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FINAL REPORT

**Investigation into the incident
of aircraft B 777-2Q8ER,
at LKPR on 18 April 2006**

Prague
October 2006

A) Introduction

Operator:

Viet Nam Airlines

Aircraft type: Boeing, B 777-2Q8ER
Registration: VN-A149
Place of Incident: FIR Prague (LKAA)
Date and Time: 18. 4. 2006, 03:32 (All times in this report are UTC)

B) Synopsis

On 18 April 2006 the Czech Republic ATC notified Czech Republic Air Accident Investigation Institute (AII) of an incident involving a Boeing 777 of Viet Nam Airlines. The air crew on HVN 545 flight from Hanoi Noi-Ba (VVNB) airport to Frankfurt (EDDF) airport entered FIR Prague over the PADKA at FL 360 without establishing contact and continued to the RAPET. The ACC Prague controller made all the prescribed attempts to establish contact with HVN 545 crew. JAS 39 Gripen fighters of the Czech Air Force (QRA) scrambled to intercept the airplane upon which contact with the crew was established on the emergency frequency. The crew got the instruction to transfer to the appropriate sector frequency and continued on the scheduled route.

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

Investigator in charge: Ing Stanislav Suchý
Members: Ing. Radomil Havíř
Ing. Ludmila Pavlíková - MOD

Based upon the investigation findings, a request was sent on 18 April 2006 to the Viet Nam Airlines Office in the Czech Republic and the Civil Aviation Administration – Viet Nam to provide information about the event. UZPLN received the information requested in writing on 30 May 2006.

The Final report was released by:

AIR ACCIDENTS INVESTIGATION INSTITUTE
Beranových 130
199 01 PRAHA 99

On the 3 October 2006.

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 AII archive)

1 Factual information

1.1 History of the incident

On 17 April 2006 the B 777-2G8 crew of Viet Nam Airlines, call sign HVN 545 was on flight HVN 54 from Hanoi Noi-Bai (VVNB) airport to Frankfurt airport (EDDF). The flight proceeded in FIR PRAHA (LKAA) from PADKA on route UL 984 via DONAD on route UT 170 to RAPET. At 03:25 the ACC Warsaw radar controller informed the ACC Prague radar controller (ACC EC) that they had had no contact with HVN 545 for all the time the plane was in FIR Warsaw (EPWW). The HVN 545 plane flew in EPWW on route DIBEB – PADKA without deviations from FLP. The Polish Air Force, which only monitored the HVN 545 flight, was also informed of the situation.

At 03:31 when the HVN 545 with squawk code SSR 1703 switched on was 90 km east of PADKA, an officer of the Control and Reporting Center (CRC) asked about contact with HVN 545 of the radar controller of military area control center (MACC EC), who requested information from ACC EC. ACC EC told him that he himself as well as crews of other planes had made many attempts to establish contact on emergency frequency 121.5 MHz.

At 03:36 HVN 545 entered LKAA at FL 360 with no contact established over PADKA and continued to fly according FLP. At 03:37:40 MACC EC asked ACC EC again, whether contact was established with HVN 545, and announced that QRA would scramble to solve the situation and in this connection he took over complete control to FL 380.

The flight HVN 545 did not answer calls on emergency frequency so QRA pilots started intercepting at 03:50 trying to establish two-way communications on emergency frequency. At 03:56:19 the HVN 545 crew 15 km east of Prague reacted to the close presence of QRAs and reported themselves on the emergency frequency. The QRA pilot instructed the HVN 545 to establish contact with “Praha Control”. The HVN 545 crew requested a contact frequency. The military radar controller gave the QRA pilots a frequency of 132.07 MHz and the QRA pilot then passed this frequency to the HVN 545 crew. ACC EC in reaction to this told MACC EC that the HVN 545 had received from the QRA pilot instruction to contact a wrong frequency and stated the correct sector frequency.

At 03:58 ACC EC established two-way communications with HVN 545 on the emergency frequency and gave its crew the instruction to contact to the sector frequency. At 03:58:44 HVN 545 established contact with ACC EC on the sector frequency and announced there were fighter aircraft around. ACC informed the HVN crew that the interception had been provoked by their flight with no contact established.

At 03:59 ACC EC informed MACC EC that two-way communications had been established and requested that the scramble should finish and QRA fly away because there were other traffic around and HVN 545 should change its flight level before leaving LKAA. HVN 545's flight was then coordinated by ACC EC and FIR RHEIN.

At 04:01:42 ACC EC gave MACC EC another notice to ensure QRA break away manoeuvre. MACC EC said the break away manoeuvre would be performed to the right with a descent to FL 180. At 04:02:45 ACC EC told the HVN crew that QRA fighters would perform the break away manoeuvre to the right and to maintain the original heading.

At 04:03:30 the QRA pilots began the break away manoeuvre to the left where there was other traffic at FL 300. At the same time ACC EC tried for 9 minutes in vain to call by phone MACC EC to coordinate the way of QRA break away manoeuvre and QRA next flight. As late as 04:10:27 when QRA pilots descended to FL 180, MACC EC phoned ACC EC to employ TRA 65 to use up QRA fuel.

At 04:03:41 ACC EC instructed HVN 545 to continue to RAPET, descend to FL 320 and make contact with ACC RHEIN. At 04:07 HVN 545 left LKAA. After making the situation clear, the QRA pilots continued to TRA 65. After QRA using up the fuel and returning to the airport, MACC EC responded to ACC EC's advice and brought the TRA 65 activation to an end at 04:45.

The pilot in command stated in the PLOC report that he had made contact on frequency 132.775 MHz, received information about radar contact and then along with his co-pilot kept monitoring this frequency trying to establish further contact. The PIC was on reception using the loud speaker, the co-pilot was using the head-set with earphones. The crew also said that they had simultaneously monitored the emergency frequency 121.5 MHz on the second radio station.

1.2 Injuries to persons

NIL

1.3 Damage to aircraft

NIL

1.4 Other damage

NIL

1.5 Personnel information

The PIC, aged 46, holder of ATPL(A), had a PIC qualification for the type B 777. He has flown on the type B 777 total 1640 hours.

The F/O, aged 33, holder of ATPL(A). He has flown on the type B 777 total 1042 hours.

1.6 Aircraft information

Type and Model:	Boeing, B 777-2Q8ER
Registration:	VN-A149
Manufacturer:	Boeing
Serial number:	518

1.7 Meteorological information

Meteorological conditions had no effect on the flight. The flight was executed under VMC according to the PIC. The QRA interception took place at the sun rise (SR 03:58).

1.5 Aids to navigation

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

1.6 Communications

There were no two-way communications between the HVN 545 crew and EPWW and LKAA air traffic services until 03:58. At that time contact was established on the emergency frequency 121.5 MHz and at 03:58:44 on the sector frequency 132.89 of ACC EC. A direct telephone link is in operation between ACC and MACC and between MACC and CRC.

1.10 Aerodrome information

NIL

1.11 Flight recorders

Pertinent data from flight recorders were not available to AAll investigation. The ATS records were used for an analysis.

1.12 Description of incident site

NIL

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

Civil Aviation Administration of Viet Nam has sent a completed report "Prolonged Loss of Communication (PLOC)". ATS of Poland provided information about the HVN 545 flight without the two-way communication established in FIR EPWW and information from ATS of Ukraine.

1.19 Useful or effective investigation techniques

The serious incident has been investigated in accordance with Annex 13. Factual information relevant to history of flight provided to AAll the Civil Aviation Administration – Viet Nam.

2 Analysis

2.1 When flying in EPWW the HVN 545 crew had no contact with the competent air traffic controller who repeatedly tried to establish contact on frequency ACC 134.92 MHz and on the emergency frequency 121.5 MHz. According to information he got from ATS Ukraine, the crew had maintained no two-way communications with respective ATC stations since the flight in FIR KIEV.

2.2 It could not be found out which air station had assigned the 132.775 MHz frequency of the FIR KIEV sector to the HVN crew, informed about radar contact, and whether it advised the crew of a new sector frequency the HVN 545 was heading for.

2.3 Starting at 03:33:56, AAC EC called the HVN 454 crew six times on the emergency frequency 121.5 MHz. Also the crew of another airplane of Viet Nam Airlines, flight HVN 333, attempted to call HVN 545. But HVN 545 did not answer any calls on the emergency frequency so the permanent listening to the emergency frequency, as the HVN 545 pilot claims, is not likely. According to Civil Aviation Administration – Viet Nam the loss of two-way communication with HVN 545 was not for technical reasons.

2.4 The QRA intercepting was in a standard way. During the intercepting the QRA pilot called the HVN 545 three times on the emergency frequency 121.5 MHz. The HVN 545 crew reacted to the intercepting QRA planes and contact with the crew was not established on the emergency frequency of 121.5 MHz until 03:56:19, i.e. after 25 minutes' contactless flight in LKAA.

2.5 The military radar controller read the frequency on the display of a device for remote controlled radio stations Distanc at the channel selector on which he monitored radio connection at the ACC Prague sector frequency. He did not check out the correct frequency and passed it to the QRA pilots. The value of ACC Prague frequency as displayed on the Distanc device was wrong, which was caused by the fact that military radio stations are operated with a channel separation of 25 kHz.

2.6 From 04:01 to 04:10 the connection between MACC and CRC and between MACC and ACC Prague did not work for technical reasons. The radar controller of military use, who could not coordinate making a new decision, did not proceed in compliance with the way the break away manoeuvre had been coordinated, i.e. to the right. With regard to the scrambling QRA planes, which were to the left of HVN 545, he gave them an order to break away to the left without crossing the HVN 545 course.

3 Conclusions

3.1 The commission has come to the following conclusions:

- The HVN 545 crew was qualified and rated for the flight;

- The airplane had valid airworthiness certificate, maintenance certificate, and operation approval certificate;
- The HVN 545 crew did not establish in a common way direct duplex transmission with ATC units, appropriate EPWW and LKAA in which they flew;
- The ATC units' attempts to establish contact with the HVN 545 crew on the emergency frequency were useless till 03:56:19. N 545 did not respond to messages sent on the emergency frequency and identifying HVN 545 unambiguously;
- The link between ACC Prague and MACC and respective military stations was broken. The link had been built to enable exchange of information important to safe and effective traffic control.crew was type-rated.

3.2 The causes

The incident was caused by the failure to establish two-way communication on the frequencies approved by procedures applied to transmission among ATC stations in the airspace in question.

3.3 The following failures in the work of military stations occurred in the course of interception:

- Link between ACC Prague and MACC as well as between MACC and CRC did not work at the time the QRA planes were finishing intercepting;
- The break away manoeuvre was not executed according to the coordinated procedure.

4 Safety recommendations

The aircraft operator should ensure procedures making air crews more attentive when crossing FIR borders and establishing two-way radio communication with ATC units.

Prague, October 2006