

**Ref. No 451/04/ZZ**

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# **FINAL REPORT**

**Investigation into Runway Incursion by  
NAF 142  
at LKPR on 5<sup>th</sup> of October 2004**

Prague  
June 2005

**A) Introduction**

Operator: North Flying, Denmark  
Aircraft type: Fairchild Aircraft corporation USA, SW4  
Place of Incident: Praha – Ruzyně Airport (LKPR), RWY 24/13  
Date: 5<sup>th</sup> of October 2004  
Time: 19:20 UTC (All times in this report are UTC)

## **B) Synopsis**

On 6 October 2004 UZPLN (Air Accident Investigation Institute of the Czech Republic) received a report from ATC CR on a serious incident of an SW4 aircraft of North Flying Airline Company NFA 142. The plane taxied down RWY 24 to the holding point near RWY13 and made incursion into the runway RWY 13 in use crossing it at the place where RWY 13 and RWY 24 intersect. At that time another plane, F 27 Blue Strip – Farnair Hungary FAH 6903 was making a landing on RWY 13, which at the time of RWY 13 incursion was at a distance of 1 km from THR RWY 13. The report received, investigation into the incident got started.

On 3 November 2004 UZPLN reported the event to responsible authorities of Denmark, Hungary and ICAO and asked for relevant information in accordance with Annex 13. According to ICAO Annex 13 standards the Czech Republic was the country of the incident and AAI looked into the incident causes.

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

Investigator in charge: Ing. Radomil Havíř  
Member: Ing. Stanislav Suchý

The Final report was released by:

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

On the 15<sup>th</sup> of June 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 5 October 2004 the SW4 executed a charter flight NFA 142 from Praha/Ruzyně Airport (LKPR) to Coventry Airport (EGBE). RWY 24 at LKPR was closed because of planned repair work. A part of RWY 24 between TWY A and cross with RWY 13 was only used for taxiing.

At 19:11:46 NFA 142 got an instruction from taxi controller (GEC) on frequency 121.9MHz to taxi down TWY P and hold short of TWY L.

At 19:14:41 being asked if the takeoff from RWY 13/ TWY F cross was OK, NFA 142 answered that it needed all the length of RWY 13. Therefore it was given the instruction to taxi down TWY L, C, RWY 24 and “hold short of RWY 13”. The crew acknowledged the taxi clearance.

At 19:17:06 NFA 42 got from GEC an instruction to taxi down TWY C and enter RWY 24.

At 19:18:24 NFA 24 got from GEC the instruction to retune in to frequency of airport control Ruzyně Tower (TEC) 118.1 MHz.

At 19:18:46 NFA 142 established contact with TEC and announced taxi to the vicinity of RWY 13. From TEC it received and acknowledged the instruction to “hold short of RWY 13”.

At 19:19:14 TEC gave a landing clearance to the FAH 6903 airplane, which was 2.6 km from THR RWY 13. NFA 142 was some 500 m off RWY 13. Both of the planes, FAH 6903 and NFA 142 were on the same TEC frequency.

At 19:19:40 the taxiing NFA 142 was around 50 m from the edge of RWY 13 and the landing FAH 6903 was 1.27 km to THR RWY 13. NFA 142 did not stop in the vicinity of RWY 13 in use. It continued taxiing past the RWY 13/RWY 24 intersection.

At 19:19:54 NFA 142 was in the middle of RWY 13/RWY 24 intersection. PIC of NFA 142 realized he had entered RWY 13, spotted a plane on the final to RWY 13 and decided to vacate quickly RWY 13 by travelling into the closed part of RWY 24. The landing FAH 6903 was 0.5 km distant from THR RWY 13.

At 19:20:02 when the arriving FAH 6903 passed over the RWY 13 threshold and was about to land, the NFA 142 was already off the RWY 13 centreline; It crossed the warning red lights marking the unserviceable part of RWY, turned round and waited for TEC instructions.

At 19:21:12 TEC asked NFA 142 about its position. NFA 142 said it had stopped in front of the red lights on RWY 24. TEC gave the instruction to hold on short of RWY 13 with regard to the landing aircraft EZY 6503 5.5 km from THR RWY 13.

At 19:21:50 TEC cleared EZY 6503 to land. The new circumstance required new communication between TEC and NFA 142 and the airport ground personnel had to check whether or not the NFA 142 undercarriage had been damaged as the plane went over the warning lights. Neither the undercarriage of NFA 142 nor the lights were damaged. Because of the runway operations NFA 142 held its position till 19:39 when TEC told the crew that they made incursion on the runway in use and that a report on the incident would be relayed.

At 19:39:42 NFA 142 TEC instructed NFA 142 to taxi, following the signaller to the take-off position from RWY 13.

At 19:40:16 TEC cleared NFA 142 for RWY 13 enter and then at 19:41:16 for takeoff.

## 1.2 Injuries to persons

NIL

## 1.3 Aircraft damage

There was no damage to the aircraft.

## 1.4 Other damage

There was no other damage.

## 1.5 Personnel information

The responsible Danish authority did not give details on NFA 142 crew.

### 1.5.1 Personnel information ATCO

Job function		TEC/SC	GEC
Age		48	48
Day on duty		1	1
Duty duration (hours)	from beginning of workshift (including breaks)	1:17	10:17
	From the latest duty rotation	-	0:17
Practice (years)		24	11
Qualification good till		20.7.2006	10.8.2006
Latest qualification training		16.3.2004	31.3.2004

## 1.6 Information about aircraft

### 1.6.1 Information about NFA 142

Type: SW4  
Registration: OY NPA  
Manufacturer: Fairchild Aircraft corporation USA

### 1.6.2 Information about FAH 6903

Type: F-27  
Registration: HA FAE  
Manufacturer: Fokker – VFW BV Netherlands

## 1.7 Meteorological information

According to air meteorological service ČHMÚ weather conditions at Praha/Ruzyně Airport when FAH 6903 landed were as follows:

Ground wind: 170° / 7-8 kts,  
Visibility: more than 10 km,  
Cloudiness: FEW LVR base over 10000 ft

## **1.8 Radio navigation and visual aids**

Radio-navigation had no effect on the serious incident.

Visual ground aids and RWY/TWY marking are in compliance with ICAO standards. There were no stop bars at the intersection RWY 24/13. The warning red lights of unserviceable part of RWY 24 was located behind cross RWY's 24/13 short before TWY C.

## **1.9 Communications**

Communications between NFA 142, FAH 6903 crews and TEC TWR were on frequency 118.1 MHz Ruzyně Tower. Communications were legible in either way.

### **1.9.1. Air operation service procedures**

Procedures for air navigation services – air traffic management PANS-ATM specify in Part 7.5.3 the control of taxiing aircraft. A plane cannot hold off the runway nearer than is the holding position until the arriving plane has left the holding point. The Regulation L 14 (Annex 14) Airport sets the minimum distance of 75 m between the holding position and the RWY centreline.

PANS-ATM provides phrases to be used by the air traffic service staff and the pilot. The phrases referring to holding are in Part 12.3.4.8. where is also a phrase "... hold short of..."

The State-owned enterprise ATC CR issued as part of the Directive 01/04/DPLR/003 a Methodological Instruction 3.2 for using the phrase "Hold short of". The instruction says that if an aircraft is taxiing on another runway and the runways intersect, the controller uses the phrase: "taxi down the runway (number), hold short of runway (number)". In this case the captain is responsible for keeping the holding position even if the runway holding point is not determined.

## **1.10. Information about Airport**

At Praha/Ruzyně Airport the RWY 24 was unserviceable for takeoffs and landings at the time of incident. Information on RWY 24 closure was published in NOTAM A1130/04. Jeppesen publication shows in LKPR/PRG air map the intersection of RWY 06/24 with RWY 13/31. There were no stop bars at the intersection.

### **1.11 Flight recorders**

The serious incident has been analyzed using radar information SMR and communication ATCO on TWR Praha/Ruzyně. The commission did not have CVR transcript from NFA 142.

### **1.12 Description of incident site**

The serious incident took place at intersection of RWY 06/24 and RWY 13/31.

### **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**

NIL

### **1.19 Useful or effective investigation techniques**

The incident has been investigated in accordance with Annex 13.

## **2 Analysis**

The analysis will discuss the crew of SVA 7066, the aircraft, the radio communications, the ATS instructions, the airdrome information and runway markings.

### **2.1 The crew of NFA 142**

The crew received the instruction: "Hold short of RWY 13" because of operations on this runway. The crew acknowledged the instruction by the same phrase. When the airplane was approaching the RWY 13 edge, which is not marked on RWY 24, the crew's orientation capabilities were deteriorated due to the fact that runway lights on the left and right sides of RWY 13 are not installed until behind RWY 24/13 intersection and are only visible from the very vicinity of the edge of RWY 13.

In taxiing towards RWY 13 the crew thought by mistake, because of their layout, that the warning red lights of unserviceable RWY 24 are the stop bars.

The FAH 6903 making landing on RWY 13 was on the same radio frequency and the crew NFA 142 heard its landing clearance after changing from GEC to 118.1 MHz TEC. At reaching the RWY 13 edge, the landing FAH 6903 was 1 km right of NFA 142. The NFA 142 noted they entered RWY 13 on which a plane was about to land and decided to expedite vacation of RWY 13 by going over the intersection.

### **2.2 Air traffic control procedures**

Due to the use of RWY 13 and closure of RWY 24 airport operations at LKPR and its surroundings were controlled by airport control tower in accordance with procedures PANS-ATM Part 7.5.3., which are based upon visual observation, issuing instructions and adequate information.

The view of the holding position short of RWY 13 from the airport controller's workplace is obstructed at night due to the airport layout and RWY 13/RWY 24 intersection. The airport controller cannot tell positively whether a plane that had received the instruction to hold short of RWY 13 actually stopped at the right place nor can he ascertain if the plane made a runway incursion. The airport controller relied upon the NFA 142 crew to keep to his instruction that was acknowledged. Because the situation in airport operation was unusual due to the fact that RWY 24 was unserviceable and only part of it used to taxi, the effect of actual conditions on watching planes in the night was not examined from the operation point of view. Using information displayed on a taxi radar the airport controller could monitor whether the aircraft kept to the instructions. It was possible to know, through the taxi radar information, the safety risk of the FAH 6903 landing plane due to NFA 142 entering RWY 13. However using information from a taxi radar is not part of the airport controller's approved procedures.

### **2.3 Air traffic phrases used**

The instruction issued by GEC LKPR contained a phrase stressing the necessity to hold short of RWY 13. NFA 142 received this instruction the first time as

it got RWY 24 taxi clearance, and the second time when contacting TEC at 19:18:46.

Using the phrase "*hold short of RWY*" by GEC and TEC was alright and in accordance with L 4444 Regulation, Head 12 (phrases used) and Document "Radio telephone procedures and air phraseology and terminology for providing air services and making flights."

The instruction hold short of RWY 13 contained an order to stop in front of RWY 13 and was issued in time with respect to the landing aircraft. The instruction asked the crew to use visual contact. TEC read back the instruction to hold short of RWY 13 as he made a conclusion from the position of the planes that it was good to call attention to the active RWY 13.

## 2.4 The aerodrome and runway information

The NFA 142 crew could have known the RWY 13 edge visually in the night by the position of RWY 13 lights. RWY 06/24 and RWY 13/31 are equipped with runway edge lights spaced roughly at 60 m intervals. These are two-way flush lights. Apart from these lights there are also omni-directional flush lights for the circuit approach spaced at 180 m intervals. By night the left edge is very difficult to recognize from the pilot's position at 50 m of RWY 13 edge.

## 3 Conclusions

### 3.1 The commission came to the following conclusions:

- The way the temporarily closed RWY 24 portion was marked with red lights and simultaneously with runway edge lights illuminated along the whole length of RWY 24 caused the crew to make a wrong decision about the holding position;
- The instruction by the airport controller containing the phrase - hold short of runway 13 - was issued in time with regard to the landing aircraft;
- It was difficult for the NFA 142 crew to determine by observing RWY 13 edge lights the position where the airplane was supposed to stop and hold short of RWY 13 in use.

### 3.2 The causes

- The holding position was not marked clearly enough. Also the way warning marking was used to indicate closure of RWY 24 while using its taxiing portion for takeoff from RWY 13 caused the violation of the instruction issued and running over the RWY 13/RWY24 intersection;

According to Annex 13 / L 13 the event is classified as a **Serious incident/Near collision, runway incursion when avoiding action was necessary**. From the gravity of possible consequences point of view the event is classified as "**Serious incident**".

## **4 Safety recommendations**

Regarding the RWY Safety Programme the following safety recommendations were discussed and put through:

**4.1** A NOTAM has been issued providing for RWYs 24/13 configuration for landing, entering RWY 13 via RWY 24 with description of the holding position short of active RWY 13.

**4.2** Runway protecting lights of type A were installed on RWY 24 placed at the possible holding position for RWY 13. They are in operation only when RWY 13 is used. RWY 24 manually operated by TEC would be used for entering RWY 13.

**4.3** During the 2005 scheduled building alterations of the runway and taxiway system the holding point to enter RWY 13 from RWY 24 should be fitted with a red light stop bar, which along with protecting lights will be hand-operated by TEC.

Prague, 15<sup>th</sup> of May 2005