in other words, one of them taking-off and landing each 4.6 seconds, while only this type had overflowed the distance 403 times bigger than the distance between Earth and Moon. [1] Such a big number of aircraft and thus big number of operations are indisputably the guarantee of the quality of this type of aircraft, and represent a great acknowledgement for “Boeing”, since their aircraft became a synonym for safety in air transport.

Unfortunately, aircraft accidents are reality in air transport. The most frequent reasons for aircraft accidents are thought to be provoked by human factor (pilots’ mistakes – 34% of all accidents), aircraft malfunctions – a gear failure (22 % of all accidents), engine failure (8% of all accidents), while all 17 different reasons are the cause for 36% of all aircraft incidents. [2]

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EMMERGENCY LANDING IN BELGRADE

One of the latest aircraft incidents in the Republic of Serbia occurred at the “Nikola Tesla” Airport, Belgrade on 18 October 2008. Aircraft type “Boeing 737-800” operated by German company „XL Airways“, registration marks D-AXLF, flight number GXL 674, flow on the route Frankfurt - Antalya.



Slide 1: „Boeing 737-800“

Main characteristics	
Length	39,5 m
Height	12,6 m
Wingspan	34,3 m
Seating Capacity	189
Max. take-off weight	70.535 kg
Empty weight	41.145 kg
Range	5.445 km
Maximum fuel	26.020 l
In production	Since 1997

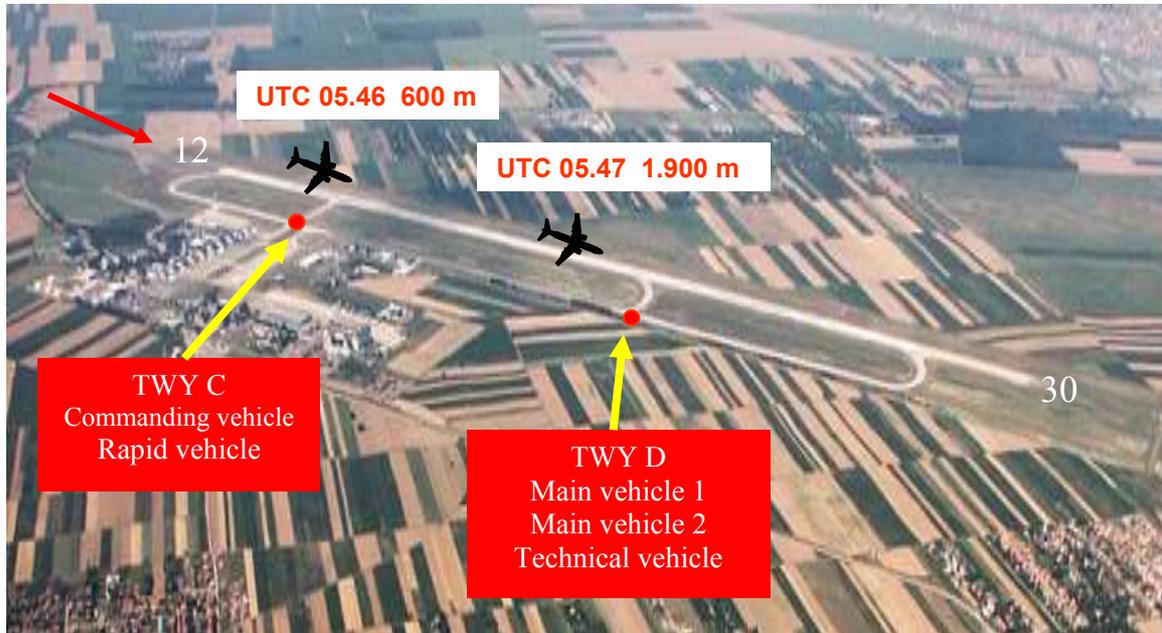
While entering the airspace of the Republic of Serbia, the pilot noticed a problem on the left engine, and though the signalization did not ensign the cause of the problem, he declared an emergency situation to the Aria Control Center in Belgrade, in accordance with the procedure for emergency situations. Aria Control Center instantly gave the priority to this aircraft and informed the Terminal Control Center at the airport “Nikola Tesla” about the need for emergency landing of the aircraft. There were 182 adult passengers, 1 child and 6 crew members onboard the aircraft and the aircraft had 7000 liters of fuel in its tanks.

At exactly 05:29 UTC (Coordinated Universal Time), the air traffic controller communicated by radio connection the first information about the necessity to engage the airport firefighting unit due to the technical problem with the left aircraft engine and since that moment the communication between the air traffic control and the firefighting unit was held on the radio channel provided for emergency situations at the airport. That very morning, the airport firefighting brigade consisted of 10 professional firefighters. On duty were the commander of the fire department, operator and 8 professional firefighters who at their disposal had three firefighting vehicles and one technical vehicle. The overall capacity of the firefighting vehicles was as follows:

Characteristics	Rapid Vehicle “PANTHER”	Main Vehicle 1 “SCAMEL”	Main Vehicle 2 “MAGIRUS”
Water, quantity (lit)	12.500	10.000	3.500
Foam quantity (lit)	1.500	1.000	500
Dry chemical powder, qty. (kg)	750	-	68
Range of water flinger (m)	80 (1) 70 (2)	75	70
Pump capacity (l/min)	6.500	6.000	4.500

That early morning at the Airport Belgrade weather was foggy and windless.

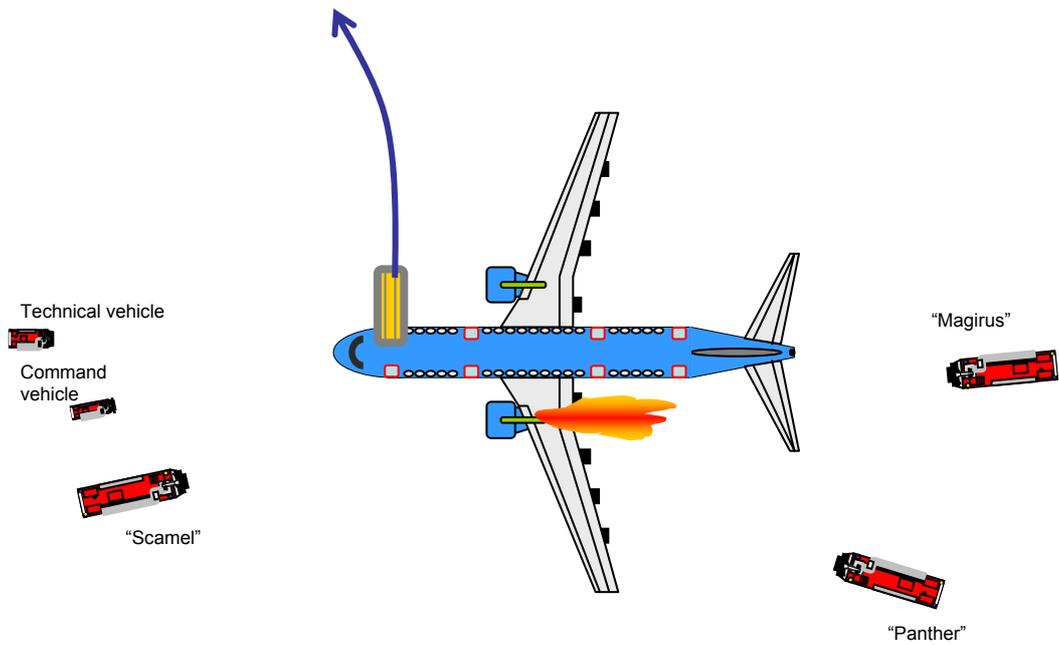
Acting in accordance with the Plan for Emergency Situations at the Airport Belgrade, firefighting vehicles were deployed at the intersection points C and D of the taxiway and the runway, in such a manner that rapid vehicle “Panther” and the commanding vehicle took positions at the intersection point C, which is 600 meters away from the Threshold 12, while main vehicle 1, main vehicle 2 and technical vehicle took positions at the intersection point D, which is 2000 meters away from the Threshold 12.



Slide 2: The position of the firefighting vehicles and the aircraft landing direction

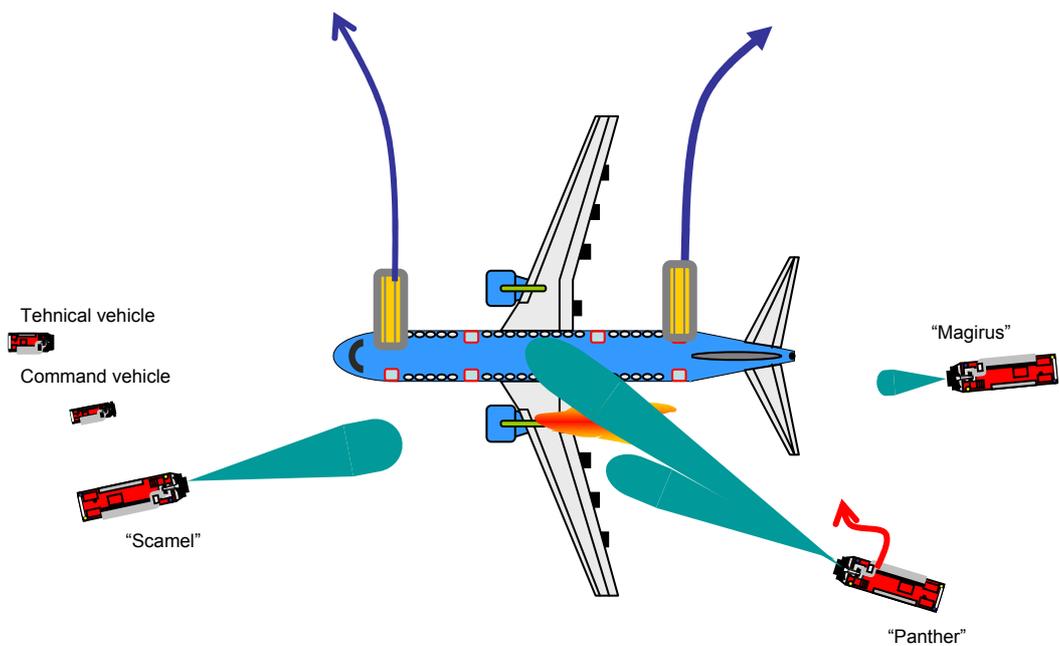
While the aircraft was still in the landing position, the air traffic controller noticed the fire on its left engine, of which he informed the firefighters by the radio connection. Exactly at 05:46 UTC the aircraft touched down approximately 600 meters away from the Threshold 12 and stopped about 100 meters away from the intersection point D, where were the Main vehicles 1 and 2 and the technical vehicle ready for action.

At the touch down point, the velocity of the aircraft was 250 km/h. The firefighting vehicles from the interception point D rushed after the aircraft that endeavored to stop as soon as possible by applying the brakes. As soon as the aircraft had stopped, the Main firefighting vehicles and the technical vehicle, positioned at the interception point D, started to move towards it. Main firefighting vehicle “Scamel” stopped at approximately 15 meters from the aircraft nose, while the other main vehicle stopped approximately 20 meters behind its tail. A few seconds after that, the rapid vehicle “Panther” reached the scene from the interception position C and took sideways position at approximately 20 meters from the aircraft tail. The commanding vehicle stopped in front of the nose, while the technical vehicle parked behind the commanding vehicle.



Slide 3: The position of firefighting vehicles just before the intervention

As soon as the aircraft had stopped, the cabin crew opened first the front door and then the back door on the right side of the aircraft, so the evacuation of the passengers by emergency evacuation slides commenced. The first spout of water was shot from the big water flinger of the "Panther" vehicle and directed towards the fuselage. The small water flinger operated into the center of the left engine which was on the fire, with the flame four meters long. All other firefighting vehicles shot the foam into center of the left engine. The fire on the engine was extinguished in 30 seconds, and evacuation of all passengers and crew members was completed in 40 seconds after the aircraft had stopped.



Slide 4: Engine firefighting

Upon distinguishing the fire, the operation of cooling by reel hose commenced, first from the firefighting vehicles “Magirus” and “Scamel” and then from the firefighting vehicle “Panther”. Firstly, they cooled the left aircraft engine and then the landing gear that was overheated due to abrupt breaking of the aircraft.



Slides 5 and 6: Cooling of the engine and the landing gear

The passengers and crew members were evacuated on the right side of the aircraft onto the grass area that separates the taxiway and the runway. During the evacuation process nobody was hurt, which surely is the credit of well trained cabin crew members, but also of the firefighting personnel that assisted the passengers in the evacuation from the aircraft. Support staff directed the passengers towards the airport area destined for evacuation and towards the taxiway, and when the busses and minivans had arrived, all passengers and crew members were transported to the terminal building where they were provided all necessary assistance.

CONCLUSION

The aircraft firefighting operation was performed in accordance with the ICAO standards and the stipulated firefighting tactics. In the firefighting action were engaged 10 professional firefighters, three firefighting vehicles, one commanding vehicle and one technical vehicle. In the rescue operation, in the capacity of the support staff of the firefighting brigade, were engaged eight airport workers who assisted during the evacuation process.

The air traffic control and all airport services (firefighting and rescue service, police, medical service, ground handling service) performed all their tasks very professionally, following the procedures stipulated in the Plan for emergency situations. During the evacuation process and fire fighting intervention nobody was hurt.

At the end, about 600 liters of foam (STAMEX 3% AFF) and 16500 liters of water were used to extinguish the fire, cool the engines and the landing gear.

REFERENCES

- [1] http://sh.wikipedia.org/wiki/Boeing_737
- [2] Martin Djovčoš „Danger at the Airport“, Studio Line, Belgrade, 2004