

of the Czech Republic

Ref. No 16/06/ZZ

FINAL REPORT

**Investigation of Incident A/C Boeing B737- 400, Registration Mark OK-YGU,
during the flight on 25th January 2006**

Prague
September 2006

A) Introduction

Operator: CSA a.s., Czech Republic
Aircraft manufacturer and model: Boeing B737-400, Q8
Place: Prague/Ruzyně (LKPR)
Date and time: 25/01/2006, 19:55-21:21 (All times are UTC)

B) Synopsis

On 25 Jan. 2006 AAI (Czech Republic Air Accident Investigation Institute) was notified by the airplane operator of a serious incident involving a flight CSA633 from Brussels to Prague. During the flight the captain decided to use a crew oxygen mask because there were cosmetic smell indications in the cockpit. There was no smell indication in the passenger cabin. The flight terminated safely at the aerodrome of destination with no injuries to passengers or damage to the aircraft.

The final report on the incident issued AAI based :
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The cause of the incident was investigated by an Air Accident Investigation Institute commission comprising:

Commission chairman: Mr. Ing Lubomír Střihavka
Commission member: Mr. Ing. Josef Procházka
Mr. Ladislav Musil

C) The report includes the following main parts:

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

1 Factual information

1.1 History of the flight

Flight history description is related to the operation of OK-YGU airplane and its crew activities on 25 Jan. 2006.

1.1.1 OK-YGU Airplane Operation

On 25 January 2006 following a night stay in Dublin the plane arrived at LKPR where it landed at 10:02. Subsequently the plane was designed for flights OK834 and OK835 from Prague to Beograd and back. The plane came back to Prague at 14:49. All these flights were executed with different crews. Neither the crews nor passengers reported or noticed any abnormal performance of the plane and its systems during the flight. No crew member or passenger noticed any smells whatsoever.

1.1.2 Crew Scheduling

On that day the crew in question had flown B 737, registry OK-DGL, from Prague to Rome and back, taking off in Prague at 11:01 and arriving in Rome at 12:23. The Rome takeoff and the Prague arrival were at 13:42 and 15:25 respectively. Then the crew flew OK-YGU on flights OK632 and OK633.

1.1.3 Flight OK632 Prague - Brussels

The flight started at 17:21. The CPT noticed smell indications when the plane was half way through from Prague to Brussels, approximately over Frankfurt upon Mohan. The CPT qualified the smell indications as a cosmetic smell of the liquid used in the airplane's toilet system. The CPT asked the FO if he smelled the same odour, which the latter confirmed. The FO said the smell was low intensity on his side. The CPT was the flying pilot to Brussels. Both of the pilots examined the cockpit to know whether it might be smoke or fume. Then CPT in collaboration with CC had the passenger cabin, the two toilets, washbasins with the room under them checked, but no anomalies were found. Since no smoke or fume was found, CPT came to the conclusion that the flight safety was not jeopardized and continued to fly to Brussels without restriction. After landing CPT informed the operator's troubleshooting division in Prague and was told to have the plane checked by technicians at Brussels airport. A technician who made the check there smelled a strange smell too. However the technician found no fault and thought the trouble might be caused by frozen water in the front toilet system due to severe frost on the ground. The technician recommended emptying the front toilet and not using it in the next flight. At time of checking, the tank was already full, so it was emptied and the toilet was locked up during the back flight. MEL 38-2 was applied at the next OK-YGU flights (front toilet was not used).

1.1.4 Flight OK633 Brussels – Prague

The flight started at 19:55. During the flight the captain repeatedly experienced a bad smell, which was the same as in the previous flight but more intensive. FO was the flying pilot at that time. CPT reported in his statement that the cosmetic smell had been so much intensive that his eyes smarted and he had a subjectively unpleasant feeling. CPT asked FO if he smelt the bad smell as well. FO answered yes but said the smell did not hamper him to steer the plane. CPT decided to put on the cockpit oxygen mask and set oxygen output at 100%. Then he checked the communication device with FO. CPT said that the unpleasant feeling had passed away after a few minutes and his eyes stopped hurting. After around 10 minutes from putting on the mask and after he checked on FO if the smell still existed, CPT put off the mask as the smell intensity was slow. The flight was finished at 21:21 without interruption. The flight finished, a technician was called out. He confirmed the presence of the cosmetic smell and said it was like a strong scent. Then a technical check was made on the airplane the results of which are in Part 1.6.

1.2 Injuries to persons

Injuries	Crew	Passengers	Others (inhabitants, etc)
Fatal	0	0	0
Serious	0	0	0
Light/no injury	0/6	0/96	0

1.3. Damage to Aircraft

The aircraft was not damaged in the incident. All systems worked well.

1.4 Other damage

NIL

1.5 Personnel information

CPT

Aged 29 years, ATPL licence valid till 20 April 2010, rating CP B 737, medical valid till 16 May 2006

Flying experience	Flight time in last 24 hrs	Flight time in last 10 hrs	Total
Total	6:19	190:56	399:35
With B737 type	6:19	187:41	307:46
As PIC	6:19	188:01	1393:17
As PIC on B737	6:19	187:41	556:25

Time off duty prior to the flight: 21 Jan – 24 Jan 2006

CPT passed the latest exam "Operator Proficiency Check on 13 Oct 2005

FO

Aged 29 years, CPL licence valid till 31 March 2009, rating FO B 737, medical valid till 8 Nov 2006.

Flying experience	Flight time in last 24 hrs	Flight time in last 10 hrs	Total
With B737 type	7:35	179:43	1431:16

Time off duty prior to the flight: 21 Jan – 22 Jan 2006

FO passed the latest exam "Operator Proficiency Check on 15 Jan 2006.

1.6 Aircraft information

Boeing, Type B737-400, variant Q8, serial number 26289, year of manufacture 1993, registration mark OK-YGU.

At time of incident the airplane had accumulated a total of 31,524.56 hours (FH)/20,132 flight cycles (FC).

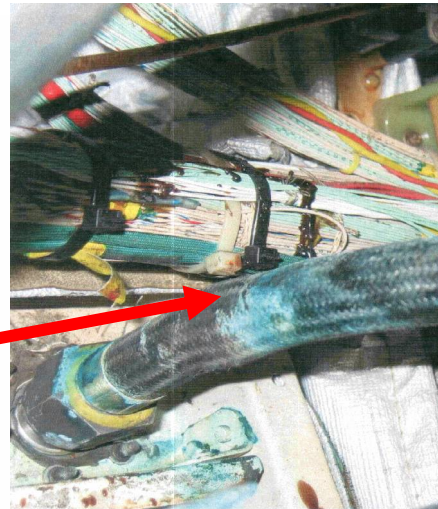
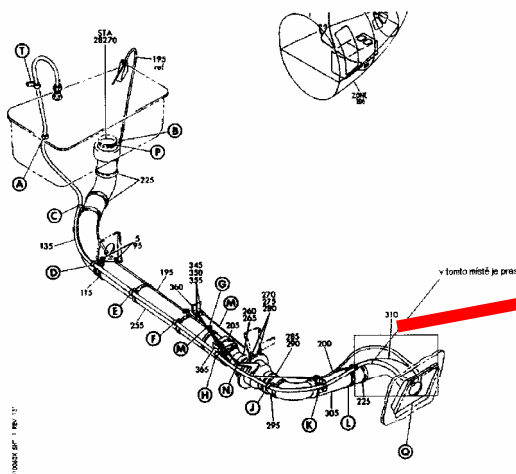
Latest maintenance in the range of "S-CHECK was on 21 Jan 2006 at 31,496.20 FH/20,117 FC.

Latest maintenance in the range of "Daily Check was on 25 Jan 2006 at 12:00.

Check results:

After arrival in Prague, checks revealed surface leak in the front toilet filling hose P/N 41-201-355 around 50 mm away from the filling hole screwing. Liquid leak from the hose contaminated the sound-thermal insulation of the inside front space under the front toilet. The contamination had a form of blue crystals and sediments of dried liquid. This state had probably lasted for a longer time and might have contaminated air in this space.

Zjištěna prasklá hadice plnění kapaliny do předního WC-pozice 135.



Pic No.1 Filling hose leak on front toilet tank

Air was taken from the contaminated space and blown by recirculation fans to the pipes of EFIS boxes in cockpit equipment cooling. When C-check was made on 8 March 2006, the front toilet was dismantled to find potential leakage. Using a K-37-38-4402 card a detailed check on the cockpit was also made for foreign particles that could have caused the smell. Both of the checks revealed nothing that might have been linked with the cabin smell.

1.7 Meteorological information

Conditions: CAVOK, wind 240 degrees/4 – 5 m/sec

Light conditions: night

In January, winter chilly weather prevailed in most destinations of OK-YGU flights, with temperatures falling below -5°C and lower.

1.8 Aids to navigation

Navigational aids worked flawlessly in cockpit and at LKPR too. Radio-navigation and visual means had no effect on the incident.

1.9 Communications

ATS were provided from LKPR. A frequency of 119,0 MHz, Ruzyně Radar (APP), 118.1 MHz, Ruzyně Tower (TWR) and 121,9 MHz Ruzyně Ground was used for communication.

1.10 Aerodrome information

The plane landed on LKPR international airport. RWY 24 was operational on the day of incident.

1.11 Flight recorders

The airplane was fitted with an operation data recorder of the QAR, P/N 216-100-1007321 type. The recorder was examined by the operator after landing. The recording was legible and showed fault-free operation of the aircraft systems.

1.12 Description of incident site

NIL

1.13 Medical and pathological information

CPT experienced indications of cosmetic smell in the cockpit during two flights. It follows from what other crewmembers and the ground staff say that they also felt the smell in the cockpit. According to CPT's statement, the cosmetic smell made his eyes pain, causing stomach trouble and further non-specified problems too. The symptoms partly passed as CPT get off the plane when the flight was over. After the night's rest he recovered completely, so feeling well again, he did not go to the doctor and continued his duty the following day.

1.14 Fire

NIL

1.15 Survival aspects

NIL

1.16 Tests and research

NIL

1.17 Organizational and management information

Handling agency procedures in filling up the front toilet tank:

The front toilet tank is filled through a pressure facility used by airport HA at the flight preparation. There are various pressure facilities, none of them being the subject of the incident investigation. The airplane operator accepted however different HA procedures for filling the front toilet tank at the airport where his planes take off. The Prague airport differs from some others in that the tank is rinsed first and then filled with clean water. Then a bag with disinfecting agent is put in. In our case the disinfectant CB Honey Bee 44, a unit pack of 15 g was used. This procedure was applied to flight OK632. At the Brussels airport for the flight OK633 (Brussels – Prague), the toilet was tanked with a water solution that already contained a

disinfectant 3466 Novirasic Gel. Both of the disinfecting solutions are approved for use in civil aviation.

1.18 Additional information

The flight OK632 carried some dangerous material in the back cargo section – radioactive material (RRY) UN number 3332. The flight OK 633 carried some dangerous material in the back cargo section – radioactive material (RRY) UN number 2915. Both the cargos conformed to special transport conditions under the “Special Load Notification”. The goods transported had no connection with the incident.

1.19 Useful or effective investigation techniques

The incident has been investigated according to L 13 National Regulation (Investigation into Air Accidents and Incidents).

2 Analysis

2.1 Factual Information Analysis

- the crew was qualified and trained for the flight and had medical certification;
- the airplane had valid airworthiness certification;
- the airplane was released for operation after check in Brussels. MEL 38-2 was applied preventively, but that did not prevent the incident from occurring as there was a hidden defect on the plane – leak in the front toilet filling hose;
- it was not possible to detect the hose leak without dismantling access panels to the pressurized front fuselage;
- closing down the toilet had no direct influence on contamination of room designed for taking out air to cool EFIS;
- after the incident the captain did not undergo a medical examination since this procedure is not stipulated in the legal contract of work between the employee and the air operator;

2.2 Using Oxygen Mask

It was up to the captain whether or not to use the oxygen mask, conforming to “Non-Normal Procedures”. In case it is not possible to fix all events that might come up in flight, it is the captain with his skill and experience who is to decide what to do in „Non-Normal Procedures“.

“When the smell intensity began to hamper the captain’s ability to pilot safely, his decision to use the mask was correct” said a doctor of ÚLZ Prague (Aviation Health Organization). From the medical point of view, the individual sensitivity to aromatic stuff can only be guessed (if one perceives the smell or not). Doctors say the individual sensitivity to aromatic stuff is subjective nature and that is why only one crewmember used the mask.

2.3 Influence of Meteorological Situation

Regarding the meteorological conditions at time of toilet filling and the fact the

tanks are filled with pure water or disinfectant water solution, some liquid in the hose could have frozen due to frost after the filling liquid was disconnected. The front toilet filling adapter is not heated, so the liquid could have frozen in the filling screwing. The untightness was detected 50 mm from the filling screwing.

3 Conclusions

The primary cause of the incident was the contaminated room from which air is taken for EFIS cooling and contamination penetration into the cockpit. The contamination was caused by the leaking filling hose of the aircraft's front toilet tank. The leaking disinfection solution penetrated the insulation panels and the intensity of panel contamination depended upon the way the tank had been filled up. At the home airport, the tank was filled with pure water, so the air contamination level in the front section was low, not causing trouble to the crew. Where the tank had been filled with a disinfection solution, contamination was higher and might have had an adverse effect on more sensitive persons. Crewmembers' reaction to smell is strictly individual, depending on how one perceives aromatic stuff. The moment the leak began could not be determined exactly, it might have been a few days to one week. Considering the witnesses' statements and technical findings, the investigation commission has re-qualified the event from the serious incident to an incident for technical reasons.

4 Safety recommendations

Safety Recommendations for Operator

- The operator will inform B737 FC and CC squadrons and technicians of this final report in full;
- The operator will inform his and contractual handling agencies of this report in full;
- The operator will take other measures of his own to enhance technical maintenance of aircraft.

6th September 2006