Ref. No 547/05/ZZ

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FINAL REPORT

Investigation separation minima infringement CSA 689 and DLH 2JC on 1 st of November 2005

Prague
December 2005

A) Introduction

Operator:	Czech Airlines J.S.C.
Aircraft type:	Boeing Aircraft Company, B735, registration mark OK-XGA, call sign CSA 1KL
	and
Operator:	Deutsche Lufthansa A.G
Aircraft type:	De Havilland INC, DH8D, registration mark D-ADHE, call sign DLH 2JC
Place of Incident:	at FIR EDDU, SW BEPAS
Date:	1 st of November 2005
Time:	14:23 UTC (All times in this report are UTC)

B) Synopsis

On 1st of November, 2005 ÚZPLN (Air Accident Investigation Institute of the Czech Republic, AAII) received from ANS ČR (Air Navigation Services) a report about an incident (separation minima infringement) involving a scheduled flight of Czech Airlines J.S.C., Boeing B735, call sign CSA 689 and Deutsche Lufthansa A.G., DH8D, aircraft call sign DLH 2JC in SW BEPAS airspace.

In accordance with the standards set in ICAO Annex / L 13, the Czech Republic was the State of Occurence and AAII carried out the investigation.

The cause of the incident was investigated by an AAII commission comprising:

Investigator in charge: Ing. Radomír Havíř, AAII Czech Republic

Member: Ing. Josef Procházka, AAII Czech Republic

The Final report was releised by:

ÚSTAV PRO ODBORNĚ TECHNICKÉ ZJIŠŤOVÁNÍ PŘÍČIN LETECKÝCH NEHOD
Beranových 130
199 01 PRAHA 99

On the 28th of December 2005.

C) The Final report includes the following main parts:

1) Factual information
2) Analysis
3) Conclusions
4) Safety recommendation
5) Annexes (to copy No.1 stored in UZPLN archive)

1 Factual information

1.1 History of the incident

On November 1, 2005 at 14:23 in the SW BEPAS airspace, the minimum separation between two aircraft occurred. The aircraft involved were Czech Airlines J.S.C., B 735, CSA 689 on a scheduled flight from LEBL (Barcelona) to LKPR (Praha Ruzyně) and Deutsche Lufthansa A.G. DH8D, DLH 2JC on a scheduled flight from EDDM (Munich, Germany) to EPPO (Poznaň Poland).

At 14:19:04 the CSA 689 crew flying at FL 320 received from ACC EDDM Munich controller the instruction to descent to FL 270, which the crew read back.

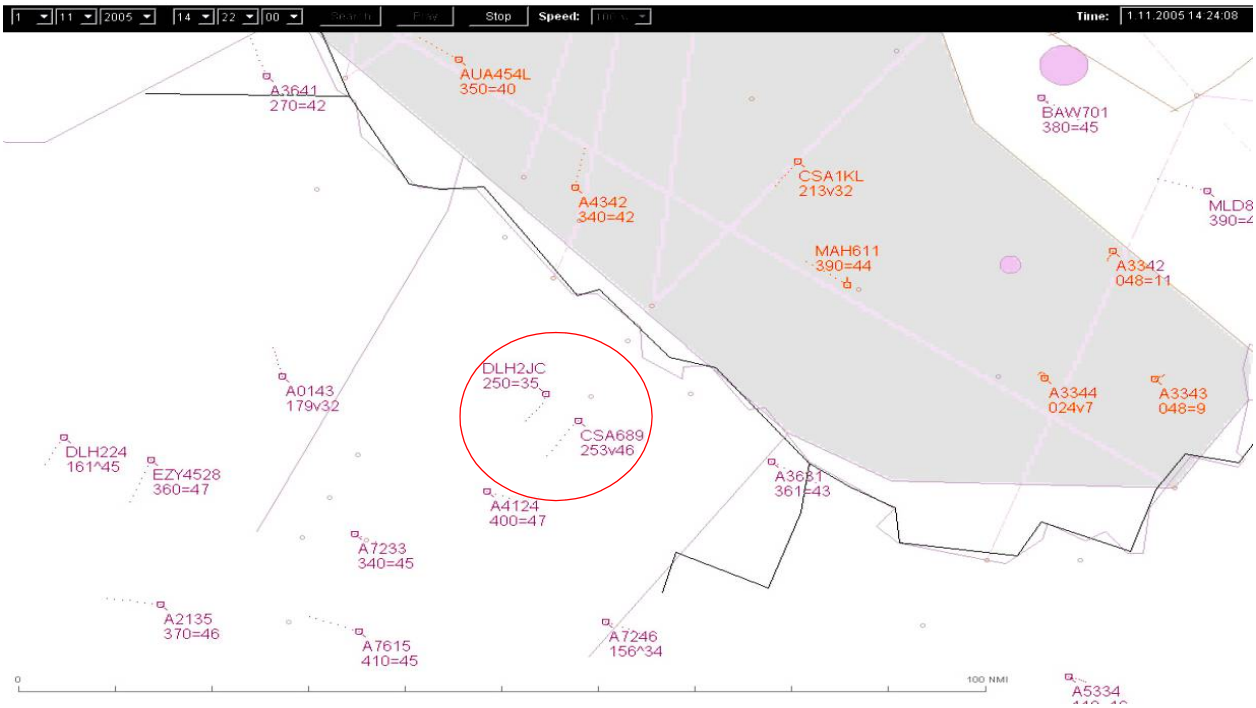
At 14:20:21 ACC EDDM issued CSA 689 with the instruction to continue direct to the point RASIM.

At 14:22:19 ACC EDDM issued instruction to CSA 689 to change frequency in to the Prague air traffic controller ACC EC Praha 120.27 MHz. The CSA 689 crew read back the instruction.

At 14:22:35 CSA 689 reported to ACC Praha on frequency 120.27 MHz to announce descent to FL 170 and heading for the RASIM point. The air traffic controller West Low sector (ACC WL EC Praha) acknowledged the CSA 689 report.

The CSA 689 crew, still in FIR EDOM, continued its descent (actual FL 260). Therefore at 14:23:09 ACC EDDM inquired of ACC Praha about CSA 689 further flight and at the same time passed on information on DLH 2JC plane in the vicinity of CSA 689 flying at the same heading at FL 250.

At 14:23:21 ACC WL EC Praha issued instruction to CSA 689 to stop descent at FL 260 and relayed information on significant traffic. CSA 689 read back the instruction and reported it was already at FL 256. So ACC WL EC issued instruction to change the heading by 20 degrees to the right. CSA 689 read back the instruction and reported that it followed the plane on TCAS. ACC WL Praha also issued an instruction to DLH 2JC to change the heading by 10 degrees to the left and informed DLH 2JC about the significant traffic at a distance of 4 NM (DLH 2JC was not yet in contact with ACC Praha).



At 14:23:56 ACC EDDM advised ACC Praha that DLH 2JC had significant traffic in sight. ACC Praha relayed ACC EDDM information that CSA 689 was reaching FL 250 and changing its heading 20 degrees to the right.

At 14:24:28 CSA 689 inquired of ACC WL EC whether to climb back FL 260. ACC WL EC Praha issued instruction to CSA 689 to keep FL 250 and asked CSA 689 to read back the instruction from ACC EDDM to descend. The CSA 689 crew announced that it received instruction from ACC EDDM to descend to FL 170. At the same time the DLH 2JC crew flying at a radar heading of 050 degrees established contact on ACC WL EC Praha frequency 120.27 MHz. The crew received instruction from ACC WL EC Praha to continue direct to the HOLAN point, which the DLH 2JC acknowledged. ACC WL EC Praha issued instruction to CSA 689 to continue to the RASIM point.

1.2 Injuries to persons

NIL

1.3 Aircraft damage

NIL

1.4 Other damage

NIL

1.5 Personnel information

1.5.1 The crew CSA 689

Job function	**CPT**			**F/O**		
Age	49			24		
Type qualification:	CPT B-737			FO B-737		
Type qualification /validity	B-737 till 30.6.2006			B -737 till 31.12.2006		
Duty:	28.10-31.10.2005			17 h.		
Practice	Last 24 h.	Last 90 days	Total	Last 24 h.	Last 90 days	Total
Total	2h 30 min	150 h	7.415 h	6 h	180 h	830
On type	2h 30 min	150 h	7.415 h	6 h	180 h	600
As CPT	2h 30 min	150 h	230 h			
As CPT on type	2h 30 min	150 h	230 h			
Medical validity till:	13.12. 2005			26.9.2006		
Qualification validity till :	22.6.2010			10.1.2010		
Last qualification training	22.7.2005			26.3.2005		

1.5.2 The crew DLH 2JC

NIL

1.5.3 Personnel information ATCO

Job function		ACC WL EC	ACC WL PC
Age		35	42
Day on duty		1	2
Duty duration (hours)	from beginning of workshift (including breaks)	7h 24 min	8h 24min
	From the latest duty rotation	1h 24 min	24 min
Practice (years)		1	14
Qualification good till		09.08.2007	23.03.2006
Latest qualification training		24.04.2005	28.03.2005

1.6 Information about aircraft

1.61. CSA 689

Aircraft type: Boeing
Model: 737/500
Registration: OK-XGA
Manufactuer: Boeing Aircraft Copany, USA
Year of namufacture: 1992
Seriál numer: 26539
Total flight hourse: 31 789 h 55 min
Landing number: 20 910
Last time-sharing work: 27.10.2005

The plane has a valid airworthiness certificate and liability insurance against third-party risks.

Airplane maintenance and pre-flight preparation had been carried out according to the procedures set by the manufacturer.

1.6.2. DLH 2JC

Aircraft type: De Havilland,
Model: DHC8D
Registration: D-ADHE
Manufactuer: De Havilland INC
Year of namufacture: NIL
Seriál numer: NIL
Total flight hourse: NIL
Landing number: NIL
Last time-sharing work: NIL

1.7 Meteorological information

According to The Czech Hydrometeorogical Institute of Air Weather Service (ČHMU) on 1st of November 2005 weather conditions at 14:30 over BEPAS point were as follows:

Wind: 310^{o} / 20 kts,
Visibility: CAVOK
Weather conditions: without operation-significant cloudiness, without precipitation

The clouds: FEW Sc 3000/3500,BKN LYR OVR 10000, Sc,St 1000-1500/3-3500
Turbulence: NIL
Icing: NIL

1.8 Radio navigation and visual aids

Radio navigation and visual aids had no effect on the incident.

1.9 Communications

Communications between the CSA 689 crew and the air operation services were on frequencies 129.550 MHz ACC EDDM and 120.27 MHz ACC WL EC Praha at the time of the incident. Communications were legible in either way.

1.10 Information about TMA II Prague

The incident occurred in FIR EDDM SW BEPAS area Class C.

1.11 Flight recorders and other recording means

The incident reconstruction was based on the radar record and communications with ACC Praha and ACC EDDM. The commission members did not have a CVR transcript, CSA 689 FDR or DLH 2JC recordings at their disposal.

1.12 Description of the place of incident

The incident occurred in the area ca 16 NM SW of the BEPAS reporting point, in FIR EDDM area at FL 250.

1.13 Medical and pathological information

NIL

1.14 Fire

NIL

1.15 Survival aspects

NIL

1.16 Tests and research

NIL

1.17 Organizational and management information

NIL

1.18 Additional information

The incident occurred in FIR EDDM beyond the area of STCA indication in ACC Praha. TCAS was activated neither on CSA 689 nor DLH 2JC. The analysis

concerned the activities of CSA 689 and DLH 2JC crews, procedures, radio communications and instructions of air operation services.

1.19 Useful or effective investigation techniques

The incident has been investigated in accordance with Annex 13.

2 Analysis

The analysis concerned the activities of CSA 689 and DLH 2JC crew´s, radio communications, radar recording and air operation service´s instructions.

2.1 The CSA 689 crew

The CSA 689 crew received from ACC EDDM the instruction to change its flight level from FL 320 to FL 270 with a vertical rate of 1,500 ft and more, and continue the flight direct to the RASIM point, which it confirmed. However, it commenced descending to FL 170. After change frequency in to ACC Praha the crew announced descent to FL 170, which was in contradiction with the clearance issued by ACC EDDM. ACC EC WL Praha confirmed this message with the phrase “radar contact”. On receiving the instruction to stop the descent at FL 260, the crew announced it was just descending to FL 256. Then it got the instruction to change its heading by 20 degrees to the right along with information on significant traffic. The crew ceased to descend at FL 250, changed its heading by 20 degrees to the right and reported monitoring the conflict traffic on TCAS. Then it followed instructions from ACC Praha to fly towards the RASIM point and farther to LKPR Airport.

2.2 The DLH 2JC crew

Following ACC EDDM instructions the crew flew at FL 250 to the point BEPAS. Subsequently it received the instruction to change the heading by 10 degrees to the left, which it confirmed. On change in to ACC Praha frequency, it continued flying onto the point HOLAN conforming to the instructions.

2.3 Air traffic control procedures

In accordance with coordination procedures, ACC EDDM issued the instruction to CSA 869 to descend from FL 320 to FL 270 at a vertical rate of 1,500 ft or more towards the RASIM point, which the crew confirmed. After change in to ACC Praha frequency, still in FIR EDDM, CSA 869 reported descent to FL 170, but ACC EC WL Praha ignored the report. In this airspace the flight handover is to take place at FL 270 conforming to the coordination agreement, however the actual FL was 274 at the time of establishing contact. That might have made ACC WL EC sure that the flight went on routinely, which could in turn have weakened the attention of receiving radio communication with CSA 869.

When ATCO ACC EDDM found out that CSA 869 was passing FL 264, they asked ACC Praha whether CSA 869 was cleared to a further descent and warned of traffic at FL 250 (DLH 2JC). In addition, ATCO ACC EDDM passed on information that this traffic had been tuned in to ACC Praha. After checking the situation, ACC EC WL Praha gave CSA 869 the instruction to stop descent at FL 260. Taking into

account the information from CSA 869 that it was passing through FL 256 (lower vertical separation), ACC EC WL Praha issued instruction to change the heading by 20 degrees to the right to ensure the maximum horizontal distance and passed on information about significant traffic. CSA 869 ceased descending at FL 250, changed its heading by 20 degrees to the right and reported monitoring of the conflict traffic on TCAS. The crew continued its flight onto the RASIM point and farther to LKPR Airport following instructions from ACC Praha.

3 Conclusions

The commission made the following conclusions:

3.1 The CSA 689 crew

- The crew was fully qualified and airworthy;
- received the instruction from ACC EDDM to change its flight level from FL 320 to FL 270, which it confirmed;
- commenced to descend to FL 170, which was inconsistent with the confirmed instruction (FL 270);
- after establishing contact with ACC Praha, it reported descent to FL 170;
- conforming to the instruction from ACC Praha, it changed the heading by 20 degrees to the right;
- following instruction from ACC Praha, it stopped descending at FL 250;
- monitored conflict traffic on TCAS;
- continued flight toward the RASIM point and farther to LKPR airport.

3.2 The DLH 2JC crew

- maintained FL 250;
- following the instruction from ACC EDDM, it changed the heading by 10 degrees to the left;
- monitored conflict traffic on TCAS;
- after establishing contact with ACC Praha, it continued flight towards the HOLAN point, following the instructions.

3.3 Air traffic control procedures

- Both EC and PC ACC WL were fully qualified and capable to do the job;
- conforming to coordination procedures, ACC EDDM gave CSA 689 the instruction to descend from FL 320 to FL 270 at a vertical rate of 1,500 ft;
- ACC WL Praha did not notice that the CSA 689 crew announced descent to FL 170;
- after receiving information from ACC EDDM about CSA 689 further descent to pass the cleared FL 270, ACC WL Praha issued the instruction to stop descending at FL 260 to secure the minimum vertical separation (1,000 ft) from DLH 2JC;

- since the CSA 689 crew announced passing through FL 256, ACC WL Praha gave instruction to change the heading by 20 degrees to the right to secure the maximum horizontal distance;
- ACC EDDM issued the instruction to change the DLH 2JC heading by 10 degrees to the left to secure the maximum horizontal distance;
- ACC EDDM relayed DLH 2JC information about significant traffic;
- ACC EC WL Praha passed on information about significant traffic to CSA 689.

3.4 Causes

Direct causes of the incident, - reducing the separation minima infringement between CSA 689 and DLH 2JC, were the following:

- CSA 689 crew did not keep to the flight clearance issued by ACC EDDM
- ACC EC WL Praha crosstalk;
-

At the time of the incident, the vertical separation was 500 ft, which is 50 % of the determined minimum separation, and horizontal separation was 4.31 NM, which is 86.11 % of the determined minimum separation. Since the safety of the aircraft in question were not put on risk (the planes were on parallel airways), the occurrence is classified as a "**Significant incident**" according to ESSAR 2 or as an **INCIDENT** according to L13 Regulation.

4 Safety recommendation

Corrective measures are up to decisions by the operator Czech Airlines J.S.C. and ANS ČR.

Prague, 28th of December 2005.