



KÖZLEKEDÉSBIZTONSÁGI
SZERVEZET

TRANSPORTATION SAFETY
BUREAU

FINAL REPORT

2010-004-4P
Serious incident

LHBP
06 January 2010

Fokker 100
HB-JVE

The sole objective of the technical investigation is to reveal the causes and circumstances of aviation accidents, incidents or irregularities and to initiate the necessary technical measures and make recommendations in order to prevent similar cases in the future. It is not the purpose of this activity to investigate or apportion blame or liability.

INTRODUCTION

The present investigation was carried out by the Transportation Safety Bureau of Hungary on the basis of

- Act XCVII of 1995 on aviation,
- Annex 13 identified in the Appendix of Act XLVI. of 2007 on the declaration of the annexes of the Convention on International Civil Aviation signed in Chicago on 7th December 1944,
- Act CLXXXIV of 2005 on the technical investigation of aviation, railway and marine accidents and incidents (hereinafter referred to as Kbvt.),
- MET Decree 123/2005 (XII. 29.) on the regulations of the technical investigation of aviation accidents, incidents and irregularities;
- In absence of other related regulation of the Kbvt., in accordance with Act CXL of 2004 on the general rules of administrative authority procedure and service

The Kbvt. and the MET Decree 123/2005 (XII. 29.) jointly serve the compliance with the following EU acts:

- a) Regulation (EU) No 996/2010 of the European Parliament and of the Council of 20 October 2010 on the investigation and prevention of accidents and incidents in civil aviation and repealing Directive 94/56/EC,
- b) Directive 2003/42/EC of the European Parliament and of the Council of 13 June 2003 on occurrence reporting in civil aviation.

The competence of the Transportation Safety Bureau of Hungary is based on Government Decree 278/2006 (XII. 23.).

Under the aforementioned regulations

- The Transportation Safety Bureau of Hungary shall investigate the aviation accidents and the serious aviation incidents.
- The Transportation Safety Bureau of Hungary may investigate aviation incidents and irregularities which - in its judgement - would have resulted in accidents under other circumstances.
- The technical investigation is independent of any administrative, infringement or criminal procedures initiated in connection with the transport accident or incident
- In addition to the aforementioned laws, throughout the technical investigation ICAO DOC 9756 and 6920 Manual of Aircraft Accident Investigation are applicable.
- The present final report shall not be binding, nor shall an appeal be lodged against it.

No conflict of interest has arisen in connection with any member of the investigating committee. Persons participating in the technical investigation shall not act as experts in other procedures concerning the same case.

The IC shall safe keep the data having come to their knowledge in the course of the technical investigation. Furthermore the IC shall not be obliged to make the data – regarding which its owner could have refused the disclosure of the data pursuant to the relevant act – available to other authorities.

The present final report

was completed as based on the draft report compiled by the IC and sent to the concerned parties – defined by law – for reflections.

During the compilation of the final report the IC has been taken into consideration the comments in connection with the draft final report submitted by the concerned parties, the changes seen justified have been incorporated into the text.

The IC maintains its opinion that the introduction of the suggested safety recommendation is necessary because its purpose is to review and to possibly modify the applied notification channels. Modification is necessary if it enables the more efficient execution of the legal obligation mentioned in the comment.

DEFINITIONS AND ABBREVIATIONS

ACC	Airport Control Centre
ADC	Aerodrome Controller
ADI	Aerodrome Control Instrument
AIP	Aeronautical Information Publication
AIR	Air Control
APP	Approach Controller
A-SMGCS	Advanced Surface Movement Guidance and Control System
ATC	Air Traffic Control / Air Traffic Controller
ATIS	Automatic Terminal Information Service
ATM	Air Traffic Management
ATS	Air Traffic Services
CTR	Aerodrome Control Zone
CDC	Clearance Delivery Controller
DAM	Duty Airfield Manager
DSV	Duty Supervisor
EC	Executive Controller
FIR	Flight Information Region
FTWR	Ferihegy Tower Control Unit
GMS	Ground Movement Surveillance
GRC	Ground Controller
IC	Investigating Committee
ICAO	International Civil Aviation Organization
IMC	Instrument Meteorological Conditions
Kbvt.	Act CLXXXIV of 2005 on the technical investigation of aviation, railway and marine accidents and incidents
LHBP	ICAO code of Budapest – Ferihegy international airport
LHCC	FIR code of Budapest FIR

LT	Local Time
LVP	Low Visibility Procedures
MET	Ministry of Economy and Transport (Gazdasági és Közlekedési Minisztérium, GKM)
METAR	Aerodrome routine meteorological report (systematic aerodrome meteorological report in meteorological code)
Mode S	Transmission mode of the more up-to-date transponder transmitting a larger amount of more accurate information.
MTCW	Ministry of Transport, Communications and Water (Közlekedési, Hírközlési és Vízügyi Minisztérium, KHVM)
Working area	The part of the aerodrome utilized by the aircraft for take-off, landing and taxiing with the exception of the aprons.
NM	Nautical Mile
NOTAM	Notice to Airmen A notice transmitted on a telecommunication network containing information concerning the introduction, the state or modification of an aviation equipment, an aviation service or support, or concerning a dangerous situation, of which the timely knowledge is essential to the (flight or control) personnel concerned with flight operations.
NTA AD	National Transport Authority, Aviation Directorate
NTA DAT	National Transport Authority, Directorate for Air Transport
PC	Planning Controller
RAD	Radar Radar control
RWY STS	Runway Status Runway occupancy indicator
SNOWTAM	A special NOTAM series, which notifies, by the use of a form, about the conditions of snow, ice or their melting, or about the dangers caused by stagnant water developed as a result of the melting of snow or ice at the movement area or about the termination of such dangerous conditions.
SV	Supervisor
TPC	Tower Planning Controller
TSB	Transportation Safety Bureau
UTC	Universal Time Coordinated

BRIEF DESCRIPTION OF THE OCCURENCE

Occurrence category		Serious incident
Aircraft	Class	Fixed wing aircraft
	Manufacturer	Fokker
	Type	Fokker 100
	Registration	HB-JVE
	Operator	Helvetic Airways A.G.
Occurrence	Date and time in local time	06 Jan. 2010, 10:50
	Location	Budapest-Ferihegy airport

The aircraft was not damaged by the incident.

The times in the present final report are given in UTC, unless indicated otherwise. At the time of the serious incident the local time (LC) in effect at the territory of the Republic of Hungary was UTC + 1 hour.

Reports and notifications

The serious incident was reported to TSB on 14 Jan. 2010, 14:20 by the Swiss aviation safety organization. TSB started to investigate the case as based on this notification.

The dispatcher of the TSB

- reported the occurrence to TSB's head of department on duty at 14:20, 14 January 2010, and
- notified the duty personnel of NTA AD at 15:03, 14 January 2010.

Investigating committee

On 14 January 2010, the Director-General of the TSB assigned the following Investigating Committee (hereinafter referred to as IC) for the investigation of the occurrence:

Investigator-in-Charge	Zoltán NÉMETH	investigator
Member	László PÁL	investigator
Member	György HÁY	investigator

Overview of the investigation procedure

HungaroControl Zrt. did not notify TSB about the serious incident.

TSB was informed about the serious incident by captain's report of the aircraft which got into the possession of TSB via the Swiss aviation safety organization.

The IC analysed the captain's report, studied the recorded radar shots, listened to the recorded radio and telephone communications. It asked HungaroControl to submit the preliminary flight safety assessment report, it interviewed the concerned ADC and TPC controllers and the driver of the snow removal vehicle. It analysed the job procedures of the GRC, TPC and ADC controllers and the head of the unit supervising the activities of the snow clearing conga line. It took photos in the control tower at Ferihegy airport shooting from the tower in the direction where runway 13R and taxiway B cross, and photos were also taken in the 3D tower simulator of HungaroControl. It asked Budapest Airport Zrt. to submit information regarding the instalment and operation of secondary surveillance radar transponders in ground vehicles. It asked for the relevant meteorological and aerodrome information regarding LHBP airport.

A short summary of the occurrence

The departing flight SWR225A got clearance to take off from runway 13R while the snow clearing conga line was operating with 6 vehicles in the crossing of runway 13R and taxiway "B". The air traffic service instructed flight SWR225A to hold its position. Due to its high speed and the slippery runway the aircraft did not do this but continued the started take off while the snow clearing convoy was just leaving the runway in direction taxiway "B2".

Following the occurrence, HungaroControl Zrt. introduced preventive correction measures relevant to the clearances regarding runway crossover and to the operation of the runway status indicator.

The IC issues 8 safety recommendations in connection with the occurrence.

1. FACTUAL INFORMATION

1.1 History of the flight

On the day of the occurrence and at the preceding night, winter weather conditions prevailed at the airport with heavy snowfalls. The surfaces of the airport were continuously cleared by snow removing and de-icing vehicles.

The aircraft with the call sign SWR225 was a scheduled passenger flight from Budapest (LHBP) to Zurich (LSZH).

Due to snow removal, runway 13R was closed but it was reopened at 09:30, shortly before the start of flight SWR225A.

When it came to taxiing to the place of take-off, flight SWR225A was instructed by air traffic control to taxi to the threshold of runway 13R. The aircraft started taxiing in the direction of 310° at 09:43. SWR225A was followed by flight ELY366. The ADC coordinated it directly, by voice communication with the GRC that by crossing the runway, ELY366 should taxi along the already cleared A1 taxiway to the threshold of 13R. In the meantime, the snow clearing conga line radioing by call sign HÓ-2 was waiting at the waiting point "B1". The snow clearing conga line got permission to cross runway 13R at 09:44:52. When SWR225A had taxied before them, the convoy drove onto the runway and started its work in the crossing of taxiway "B".

At 09:46:03, flight SWR225A, still progressing opposite the direction of the take-off roll, approximately in line of taxiway "C", received clearance to take off, the execution of which air traffic control had left to the decision of the pilot („...cleared for take-off any time.") The first vehicle of the snow clearing conga line had already driven onto the runway at this point and the other vehicles were moving towards the runway on taxiway B1.

When flight SWR225A turned into the direction of take-off and reported the start of take-off at 09:47:19, the convoy had just started leaving the runway in direction of taxiway B2.

At 09:47:33, with the expression "hold position" ADC instructed flight SWR225A executing take-off roll to hold its position. SWR225A continued take-off, while the snow clearing convoy was in course of leaving the runway.

Flight SWR225A lifted off the runway approx. 300 meters before point where the runway crosses taxiway "B". When it moved past the convoy, the snow removing vehicles were not directly on the runway, they were about 15-20 meters far from its side, but they had not yet passed waiting point B2.

The location and time of the serious incident: runway 13R, Budapest Ferihegy airport, 09:50.

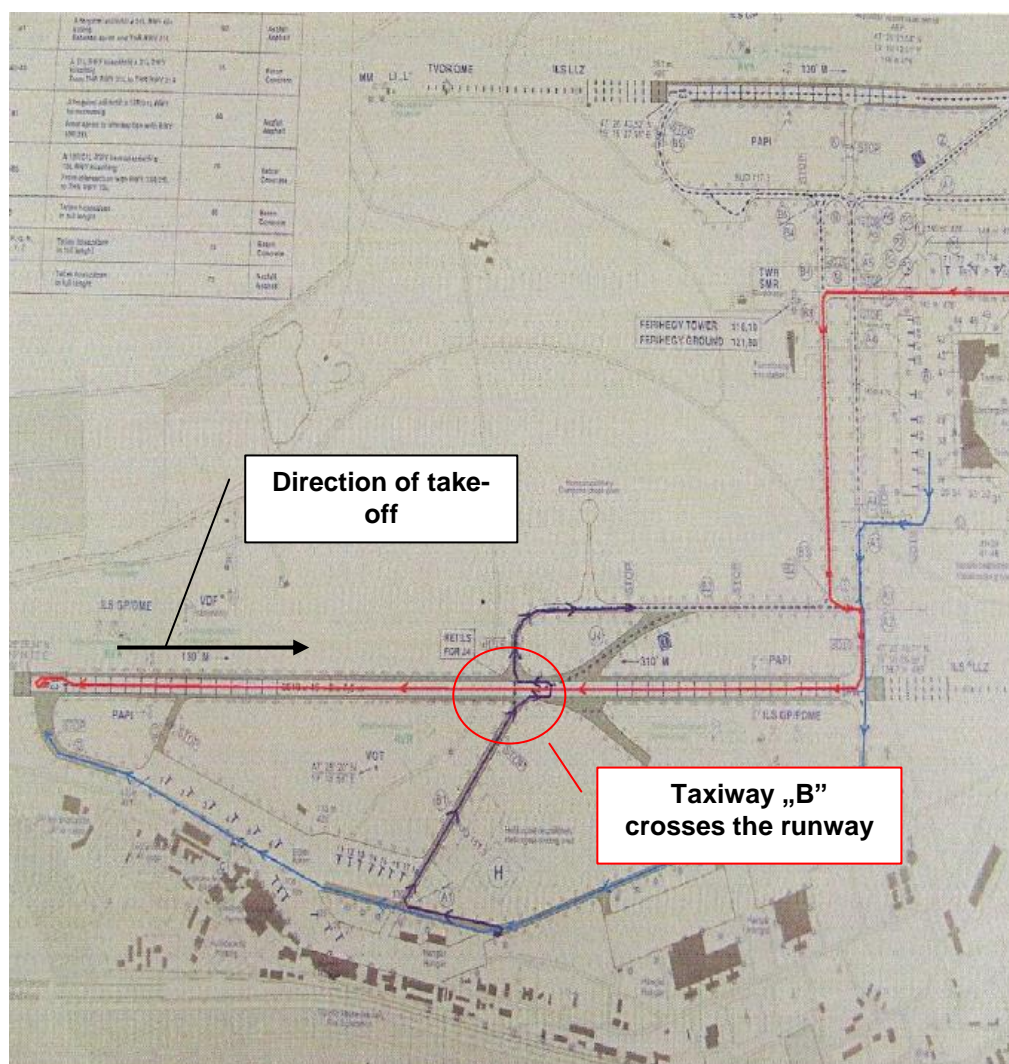


Fig. 1.

Line of movement of flight SWR225A (red), of the snow clearing vehicle line (violet) and of flight ELY366 (blue)

1.2 Personal injuries

Injuries	Crew		Passengers	Other
	Cockpit	Cabin		
Fatal	0	0	0	0
Serious	0	0	0	0
Minor	0	0	0	0
None	2	2	100	

1.3 Damage to aircraft

The incident did not cause financially relevant damage in the aircraft.

1.4 Other damage

The IC did not receive any information on further damage by the completion of the investigation.

1.5 Personnel information

1.5.1 Data of the commander of the aircraft

Irrelevant to the case.

1.5.2 Data of the first officer

Irrelevant to the case.

1.5.3 Data of the TPC controller

Age, citizenship, gender		52 year old Hungarian man
Licence data	Type	Air traffic controller
	Professional valid until	19 Dec. 2010
	Medical valid until	19 June 2010
	Certificates	LHCC FTWR
	Ratings	ADI-GMS/GMC/AIR/RAD
Time spent in the controller workplace	In the previous 6 months, in total	463:30 hours, out of which 29:30 hours as TPC
	In the previous 30 days	89:00 hours, out of which 08:00 hours as TPC
	In the previous 7 days	21:00 hours, out of which 3 hours as TPC
	In the previous 24 hours	01:47 hours as TPC
Experience within the given employment		28 years

Data of the ADC controller

Age, citizenship, gender		36 old Hungarian man
Licence data	Type	Air traffic controller
	Professional valid until	04 Dec. 2010
	Medical valid until	19 Nov. 2010
	Certificates	LHCC FTWR
	Ratings	ADI-GMS/GMC/AIR/RAD
Time spent in the controller workplace	In the previous 6 months, in total	314:00 hours out of which 124:30 hours as ADC
	In the previous 30 days	63:00 hours out of which 28:00 as ADC
	In the previous 7 days	18:00 hours out of which 11:00 hours as ADC
	In the previous 24 hours	1:47 hours as ADC
Experience within the given employment		7 years

1.5.5 Head of the unit supervising the activities of the snow clearing conga line (Hó-2)

Age, citizenship, gender		52 year old Hungarian man
Licence data	Professional valid until	31 Jan. 2011
	Certificates	Airport Operations Supervisor, Apron Supervisor
	Ratings	Internal airport driver's licence

1.6 Aircraft data

The data of the aircraft had no effect on the course of events, therefore their analysis was not required.

1.6.1 On-board warning systems

The IC revealed no findings in connection with the operation of these systems and no irregularity was reported about them.

1.6.2 The A-SMGCS system

The aim of the A-SMGCS system is to monitor in all parts of the day, in all weather conditions all movement and the presence of objects in the areas used by the aircraft to support the weather independent operation and the decision making process of the air traffic controllers.

The aim of the A-SMGCS system is to increase the (aerial and ground) surveillance reliability of the vehicles moving at the movement area, to enhance the way in which their path and the characteristics of their movement can be determined. Due to the theoretic background of the system, the desired surveillance reliability can be achieved only if the 3 primary ground radars and several active components connected to them (the multilateral receiver), the adequately operated S-mode transponders on the aircraft and the vehicle identifying systems (squitters) are functioning properly.

The system was jointly installed by HungaroControl Zrt. and Budapest Airport Zrt. The equipment was installed and technically tested in connection with the handover in October 2008.

The outfitting of the ground vehicles started on 12 February 2009, and they were still going on at the time of the occurrence. The radio permission of the equipment was issued by the National Infocommunications Authority to Budapest Airport Zrt. on 9 December 2009. At the time of the occurrence the operation licence of the transponders had not yet been issued by the National Infocommunications Authority, thus they were not transmitting an individual identifying code.

According to the experience gathered by the users and operators of the system since its instalment, there was one significant observation regarding its use: in case of intense rain, the number of false primary targets increases. At the time of the occurrence in question, such increase in the number of primary targets was not observed.

1.6.3 Runway status indicator (RWY STS)

The structure of RWY STS:

The figure displayed on the monitor consists of three main parts. The lower and the upper third depict the two runways, the middle third is the information field.

- a) The parts representing the two runways consist of the following units:
- The field depicting the runways, with the identifier of the runways within them.
 - At the end of the runway symbols, a smaller field can be found, which serves the purposes of indicating the intention of terminating runway occupancy.
 - The warning field "EXTREME WIND", which is activated automatically, is a rectangle displayed next to the runway fields.

b) Components of the information field:

- Fields indicating the operational environment depending on weather conditions (VMC, IMC, PREP, LVP1, LVP2).
- Display of the accurate date and time. The clock displays the flow of time with a 5 seconds accuracy.
- Fields representing the four available runway directions, and fields indicating the different ways from where it is possible to approach the runways.

Operation and use of RWY STS**Runway occupancy**

When the runways are clear, the fields are displayed in a green colour, the identifier of the runway is black. When work is to be authorized on the runway, the TPC touches the relevant runway area on the screen. The field is activated and it starts flashing red until the ADC acknowledges the change by touching the flashing part. Then, the runway identifier becomes red.

At the same time, at the side of the runway identifier the field serving the purposes of initiating runway leaving appears. When the ADC initiates the process of leaving the runway, he/she touches this field which attracts the attention of the TPC by flashing in green. The TPC acknowledging the request touches the flashing field which in turn becomes a steady green, indicating that the request is acknowledged, the runway is being vacated.

When it has been reported that the runway is free, the TPC touches the red runway. The runway starts flashing green until the ADC acknowledges the change by touching the field of the given runway. At the same time the runway and *the field used for the initiation of leaving ceases to flash, they become green again.*

It is not possible to interfere with the runway occupancy signs or their control from the SV workstation but all operations are displayed in order to inform TWR SV.

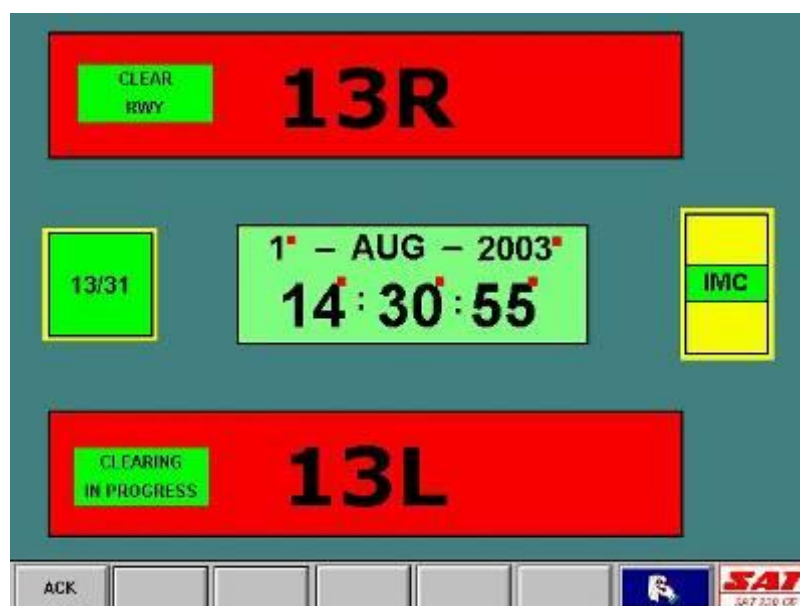


Fig. 2.
Display of RWY STS

1.7 Meteorological data

The occurrence happened in daylight, by an overcast weather. The wind was weak and easterly at the airport, humidity and a light snowfall reduced visibility to 3-5 kilometres. The ceiling of thinning clouds was at approx. 60 meters, while at around 250 meters it was entirely overcast. Both the temperature and the dew point were below zero, with a value of minus 1 degree. The measured breaking action on the runways was good in the landing zones, beyond that it was medium-weak.

The METAR issued for LHBP at the time of the occurrence (between 09:00 and 10:00):

METAR LHBP 060900Z 07007KT 3200 -SN BR FEW002 OVC008 M01/M01 Q1000 R13L/590616 R13R/650333 NOSIG=

METAR LHBP 060930Z 07007KT 3200 -SN BR SCT002 OVC008 M01/M01 Q1000 R13L/590616 R13R/650333 NOSIG=

METAR LHBP 061000Z 07006KT 5000 -SN BR OVC006 M01/M01 Q1000 R13L/590616 R13R/650333 NOSIG=

1.8 Aids to navigation

The navigational instruments had no effect on the course of events therefore their analysis was not required.

1.9 Communication

The crew of flight SWR225A communicated with the ADC controller on frequency 118.100 MHz.

The snow clearing conga line with the call sign HÓ-2 communicated with the TPC controller on ground channel STORNO-1.

The analogue ground to ground voice communication system used at the time of the occurrence was replaced by February 2010 by the so-called digital radio system.

1.10 Aerodrome information

The scene of the occurrence was Budapest Ferihegy International Airport (ICAO code: LHBP) which disposed of a valid operating licence.

As it was snowing, snow removal was continuous at the airport. Secondary surveillance radar transponders (squitters) were operating in the snow clearing vehicles, but due to a lack of permission from the authority they were not transmitting an identification code, thus relevant identifying labels were not displayed on the monitor of the ground radar.

Air traffic at the airport was moderately intense. Although the runway was being cleared continuously, the strong snowfall reduced breaking action rapidly.

Arriving at LHBP, SWR225A used runway 13R for which ATIS categorized the breaking action as “medium-good”, “medium”, “medium-poor”. However, after landing, the crew characterized the breaking action as “poor” in the whole length of the runway.

Runway 13R/31L was closed between 08:35 and 09:30 due to clearing, then 13R was reopened at 09:30.

Data regarding the right runway number 13 (13R) was not made available either in the automatic broadcast (ATIS) or at ATC radio frequency.

At 06:40 and at 10:15, a SNOWTAM report was published regarding the airport (see Appendix 3.). According to the data collected at 10:15, the runways were covered in 70% by water and in 30% by slush.

1.11 Flight recorders

Regarding the equipment of ATC and the aircraft, the required flight recorders were operative and the data recorded by them were usable.

The IC found that recording the data of ground radio communication in the tower, a manually set time was used not matching the one used either by the radar and the ground radar. Consequently the time recorded by the two systems differed by approx. 25 seconds.

1.12 Wreckage and impact information

The incident did not result in a wreckage.

1.13 Data of the medical investigations

There was no proof indicating that physiological factors or other hindrances affected the cockpit crew.

1.14 Fire

There was no fire in connection with the occurrence.

1.15 Chances of survival

There were no personal injuries.

1.16 Tests and research

During the investigation, the IC had the movement of the snow clearing vehicles simulated in the 3D tower simulator of HungaroControl in line with the given weather conditions, and it also investigated the visibility of the snow clearing convoy in the crossing of runway 13R and taxiway "B". The scenes seen in the simulator were compared with the photos taken at the ADC workstation of the airport's control tower.

During the tests the IC revealed the following findings.

- The representation of the crossing created by the simulator matches the real view but the pillars belonging to the structure of the tower do not figure on it.
- The real life movement of the snow clearing convoy and the movement to be observed in the simulator are not the same.
- The real visibility of the snow clearing convoy from the tower is reduced by the pillar obstructing the view. The pillar is extensive enough to partially or entirely block out of view the snow clearing convoy. This circumstance is not represented by the simulator.
- According to the simulation run in line with the weather conditions recorded at the time of the occurrence, the snow clearing vehicles were visible in the crossing of runway 13R and taxiway "B".

1.17 Organisational and management information

Work procedures of the Air Traffic Services (ATS Manual)

The local rules regarding the provision of air traffic services are laid down by the ATS Manual (description of work procedures). In the course of providing services, the requirements of the effective legislation, the inner regulations and instructions, as well as the local rules included in the ATS Manual are to be applied.

The ATS Air Traffic Directorate is responsible for the development of the ATS Manual, in cooperation with Budapest Air Traffic Control Centre, Airport Control Centre and with ATS Operative Planning Division.

Publication of the ATS Manual is the responsibility of the ATS Air Traffic Director.

The Air Traffic Directorate decides about the publication of the entire, consolidated version of the ATS Manual at the end of each year, after negotiations with the units responsible for the preparations. The ATM Manual is to be modified if a change in legislation or a change in the ATM system make the modification, supplementation or the specification of the local requirements necessary.

Organizational structure of Ferihegy airport control tower (TWR)

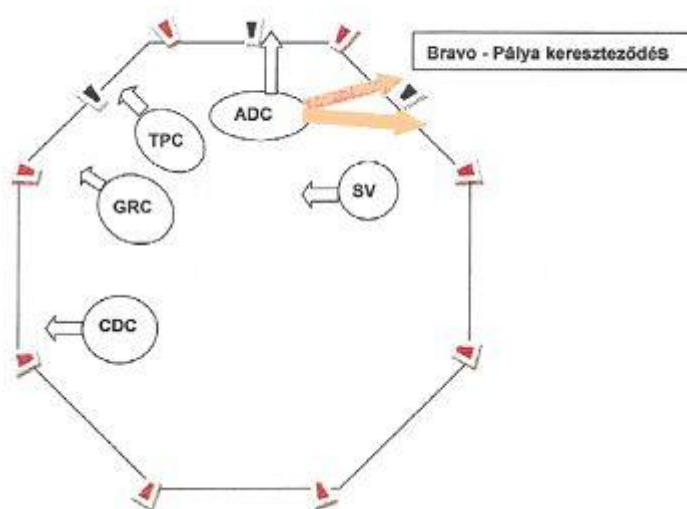
The unit provides services to the departing and arriving aircraft in the designated airspace Ferihegy CTR.

TWR has five workstations:

1. The tower supervisor (TWR SV) who is responsible for the operative management of the tower service unit.
2. **The aerodrome controller (ADC) who controls aircraft operating on or crossing the runways or operating in the aerodrome control zone (CTR).**
3. The ground controller (GRC), who controls the traffic of aircraft operating on the taxiways and who communicates by radio with the aircraft operating at the aprons.
4. **The tower planning controller (TPC) who supports ADC and GRC in the operative planning/management of air traffic. He/she counterchecks the data of the departing/arriving aircraft with the aerodrome services and coordinates the relevant data with the other sectors of Budapest ATS Centre. He/she is responsible for the direct authorization of the movement of vehicles operating on the taxiway and on the runway and in their safety zones (determined by the Airport Rules). These authorizations are carried out via radio communication and the movements are coordinated with the ADC and the GRC.**
5. The clearance delivery controller (CDC) who issues en-route clearance to the departing aircraft and forwards slot data to the aircraft.

The number of operating workstations is determined by TWR SV depending on traffic intensity.

The arrangement of the workstations in the control tower is shown in the following figure:



Task of Hó-2

Operation of the snow clearing conga line requires considerable attention, especially in the working area. In order to ensure efficient clearing and a safe separation from air traffic, operation of the snow clearing conga line is supervised by Hó-2, a person with a licence and proper knowledge about the layout of the airport and the characteristics of traffic. His/her task is to supervise the activities of the conga line. The task of Hó-2 is to secure the activities of the conga line in the working area, to coordinate the movement of the vehicles under his/her control with the TWR unit and to obtain and report the necessary permissions and clearings.

1.18 Additional information

The occurrence came to the knowledge of TSB by way of information from the Swiss technical investigative body, i.e. the reporting procedure of HungaroControl was not functioning properly.

Instalment of the A-SMGCS system (the ground radar and the ground equipment compatible with it) was not a centrally managed, or at least a harmonised project, but rather a bundle of jobs where all the different players strived to solve their part of the problem individually, according to their own field of expertise. This reduced the efficiency of the project and induced considerable uncertainty because the different participants were not aware about the progress of the others.

Budapest Airport Zrt. did not make data available about what kind of rules had been adhered to by the drivers of the ground vehicles since the end of the test period on 09 April 2009 regarding the operation of the transponders installed in the vehicles.

The so-called ATS Manual, laying down the work procedures of HungaroControl air traffic services did not properly regulate the use of runway occupancy indicator at the time of the occurrence. By issuing a bulletin, HungaroControl provisionally corrected this shortcoming after the occurrence.

1.19 Useful or effective investigation techniques

The investigation did not require techniques differing from the traditional approach.

2. ANALYSIS

Aspects relevant to the weather conditions

There were intense snowfalls at LHBP airport preceding the occurrence. As a consequence, several snow clearing machines were active at the working area of the airport. It was the TPC in the air traffic control tower who was responsible for coordinating with these units. Due to snowing, the communication needs with the ground units had largely increased, thus prior to the occurrence even two controllers were designated TPC to enable them to manage the relevant tasks. However, at the time of the investigated occurrence there was only one TPC.

Even though the clearing of the runway was continuous, breaking action was quickly reduced by the strong snowfall. As a result of this, airplanes were taxiing slowly and they also left the runway slowly. Even though there was an increased safety gap, this led to two preceding flights going around, because the airplanes having landed before them were still on the runway. The TWR SV filled in a report about the go arounds, the relevant entries were made at 09:15 and at 09:55 at the time of the occurrence.

The concerned ATC personnel participated in the fall-winter training held in September 2009. However, as IC has been informed, not all controllers possess real-life experience about operation under snowy weather conditions or are to apply this knowledge rarely.

Activities of air traffic control and the snow clearing vehicles

Paragraph 1.3.7.1. "Authorization of operating on runways" in Part III. Ferihegy TWR Work Procedures of ATS Manual 4th Edition lays down the following:

"When authorizing operation on runways, TWR shall inform the ground vehicles about the presumable timeframe when the runway is free for operation as based on the available air traffic data."

Such information was not provided to Hó-2.

HÓ-2 kept in contact with the TPC controller on channel STORNO-1, who, having coordinated it with the ADC, authorized him to cross the runway at 09:44:52

The channel STORNO-1 was much engaged by the communication of the TWR, the DAM, the snow clearing vehicles and other ground vehicles and stations which made it difficult to isolate the really important information from the radio communication (in Hungarian ATC jargon this would be called a "birdhouse effect").

According to the X. "Rules and regulation regarding communication" Section of the Budapest Airport Zrt. 2009/2010 Manual on Snow Clearing and De-icing:

„The capacity of the present radio network is strongly limited. Thus, it happens more and more often that the system breaks down due to the amount and characteristics of the communication on the FTWR channel, frequently information overlaps and the communication becomes incomprehensible.

This condition is extremely dangerous to air safety and it might also be the cause of serious delays!"

.....

According to paragraph 1. "On channel TWR-1 only communication regarding the control and organization of traffic may be conducted between 15 November 2009 and 15 March 2010"

Budapest Airport Zrt. upgraded the utilized radio network after the occurrence. The digital radio system was introduced in February 2010. Aim of the switchover was to provide more channels for voice communication in the system so that the "birdhouse

effect” of the channels does not develop, the amount of communication at the different channels can be reduced.

Communication between the ADC and the TPC controllers did not take place on recorded channels, thus there is no recorded trace of the coordination regarding the runway crossing of Hó-2. Nevertheless, it highlights how much the TPC was occupied if it is considered that ADC managed the runway crossing of the other departing aircraft, ELY336, directly with the GRC controller because the TPC could not be contacted. The investigation could not establish how effective the coordination was between ADC and TPC, i.e. how much ADC was aware about the planned movement of the snow clearing conga line and about the clearances it was given. It could also not be established how much the TPC was aware about the planned movement of SWR225A and the clearances it was provided with.

At the start of the winter season, the ADC air traffic controller participated in the training for the winter time operation held in the 3D tower simulator of HungaroControl. Nonetheless, in reality the snow clearing convoy did not follow a straight line, as it can be observed in the simulator, but it shifted the evolving snow ridge to the side of the runway (as it had been previously discussed by the drivers on channel STORNO-1 at 09:43:50). So, the controller did not expect the runway to be occupied for a longer time interval. Consequently, “crossing the runway” had a different meaning for the convoy than for the controllers.

According to the 7th paragraph, in work procedure IXi2 in the Section IXi. “Clearing the runway system” of IX. “Order of clearing the airside areas” Section of the Budapest Airport Zrt. 2009/2010 Manual on Snow Clearing and De-icing: *“It has to be endeavoured to cut and reduce the ridge created where the taxiways leave the runway.”*

As a consequence, the convoy first did not move in a crossing straight line but to the right, in a southern direction, then it returned to the left and finally left it by turning right, removing this way the evolving ridge in accordance with the work procedure. This meant, however, that the snow removing convoy stayed much longer on the runway than they would have done in case of a normal runway crossing.

In the course of the occurrence the operating ground radar was not utilized to control traffic, thus it was also not used to check at the time of granting take-off clearance whether the runway was free.

The part “9.1.2. Switching on the airport’s ground radar”, Section 9. The airport’s ground radar, Appendix 3. of ATS Manual (4th Edition) stipulates the following:

„9.1.2. Switching on the airport’s ground radar

The ground radar shall be switched on in the following cases:

- *independently of the part of the day, the ground radar is to be operated in LVP1./LVP2.;*
- *if the SV, the ADC, the GRC, or the TPC judges that he/she cannot observe the runways, the taxiways and their safety zones with the naked eye.”*

When issuing the take-off clearance of SWR225A, the ADC controller did not perceive the snow clearing convoy in the „B”-13R crossing. Retrospectively it could not be established exactly whether, seen from the perspective of the ADC, the convoy present on the B1 taxiway and then turning right was blocked from view by the pillar belonging to the structure of the control tower and located in the given direction, but this possibility cannot be ruled out either. Furthermore, the position of the shades, equipping the tower, could also not be reconstructed, although they might have reduced the view as well.

Since it was not LVP1./LVP2. and in the judgement of ATS the four ends of the runways were visible from the ADC workstation, use of the ground radar was not obligatory.

The secondary signals from flights SWR225A and ELY336 and from the convoy were clearly discernible on the display of the ground radar during the occurrence.

The IC has established as based on the information collected, that the TPC had acquired an authorization for runway crossing for HÓ-2 from the ADC, before granting it.

When the TPC initiated the runway crossing of HÓ-2 and ADC authorized it, the sign indicating runway occupancy was not activated. Indeed, the work procedure is not unambiguous for such a case, as the TPC did not request a clearance for “works” but for “crossing the runway” and the work procedure did not require switching on the runway occupancy indicator on such occasions.

When flight SWR225A reported the start of take-off, the convoy had just started leaving the runway in direction of taxiway B2. The relevant vehicles were clearly discernible on the display of the ground radar. Looking out of the window, the ADC caught sight of the HÓ-2 convoy as it was leaving the runway, and instructed SWR225A to hold its position by saying “hold position”.

Since SWR225A had already started take-off roll, the expression “stop immediately” would have been the appropriate one according to paragraph g. of article 12.3.4.11. Take-off clearance, Chapter 12. Expressions of Radio Communication, in Appendix 2 of the Decree no. 16/2000. (XI. 22.) of the Minister of Transport and Water Affairs on the rules of air traffic control.

The IC found that the ADC was not aware of the exact position of flight SWR225A in the given situation and realizing the conflict induced considerable stress in him, this is why he used the expression “hold position” which came to his mind first.

The calculated V1 speed of flight SWR225A was 114 knots, its calculated VR speed was 135 knots.

As a first reaction to the instruction of the ADC, the crew of the flight reduced thrust. But then partly because in the bad visibility conditions the commander of the aircraft estimated the position of the snow clearing conga line incorrectly, he thought it was only in the last third of the runway, and partly because he believed that stopping an aircraft on the slippery runway, that had nearly reached V1, or more exactly, was progressing with 110 knots, was risky, he decided to continue take-off. Flight SWR225A lifted off the runway approx. 300 meters before the point where the runway crosses taxiway “B”. When it moved past the convoy, the snow removing vehicles were not directly on the runway, they were about 15-20 meters far from its side, thus they had not yet passed waiting point B2.

HÓ-2 announced leaving the runway at 09:51:21.

Due to a public transport strike, the ADC controller was a bit late that day for the start of the period at 07:00 (LT) but this did not influence the provision of services because he took up the position of ADC only at 08:00 (LT) a duty which lasted until 10:00 (LT). He worked in all periods in the month preceding the occurrence (except for the period between Christmas and New Years Eve) but the operator did not provide data on how many periods this meant exactly.

The occurrence happened in the last quarter of the controller’s given active duty phase. The controller was moderately heavily occupied, mainly because the landed aircraft left the runway significantly slower than usual, thus more coordination was necessary with the APP service, and even so two flights had to be instructed to go around due to runway occupancy.

In the opinion of the IC, by the end of the active duty phase, the possibility of the onset of fatigue increased significantly in case of the ADC performing under an unusual workload.

Besides, according to the recorded data in the flight safety database, the entry regarding the second go around was saved at 09:55, 7-8 minutes after the occurrence. It is a custom that TWR SV fills in the database while the controller concerned reads out to him the information relevant to the occurrence. The database does not record when the form of a new occurrence is opened, only the time when it is first saved, thus it was not to be determined in an objective way when the personnel started to fill in the form and whether this activity could have distracted the attention of the ADC. Nevertheless, it may be supposed that at the time of the occurrence or at a point of time close to that the ADC was occupied with recording the preceding go around in the database.

3. CONCLUSIONS

3.1 Factual findings

- There is no proof indicating that the structure of the aircraft or any system thereof failed before the occurrence and this would have caused or contributed to the occurrence.
- According to the flight plan, the flight was carried out under bad visibility conditions.
- The ATS personnel was authorized to carry out its tasks.
- The aerodrome personnel was authorized to carry out its tasks.

3.2 Causes of the occurrence

The technical investigation of the IC concluded that the incident happened due to the following provable reasons:

- The air traffic service did not check the exact position of the snow clearing conga line authorized to enter the runway earlier, and also it did not check whether the runway was free, before granting take-off clearance to SWR225A. Thus both of the units had permission to use the runway at the same time.
- The work procedure in the ATS Manual of HungaroControl enabled the TPC to permit the snow clearing convoy to drive onto the runway without the obligation of switching on the sign indicating runway occupancy which would warn the ADC.
- Efficient voice communication ceased between the ADC and the TPC workstations of the traffic control tower, principally due to the overload on the channel STORNO-1 operated by the TPC and at the same time on the TPC controller himself.
- The capacity of Budapest Airport Zrt.'s radio network utilized for the management of ground traffic was not matching traffic demand.

Besides the reasons outlined above, the IC supposes the following reasons:

- A pillar from the structure of the Ferihegy control tower might have blocked the snow clearing conga line from the view of the ADC controller for a short time.
- In lack of certification by the authority, the secondary surveillance radar transponders of the HÓ-2 unit did not transmit individual identification, thus the identifying labels did not appear on the radar display.
- Filling in the form of the flight safety database relevant to the earlier go around might have distracted the attention of the ADC at the time of the occurrence or at a point of time close.
- Winter weather conditions prevailed at the airport at the time of the occurrence with reduced visibility and strong snowfalls which had been going on for a long time. This happens seldom; hence the controllers do not have much experience with the operation under such circumstances.
- During the training for winter operation, the 3D tower simulator of HungaroControl did not represent the movement of the snow clearing convoy true to life.

- The pillars belonging to the structure of the Ferihegy control tower and influencing the view are not represented by the 3D tower simulator of HungaroControl.

4. SAFETY RECOMMENDATION

4.1 Safety recommendations issued during the technical investigation

During the technical investigation HungaroControl Zrt. issued the following bulletin on 30 January 2010:

BAÜ2010-004-4P-1:

1. Every time a runway crossing clearance is granted which is not authorized via the ADC frequency, the runway occupancy indicator shall be switched to the "OCCUPIED" position from the time of granting the clearance until when the runway is vacated.
2. If the runway occupancy indicator is switched to the occupied position, it is prohibited to authorize take-off and landing from and to the given runway!
3. It is the obligation of all DSVs to notify the staff, regarding which I request a feedback listing the initials of those who have acknowledged the notification. All unit DSVs shall print the present document and have the members of his/her group sign it. The signed documents are to be submitted to the ACC office.
4. It is always the responsibility of the SV on duty to monitor the execution of the present bulletin.

4.2 Safety recommendations issued during the conclusion of the technical investigation

As the conclusion of the technical investigation the IC issues the following safety recommendations:

BA2010-004-4P-1: As based on the ATS Manual the TPC may have permitted the runway crossing without the ADC switching on the runway occupancy indicator. After the serious incident, on 30 January 2010 HungaroControl Zrt. took the measures listed in paragraph BAÜ2010-004-4P-1. The IC has acknowledged these measures. Besides,

the IC recommends HungaroControl Zrt. to incorporate the bulletin issued on 30 January 2010 into the work procedures of the air traffic controllers.

The IC expects as a consequence of the measure that air traffic control will apply the runway occupancy indicator appropriately, and the occurrences similar to the one investigated will be avoidable. Further, the measures taken by HungaroControl Zrt. will become a documented part of the ATC work procedures.

BA2010-004-4P-2: The ADC permitted the snow clearing convoy indirectly, through the TPC, to cross the runway, thus ADC lost the possibility of direct control.

The IC recommends HungaroControl Zrt. to modify the ADC work procedures in such a way that the crossbar lights at the runway holding position be operated by the ADC when vehicles carry out work on the runway.

The IC expects as a consequence of the measure that from now on the ADC will dispose of a direct tool for granting clearance to the ground traffic relating to the runway which might prevent the unjustified usage of the runway in case of communication failure between the ADC and the TPC.

BA2010-004-4P-3: The concerned vehicles were clearly discernible on the ground radar during the time of the occurrence, but the use of the ground radar was not obligatory.

The IC recommends HungaroControl Zrt. to determine an objective visibility value in the work procedures below which the ADC shall use primarily the ground radar to check runway occupancy.

The IC expects as a consequence of the measure that in case of reduced visibility the controllers will use the ground radar without subjective judgement, in a standard and efficient way.

BA2010-004-4P-4: During the occurrence the term “crossing the runway” was not interpreted unanimously by the air traffic services and the personnel of the ground vehicles.

The IC recommends Budapest Airport Zrt. and HungaroControl Zrt. to apply a standard radio communication procedure according to which all vehicles that cross the runway in a straight line and at the shortest possible path shall request “crossing the runway” and all other vehicles shall request and be granted permission to “use the runway”.

The IC expects as a consequence of the measure that the clearances relative to the use of the runway and their execution will become unambiguous and clear to follow.

BA2010-004-4P-5: The 3D tower simulator of HungaroControl displays data differing from the real life data regarding the movement of the snow clearing convoy and it does not represent the effect of the pillars obstructing the view, thus it depicts a false image.

The IC recommends HungaroControl Zrt. to have the tower simulator simulate the movement of the snow clearing convoy and the pillars belonging to the structure of the control tower true to life. If this is not possible the control personnel shall be informed about the difference.

The IC expects as a consequence of the measure that during the training and renew training the air traffic controllers will acquire working methods more in line with reality.

BA2010-004-4P-6: During the technical investigation of the occurrence it was not possible to analyze the communication between ADC and TPC and between ADC and SV because they were conducted via unrecorded channels.

The IC recommends HungaroControl Zrt. to install in the tower an equipment capable of recording the voice communication in the tower.

The IC expects as a consequence of the measure that the communication between the workstations of the tower becomes analyzable, which may contribute to the development of safer work procedures.

BA2010-004-4P-7: During the technical investigation it was revealed that the lack of harmonization regarding the subprojects in connection with the instalment of the ground radar and the relevant different equipment, like the secondary surveillance radar transponders in the vehicles, led to numerous misunderstandings and the reduction of efficiency.

The IC recommends HungaroControl Zrt. and Budapest Airport Zrt. to coordinate the projects relevant to the ground radar and to the connecting equipment and to inform its personnel carrying out the operative tasks about the actual conditions.

The IC expects as a consequence of the measure that harmonization throughout the works related to installing the equipment seriously influencing flight safety will accelerate the process of instalment and proper information exchange will contribute to efficient and safe operation.

BA2010-004-4P-8: The notification system applied by HungaroControl Zrt. in connection with the case was not functioning well, hence TSB was only informed about the serious incident later by the inquiry of the Swiss investigative body who had been sent a report by the cockpit crew.

The IC recommends HungaroControl Zrt. and NTA AD to review and, if necessary, to modify the notification system and its efficiency with special attention to assuring that the occurrences which are obligatory to be reported shall be forwarded without delay to the organizations concerned.

The IC expects as a consequence of the measure that in line with the legislative background all occurrences which are obligatory to be reported will be reported and recorded promptly in the future.

Budapest, 23. May 2012

László PÁL
Member of IC

Zoltán NÉMETH
Investigator-in-Charge

György HÁY
Member of IC

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Appendix 1.

SNOWTAM FORMAT

SNOWTAM	(Serial number)	0034
(AERODROME LOCATION INDICATOR)	A) LHBP	
(DATE/TIME OF OBSERVATION (Time of completion of measurement in UTC))	B) 2010.01.06. 6:40:00	2010.01.06. 6:50:00
(RUNWAY DESIGNATORS)	C) 13R	13L
(CLEARED RUNWAY LENGTH, IF LESS THAN PUBLISHED LENGTH (m))	D) m	m
(CLEARED RUNWAY WIDTH, IF LESS THAN PUBLISHED WIDTH (m; if offset left or right of centre line add "L" or "R"))	E) m	m
(DEPOSITS OVER TOTAL RUNWAY LENGTH (Observed on each third of the runway, starting from threshold having the lower runway designation number) NIL — CLEAR AND DRY 1 — DAMP 2 — WET or water patches 3 — RIME OR FROST COVERED (depth normally less than 1 mm) 4 — DRY SNOW 5 — WET SNOW 6 — SLUSH 7 — ICE 8 — COMPACTED OR ROLLED SNOW 9 — FROZEN RUTS OR RIDGES)	F) 65 / 65 / 65	5 / 5 / 5
(MEAN DEPTH (mm) FOR EACH THIRD OF TOTAL RUNWAY LENGTH)	G) 03 / 03 / 03 mm	06 / 06 / 06 mm
(FRICTION MEASUREMENTS ON EACH THIRD OF RUNWAY AND FRICTION MEASURING DEVICE MEASURED OR CALCULATED COEFFICIENT or ESTIMATED SURFACE FRICTION 0.40 and above GOOD — 5 0.39 to 0.36 MEDIUM/GOOD — 4 0.35 to 0.30 MEDIUM — 3 0.29 to 0.26 MEDIUM/POOR — 2 0.25 and below POOR — 1 (When quoting a measured coefficient, use the observed two figures, followed by the abbreviation of the friction measuring device used. When quoting an estimate, use single digit)	H) 37 / 32 / 29 friction measuring device: SFH	18 / 18 / 16 friction measuring device: SFH
(CRITICAL SNOWBANKS (if present, insert height (cm)/distance from the edge of runway (m) followed by "L", "R" or "LR" if applicable))	J) cm m	cm m
(RUNWAY LIGHTS (if obscured, insert "YES" followed by "L", "R" or both "LR" if applicable))	K)	
(FURTHER CLEARANCE (if planned, insert length (m)/width (m) to be cleared or if to full dimensions, insert "TOTAL"))	L) m m	m m
(FURTHER CLEARANCE EXPECTED TO BE COMPLETED BY ... (UTC))	M)	
(TAXIWAY (if no appropriate taxiway is available, insert "NO"))	N) 5 B/A=1	
(TAXIWAY SNOWBANKS (if more than 60 cm, insert "YES" followed by distance apart.	P) m	
(APRON (if unusable insert "NO"))	R) 5 B/A=1	
(NEXT PLANNED OBSERVATION/MEASUREMENT (S FOR) (month/day/hour in UTC))	S) 2010.01.06.	7:00:00
(PLAIN-LANGUAGE REMARKS (including contaminant coverage and other operationally significant information, e.g. sanding, de-icing))	T)	
CONTAMINATION ON RWY 13R 50 PERCENT WET SNOW 50 PERCENT SLUSH RWY 13L 100 PERCENT WET SNOW TWYs AND APRONS 100 PERCENT WET SNOW / MEAN DEPTH 30MM		

SNOWTAM FORMAT

SNOWTAM	(Serial number)	0035
(AERODROME LOCATION INDICATOR)	A) LHBP	
(DATE/TIME OF OBSERVATION (Time of completion of measurement in UTC))	B) 2010.01.06. 10:15:00	2010.01.06. 10:50:00
(RUNWAY DESIGNATORS)	C) 13 R	13 L
(CLEARED RUNWAY LENGTH, IF LESS THAN PUBLISHED LENGTH (m))	D) m	m
(CLEARED RUNWAY WIDTH, IF LESS THAN PUBLISHED WIDTH (m; if offset left or right of centre line add "L" or "R"))	E) m	m
(DEPOSITS OVER TOTAL RUNWAY LENGTH (Observed on each third of the runway, starting from threshold having the lower runway designation number) NIL → CLEAR AND DRY 1 → DAMP 2 → WET or water patches 3 → RIME OR FROST COVERED (depth normally less than 1 mm) 4 → DRY SNOW 5 → WET SNOW 6 → SLUSH 7 → ICE 8 → COMPACTED OR ROLLED SNOW 9 → FROZEN RUTS OR RIDGES)	F) 62 / 62 / 62	62 / 62 / 62
(MEAN DEPTH (mm) FOR EACH THIRD OF TOTAL RUNWAY LENGTH)	G) 02 / 02 / 02 mm	02 / 02 / 02 mm
(FRICTION MEASUREMENTS ON EACH THIRD OF RUNWAY AND FRICTION MEASURING DEVICE MEASURED OR CALCULATED COEFFICIENT or ESTIMATED SURFACE FRICTION 0.40 and above GOOD — 5 0.39 to 0.36 MEDIUM/GOOD — 4 0.35 to 0.30 MEDIUM — 3 0.29 to 0.26 MEDIUM/POOR — 2 0.25 and below POOR — 1 (When quoting a measured coefficient, use the observed two figures, followed by the abbreviation of the friction measuring device used. When quoting an estimate, use single digit))	H) 62 / 66 / 69 friction measuring device:	66 / 67 / 67 friction measuring device:
(CRITICAL SNOWBANKS (If present, insert height (cm)/distance from the edge of runway (m) followed by "L", "R" or "LR" if applicable))	J) cm m	cm m
(RUNWAY LIGHTS (If obscured, insert "YES" followed by "L", "R" or both "LR" if applicable))	K)	
(FURTHER CLEARANCE (If planned, insert length (m)/width (m) to be cleared or if to full dimensions, insert "TOTAL"))	L) m m	m m
(FURTHER CLEARANCE EXPECTED TO BE COMPLETED BY ... (UTC))	M)	
(TAXIWAY (If no appropriate taxiway is available, insert "NO"))	N) 5 2 B/A = 2	
(TAXIWAY SNOWBANKS (If more than 60 cm, insert "YES" followed by distance apart.	P) m	
(APRON (If unusable insert "NO"))	R) 5 B/A = 1	
(NEXT PLANNED OBSERVATION/MEASUREMENT IS FOR) (month/day/hour in UTC)	S)	
(PLAIN-LANGUAGE REMARKS (including contaminant coverage and other operationally significant information, e.g. sanding, de-icing))	T)	
CONTAMINATION ON RWYS 70 PERCENT WET / 30 PERCENT SLUSH ON TWYS 60 PERCENT WET SNOW / MEAN DEPTH 10 MM/ 40 PERCENT WET ON APRON 100 PERCENT WET SNOW / MEAN DEPTH 20 MM/		

SNOWTAM Processing

SNOWTAM

Location: LHBP Priority: GG Reception: 10-01-06 06:21
Originator: EUECYIYN Operator: INO_lh_EMolnar
Filing Time: 10-01-06 06:21 Last storedate: 10-01-06 06:21
Status: Stored

SNOWTAM

SWLH 0034 LHBP 01060640
/SNOWTAM 0034

Original Message

SWLH 0034 LHBP 01060640
(SNOWTAM 0034
A) LHBP B) 01060640
C) 13R F) 65/65/65 G) 03/03/03 H) 37/32/29SFH
N) 5B/A=1
C) 13L F) 5/5/5 G) 06/06/06 H) 18/18/16 SFH
R) 5 S) 01060700
T) CONTAMINATION ON RWY 13R 50 PERCENT WET SNOW 50 PERCENT SLUSH
RWY 13L 100 PERCENT WET SNOW, TWYS AND APRONS 100 PERCENT WET
SNOW/MEAN DEPTH 30MM)

End of Report

SNOWTAM Processing

SNOWTAM

Location: LHBP Priority: GG Reception: 10-01-06 11:35
Originator: EUECYIYN Operator: INO_lh_EMolnar
Filing Time: 10-01-06 11:35 Last storedate: 10-01-06 11:35
Status: Stored

SNOWTAM

LH 0035 LHBP 01061015
(SNOWTAM 0035

Original Message

SWLH 0035 LHBP 01061015
(SNOWTAM 0035
A) LHBP B) 01061015
C) 13R F) 62/62/62 G) 02/02/02 H) 62/66/69
N) 52 B/A=2
C) 13L F) 62/62/62 G) 02/02/02 H) 66/67/67
N) 52 B/A=2
R) 5
T) CONTAMINATION ON RWYS 70 PERCENT WET/30 PERCENT SLUSH, ON TWYS 6
PERCENT WET SNOW /MEAN DEPTH 10MM/ 40 PERCENT WET, ON APRON 100
PERCENT WET SNOW /MEAN DEPTH 20MM/.
(RFACE FRICTION ON APRON IS POOR.)

End of Report

Appendix 2.

HAVAS ÁLLAPOTOK BP-FERIHEGYEN**2010.01.06 07:00-11:00 között****07:00** A folyamatos hóesésben az aktuális állapotok:**13R/31L RWY: 50% vizes hó -- 50% latyak (03 mm) B/A: 37/32/29****13L/31R RWY: 100% vizes hó (06 mm) B/A: 18/16/16****TWYS, APRONS 100% vizes hó (30 mm) B/A=1
(SNTM 0034)****A területen 3 db hóseprő dolgozott (tankolás, műszaki okok miatt volt hiány)****07:00 - 09:20 13L/31R RWY zárva! (fékhatás, takarítókapaicitás hiánya miatt)****A használatos pályairány 13. A forgalom a 13R RWY-ra korlátozódott.****Az induló forgalom a T1 forgalmi előterén vagy a pályán közelítette meg a felszállási pozícióját. A kevés számú hóseprő a gurulóutakat és az előterek becsatlakozásait takarította.****08:40 A folyamatosan bővülő járműparkkal megkezdődött a 13L RWY takarítása.****09:20 13L RWY megnyitva. 100% vizes hó (02 mm) B/A: 26/28/27****09:35 - 10:30 13R/31L RWY bezárva takarítás miatt.****10:30 13R RWY megnyitva. 50% vizes hó (02 mm) - 50% vizes B/A: 47/57/46****11:00 - 11:50 13L/31R RWY bezárva takarítás miatt.****11:50 13L RWY megnyitva. Aktuális állapotok:****13L RWY: 70% vizes - 30 latyak (02 mm) B/A: 66/67/67****13R RWY: 70% vizes - 30 latyak (02 mm) B/A: 62/66/69****TWYS: 60% vizes hó (10 mm) - 40% vizes B/A=2****APRONS: 100% vizes hó (20 mm) B/A=1****(SNTM 0035)****SNOW CONDITIONS AT BUDAPEST FERIHEGY****06 January 2010, between 07:00-11:00****07:00** The actual conditions during continuous snowfall:**RWY 13R/31L: 50% wet snow – 50% slush (03 mm) B/A: 37/32/29****RWY 13L/31R: 100% wet snow (06 mm) B/A: 18/16/16****TWYS, APRONS 100% wet snow (30 mm) B/A=1****(SNTM 0034)**

3 snow sweepers worked in the area (there was a shortage due to refuelling and technical reasons)

07:00 – 09:20 RWY 13L/31R closed! (due to breaking action and lack of clearing capacity)

The runway direction to be used was 13. Traffic was limited to RWY 13R.

Departing traffic approached its take-off position through apron T1 or via the runway. The few snow sweepers cleared the taxiways and the apron entrances.

08:40 Clearing of RWY 13L has been started by a constantly growing vehicle fleet.

09:20 RWY 13L open. 100% wet snow (02 mm) B/A: 26/28/27

09:35-10:30 RWY 13R/31L closed due to clearing.

10:30 RWY 13R open. 50% wet snow (02 mm) – 50% wet B/A: 47/57/46

11:00-11:50 RWY 13L/31R closed due to clearing.

11:50 13L RWY open. Actual conditions:

RWY 13L: 70% wet – 30% slush (02 mm) B/A: 66/67/67

RWY 13R: 70% wet – 30% slush (02 mm) B/A: 62/66/69

TWYS: 60/ wet snow (10 mm) – 40% wet B/A=2

APRONS: 100% wet snow (20 mm) B/A=1

(SNTM 0035)

35 / 41



Appendix 5.



Appendix 6.







Appendix 7.



Nemzeti
Közlekedési
Hatóság

Légügyi Hivatal

Közlekedésbiztonsági Szervezet

Németh Zoltán
VB vezetője

Ikt.sz:

Tárgy: Észrevétel

Ügyintéző:

Tel.:

Észrevétel

Tisztelt Németh Zoltán Úr!

A 2010-004-4P számú súlyos repülőesemény Zárójelentés-tervezet BA2010-004-4P-8 számú, NKH LH részére javasolt biztonsági ajánlására a következő észrevételt teszem.

A BA szerint a VB javasolja az NKH LH részére, hogy vizsgálja felül és szükség szerint módosítsa a HungaroControl Zrt. által alkalmazott bejelentési rendszert és annak hatékonyságát, különös tekintettel arra, hogy biztosítva legyen a bejelentés köteles események haladéktalan továbbítása az érintett szervezetek felé.

A légiforgalom irányításának szabályairól szóló 16/2000. (XI.22.) KőViM rendelet 2. számú melléklet A légiforgalmi szolgálatok eljárásai I. fejezet 7.3.1.4. pontja megfelelően szabályozza az esetre vonatkozó jelentési kötelezettségeket.

Az érintett irányítók nem tartották be a jogszabályban előírt kötelezettségüket, ami nem a bejelentési rendszer hibája.

Kötelezettségük elmulasztása miatt az irányítókat a Hatóság bírsággal sújtotta.

Budapest, 2011. június 10.



RBO osztályvezető

Kapják:

1. KBSZ
2. irattár

Repülésbiztonsági Osztály

H-1675 Budapest, Ferihegy 1. Pf.41. Telefon: +36 1 296 8877 Fax: +36 1 296 8808 Internet: www.nkh.gov.hu

National
Transport
Authority
Aviation Directorate

Budapest, 10 June 2011

Transportation Safety Bureau

Zoltán NÉMETH
Investigator-in-Charge

File no.:
Subject: Comment
Administrator:
Tel.:

Comment

Dear Mr. Zoltán Németh!

I would like to make the following comments regarding the safety recommendation # BA2010-004-4P-8 suggested to NTA AD in draft final report # 2010-004-4P about a serious incident.

According to the safety recommendation, the IC recommends NTA AD to review and if necessary, modify the notification system applied by HungaroControl Zrt. and the efficiency thereof, with special emphasis on assuring that the occurrences mandatory to report are forwarded without delay to the organizations concerned.

The notification obligations relevant to the occurrence are sufficiently regulated by paragraph 7.3.1.4 of Chapter I. ATS Procedures in Appendix 2. of the Decree no. 16/2000. (XI. 22.) of the Minister of Transport and Water Affairs on the rules of air traffic control.

The air traffic controllers concerned did not adhere to their legal obligations. This is not a problem of the notification system.

The controllers were fined by the Authority for having neglected their obligations.

Flight Safety Division
Head of Department

Sent to:

1. TSB
2. Archives

NOTE:

The present document is the translation of the Hungarian version of the Final Report. Although efforts have been made to translate it as accurately as possible, discrepancies may occur.

In this case, the Hungarian is the authentic, official version.