BEA

Accident

on 25 May 2000

at Paris Charles de Gaulle (95)

to aircraft

F-GHED operated by Air Liberté

and

G-SSWN operated by Streamline Aviation

REPORT

f-ed000525

g-wn000525

F O R E W O R D

This report presents the technical conclusions reached by the Bureau Enquêtes-Accidents on the circumstances and causes of this accident.

In accordance with Annex 13 of the Convention on International Civil Aviation, with EC directive 94/56 and with Law No. 99-243 of 29 March 1999, the analysis of the accident and the conclusions and safety recommendations contained in this report are intended neither to apportion blame, nor to assess individual or collective responsibility. The sole objective is to draw lessons from this occurrence which may help to prevent future accidents or incidents.

Consequently, the use of this report for any purpose other than for the prevention of future accidents could lead to erroneous interpretations.

SPECIAL FOREWORD TO ENGLISH EDITION

This report has been translated and published by the Bureau Enquêtes-Accidents to make its reading easier for English-speaking people. As accurate as the translation may be, the original text in French should be considered as the work of reference.

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Glossary

ADP	Aéroports de Paris
ATPL	Airline Transport Pilot Licence
CAA	Civil Aviation Authority
CNSCA	National Air Traffic Safety Commission (Commission Nationale de la Sécurité de la Circulation Aérienne)
CRM	Cockpit Resource Management
CPL	Commercial Pilot Licence
CVR	Cockpit Voice Recorder
DGAC	French Civil Aviation Directorate (Direction Générale de l'Aviation Civile)
DGV	High Speed Exit (Dégagement Grande Vitesse)
DNA	French Air Traffic Directorate (Direction de la Navigation Aérienne)
ENAC	National Civil Aviation School (École Nationale de l'Aviation Civile)
FDR	Flight Data Recorder
IFR	Instrument Flight Rules
MEL	Minimum Equipment List
NOTAM	Notice To Airmen
CC	Cabin Crew
RAT	Ram Air Temperature
SIA	French Aeronautical Information Service (Service de l'Information Aéronautique)
TWR	Control tower
LOC	Tower Control Position
SOL	Ground Control Tower Position

SYNOPSIS

Date and time
Thursday 25 May 2000 at 0 h 52 (1)

Site of accident
Paris Charles de Gaulle Airport

Type of flight
1 - Passenger charter flight IJ 8807
Paris - Madrid
2 - Cargo flight SSW 200
Paris - Luton

Aircraft
1 - MD 83 registered F-GHED
2 - Shorts 330 registered G-SSWN

Owners
1 - GIE Libellule
2 - Streamline Aviation

Operators
1 - SA Air Liberté
2 - Streamline Aviation

Persons on board
1 - 2 flight crew, 4 cabin crew,
151 passengers
2 - 2 flight crew

Summary

The MD 83 registered F-GHED was cleared to take off from runway 27 at Paris Charles de Gaulle. The Shorts 330 registered G-SSWN was then cleared to line up and to wait as "number two". The controller believed that the two aircraft were at the threshold of the runway, whereas the Shorts had been cleared to use an intermediate taxiway. The Shorts entered the runway at the moment the MD 83 was reaching its rotation speed. The tip of the MD 83's left wing went through the Shorts 330's cockpit and hit both pilots. The MD 83 aborted its takeoff.

Consequences

	Persons			Equipment	Third parties
	Killed	Injured	Unhurt	1 - slightly damaged	None
Crew	1	1	6	2 – severely damaged	
Passengers	-	-	151		

[1] Except where otherwise noted, the times shown in this report are expressed in Universal Time Co-ordinated (UTC). Two hours should be added to obtain the legal time applicable in metropolitan France on the day of the accident.

ORGANISATION OF THE INVESTIGATION

The BEA duty officer was advised of the accident on Thursday 25 May at 3 h 30 (Paris time) or 1 h 30 UTC. An investigation team was formed immediately. Three investigators, including the Investigator-in-Charge, went to the site where they met with the field investigator, who had begun work in co-ordination with police officers from the judicial authorities and from the Air Transport Gendarmerie.

During the day, the technical investigators were joined by two other BEA investigators as well as by two British investigators, in accordance with Annex 13 of the Convention on International Civil Aviation.

Readout of the flight recorders that were installed on the two aircraft took place during the afternoon and evening of 25 May at the BEA.

On Friday the 26th, working groups were formed under the co-ordination of the IIC, so as to find and gather the information required for the investigation in the following areas:

- aerodrome control,
- airlines,
- aircraft,
- flight recorders,
- airport infrastructure.

On 30 June 2000, a preliminary report was published containing the initial factual information available at that time.

Specialist pilots and controllers were associated with the work of the various groups and contributed to the writing of this report.

1 - FACTUAL INFORMATION

1.1 History of the Flight

On 25 May 2000, the MD 83 registered F-GHED, call sign Liberté 8807, was undertaking charter flight IJ 8807 for Madrid. The aircraft left stand Y4 (air terminal 1) and was cleared to taxi to holding point 27 at 0 h 12 min 40 s.

At 0 h 23 min 41 s, the crew, then in contact with the tower controller (LOC position), indicated that it had a technical problem and asked to wait. About four minutes later, the controller suggested they wait on taxiway 18[(2)].

At 0 h 29 min 33 s, the LOC controller asked the MD 83 to transfer to Ground frequency, which was done. Shortly afterwards, the Ground controller identified the aircraft on taxiway Q. At 0 h 29 min 57 s, he proposed that its crew take off from 26 right (departure AIGLE 8 Bravo).

At 0 h 38 min 25 s, the Shorts 330 registered G-SSWN, call sign Streamline 200, left stand N51 (freight area) and was cleared to taxi to holding point 27. This aircraft was undertaking cargo flight SSW 200 to Luton (Great Britain) for Chronopost.

At 0 h 44 min 25 s, the Ground controller asked the Shorts 330 if they wanted to take off from an intermediate access taxiway. The crew requested taxiway 16 and this was granted.

At 0 h 47 min 10 s, the Ground controller asked the MD 83 which, in the meantime, had solved its technical problem and after several exchanges was cleared to return to 27, to transfer to LOC frequency. The aircraft was then taxiing down taxiway Q to threshold 27.

At 0 h 47 min 52 s, the LOC controller confirmed departure AIGLE 8 Bravo to the MD 83. Following a remark from the crew who required confirmation of runway 27, the departure was corrected to departure AIGLE 8 Alpha.

At 0 h 48 min 37 s, the MD 83 received the instruction to line up on runway 27 behind a B 737 on final approach (call sign AEA 941), and to wait.

At 0 h 48 min 40 s, the Ground controller asked the Shorts 330 crew to transfer to LOC frequency.

At 0 h 50 min 45 s, the B 737 vacated runway 27 via taxiway 10, which made it pass in front of the Shorts 330.

At 0 h 50 min 52 s, the MD 83 was cleared to take off on runway 27.

At 0 h 50 min 57 s, the Shorts 330 received the instruction to line up on runway 27

[2] Maps of the aerodrome and taxiways are shown in paragraph 1.10.

and wait. The controller specified “number two”. The crew taxied onto the runway, all the while looking for the “number 1”, just as the MD 83 arrived.

Shortly before impact, the Shorts 330 Captain noticed the MD 83 beacon lights and braked.

On their side, the MD 83 crew noticed the Shorts 330 on the edge of the runway. The aircraft had by then passed V1.

At 0 h 52 min 01 s, the left wing of the MD 83 collided with the right propeller and cut through the Shorts 330 cockpit.

The MD 83 crew aborted takeoff. They informed the controller that they had just hit another aircraft.

1.2 Injuries to Persons

1.2.1 F-GHED

Injuries	Crew members	Passengers	Others
Fatal	-	-	-
Serious	-	-	-
Slight /none	6	151	-

1.2.2 G-SSWN

Injuries	Crew members	Passengers	Others
Fatal	1	-	-
Serious	1	-	-
Slight/none	-	-	-

1.3 Damage to Aircraft

The tip of the left wing of the MD 83 was damaged. The Shorts 330 starboard engine nacelle was deformed and the cockpit was partly destroyed.

1.4 Other Damage

There was no damage to the airport infrastructure.

1.5 Personnel Information

1.5.1 F-GHED

1.5.1.1 Captain

Male, aged 55

- Airline pilot's licence dated 24 January 1990
- Licence valid until 3 November 2000
- MD 83 type rating on 2 April 1997

- Total flying hours: 11,418 including 6,935 as captain
- Flying hours in the last 90 days: 153
- Flying hours in the last 30 days: 43

1.5.1.2 First officer

Male, aged 47
- Professional pilot's licence on 19 June 1981
- Licence valid until 31 October 2000
- MD 83 type rating on 3 August 1989
- CRM instructor for Air Liberté
- Total flying hours: 11,104
- Flying hours in the last 90 days: 150
- Flying hours in the last 30 days: 66

1.5.2 G-SSWN

1.5.2.1 Captain

Male, aged 41
- ATPL on 9 July 1993, valid until 31 December 2000
- Total flying hours: 2,240 including 1,005 hours on type
- Flying hours in the last 90 days: 150
- Flying hours in the last 30 days: 32

1.5.2.2 First Officer

Male, 43
- CPL on 28 June 1991, valid until 27 June 2001
- Total flying hours: 4,370 including 14 on type

The First Officer was on line-oriented flight training. Since joining the airline on 22 May 2000, he had made all his flights with the same captain with the following programme:

22 – 23 May 2000	Luton - Paris Charles de Gaulle - Luton
23 – 24 May 2000	Luton - Paris Charles de Gaulle - Luton
25 May 2000	Luton - Paris Charles de Gaulle

Prior to this, he had made two flights to Paris Charles de Gaulle as part of his recruitment. This involved the following legs:

18 -19 April 2000	Luton - Paris Charles de Gaulle - Luton
1 May 2000	Stansted - Paris Charles de Gaulle - Luton

1.5.3 The ATC Team

1.5.3.1 Tower Manager

Male, aged 31

- Arrived Paris Charles de Gaulle on 19 February 1990
- Qualified:
  - Delivery controller 7 April 1990
  - Local controller 1 July 1990
  - Approach controller 1 February 1991
  - Departure controller 1 January 1992
  - First Controller 1 September 1992, last renewal 22 October 1998
  - Team Leader 1 August 1999

On the night of the accident, he had started duty at 18.00 hours. His control period was to end at 1 h 30.

1.5.3.2 Approach Controller

Male, aged 29
- Arrived Paris Charles de Gaulle on 11 October 1993
- Qualified:
  - Delivery controller 1 December 1993
  - Ground controller 1 May 1994
  - Local controller 1 November 1994
  - Departure controller 1 July 1996
  - First Controller 1 February 1997, last renewal 20 January 2000

On the night of the accident, he had started duty at 20 h 00. His control period was to end at 1 h 30. He had had a break during which the IFR room had been grouped with the control tower.

1.5.3.3 Ground (SOL) Controller

Man, 29 years old
- Controller at Caen from 1 March 1992
- Arrived Paris Charles de Gaulle 16 December 1995
- Qualified:
  - Delivery controller 1 February 1996
  - Ground controller 1 May 1996
  - Local controller 1 November 1996
  - Departure controller 1 December 1997
  - First controller 1 September 1998

On the night of the accident, he had started duty at 20 h 00 hours. His control period was to end at 1.h 30.

1.5.3.4 Local (LOC) Controller

Male, aged 36
- Controller at Bastia from 1985 to 1990.
- Arrived Paris Charles de Gaulle 24 September 1990
- Qualified:
  - Delivery controller 16 November 1990
  - Local controller 31 January 1991

- Approach controller 1 October 1991
- Departure controller 1 July 1993
- First controller 1 May 1994

This controller had been employed as instructor at the École Nationale de l'Aviation Civile (French National Civil Aviation School) since 1 November 1998. In this capacity, he was following a qualification maintenance course at Paris Charles de Gaulle (see paragraph 1.17.1.4).

On the night of the accident, he was on his sixth day of training. He had started duty at 18.00 hours. His control period was to end at 1.h 30.

Note: the Head of Air Traffic Control was present in the control tower on the night of the accident to ensure liaison with the special operations centre (see paragraph 1.17.1). He was between the SOL and LOC positions.

1.6 Aircraft Information

1.6.1 F-GHED

Aircraft

- Manufacturer: McDonnell-Douglas Corporation
- Model: DC 9-83 (MD 83)
- Serial No.: 49576
- Date of manufacture: October 1987
- Flying hours: 27,957
- Number of cycles: 16,365
- Registration certificate No. B20306 of 11 January 1989
- Airworthiness certificate No. 110296 issued 10 January 1989 by DGAC, valid until 27 September 2002
- On-board radio operation certificate 990007148 of 30 November 1998

Engines

- Engines: JT8D-219
- Manufacturer: Pratt and Whitney

	Left	**Right**
Serial No.	P718558D	P718185D
Total hours at 11 August 1999	20,963	22,420
Time since overhaul	8,800 hours	N/D

Visibility from cockpit

The field of vision from the cockpit of the MD 83 is complete over 90° on each side of the aircraft longitudinal axis.

1.6.2 G-SSWN

Aircraft

- Manufacturer: Shorts 330 Brothers LTD
- Model: SD3-30 VARIANT 100
- Serial No.: SH 3064
- Date of Manufacture: March 1981
- Total flying hours: 15,215
- Number of cycles: 19,504
- Registration certificate No. G-SSWN/R1 of 3 March 2000
- Airworthiness certificate No. 005526/010 of 12 May 2000, issued by CAA, valid until 11 May 2001
- On-board radio operation certificate 005526/01 of 12 May 2000

The aircraft was maintained at Southend aerodrome (Essex) by RFS Engineering.

Engines

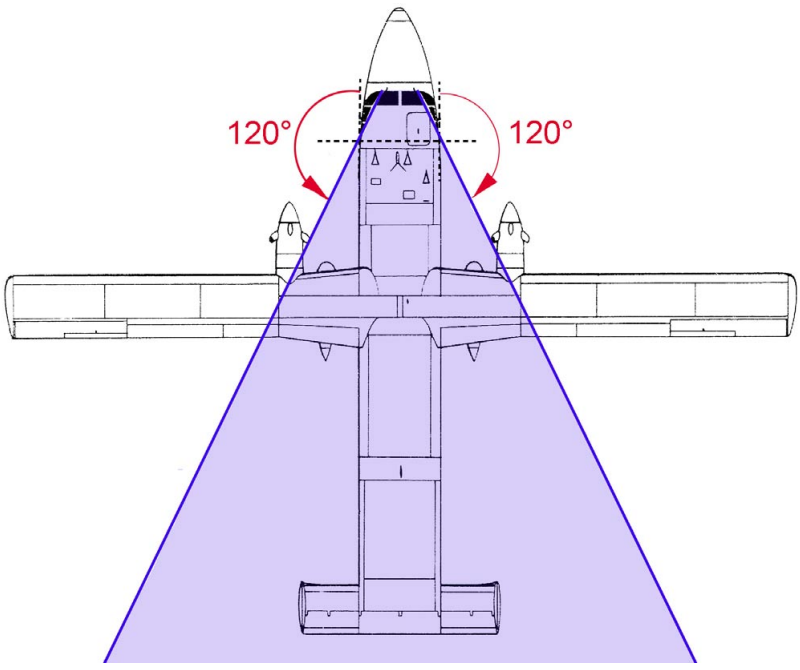
- Engines: PT6A - 45R
- Manufacturer: Pratt and Whitney Canada

	Left	**Right**
• Serial No.	PCE 84019	PCE 84308
• Total hours at 11 August 1999	23,486	5,835
• Time since overhaul	6,365 hours	1,523 hours

- Propellers: Hartzell HC-B5MP-3A, five-blade metallic

Visibility from cockpit

In the aircraft, the visual field for the pilot seated left is 120° to the left from the aircraft longitudinal axis while that of the pilot seated right is 120° to the right.



1.7 Meteorological Conditions

The Paris Charles de Gaulle meteorological station reported CAVOK conditions at 23 h 00 and 23 h 30.

At 0 h 00, the wind was at 230°/16 kt, visibility over 10 km and it was drizzling, with broken clouds up to 2,300 feet and scattered at 10,000 feet.

At 0 h 30, the wind slowly fell to 230°/14 kt and it was still drizzling.

The intensity of the rainfall on the aerodrome, as measured by the weather radar at Trappes at 0 h 50 and 0 h 55 was between 0.4 and 1.2 mm/h.

At 1 h 00 the wind dropped again and became variable in direction, with an orientation from 180 to 250° and a speed of 10 kt. Visibility, cloud ceiling and rainfall remained unchanged.

1.8 Navigation aids

The navigation aids were not used.

1.9 Telecommunications

Appendix 1 contains the transcription of the communications from the two aircraft concerned with the delivery controller and the Ground controller (SOL), as well as the transcription of all communications with the local (LOC) controller. These transcriptions were done by the Quality subdivision of the ADP North Air Traffic Department.

In the radio exchanges with ATC, the MD 83 crew spoke French while the Shorts crew spoke English.

1.10 Aerodrome Information

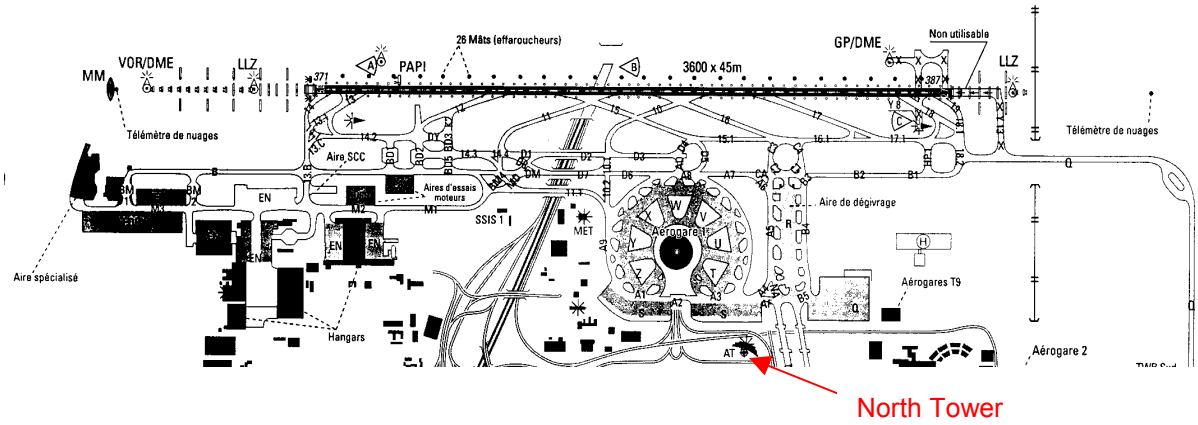
Note: the information below corresponds to the aerodrome situation at the time of the accident.

1.10.1 Infrastructure

The Paris Charles de Gaulle aerodrome had three runways including a dual runway 08/26 situated south of the platform and a single runway 09/27 having the same magnetic orientation, north of the platform.

Work was under way for the construction of a fourth runway to the north.

Runway 09/27 was handled by the North control tower situated at a distance of 1,800 m from runway threshold 27 and 1,450 m from the crossing point between emergency access taxiway 16 and the runway (there is a second South tower, which was not in service on the night of the accident). The tower is 82 metres high.

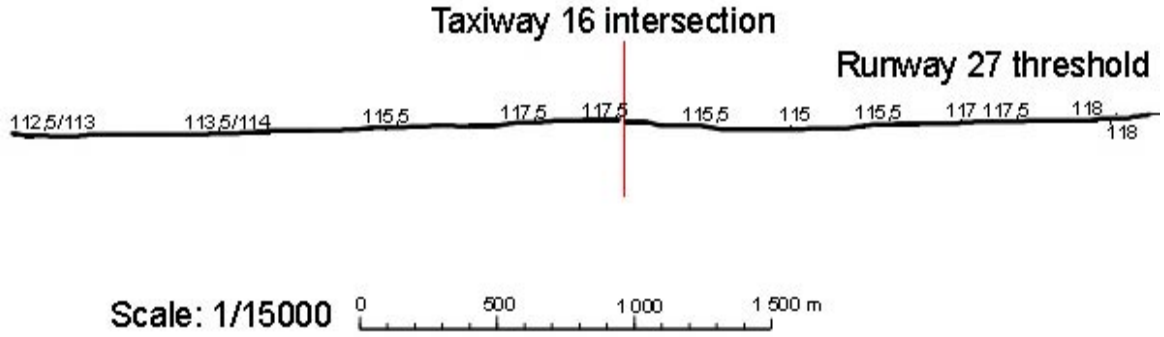


Observations made by the accident investigators showed that, at a height corresponding to that of the Shorts 330 cockpit, there were no fixed obstacles blocking visibility of the runway threshold from taxiway 16.

1.10.1.1 Characteristics of Runway 09/27

Runway 09/27 has a magnetic orientation of 88°/268°, a length of 3,600 m and a width of 45 metres.

The threshold of runway 27 is situated at an altitude of 117 metres. The crossing point between rapid access taxiway 16 and the runway, situated 1,730 metres from threshold 27, also has an altitude of 117 metres. Between these two points, the runway is slightly concave with a low point of 114 m in altitude.



1.10.1.2 Taxiways

Runway 09/27 has ten taxiways numbered 10 to 19. Four of them are for access to the runway threshold, and the other six are high speed exits (including taxiway 16). The axis of the six lanes forms a 20° angle with the runway axis. For an aircraft lined up along the axis of taxiway 16, runway threshold 27 is located at five o'clock (three quarters rear right-hand side).

Taxiway 16, 407 m long, has a CAT I holding point situated 150 m from the runway axis at an altitude of 114 metres.

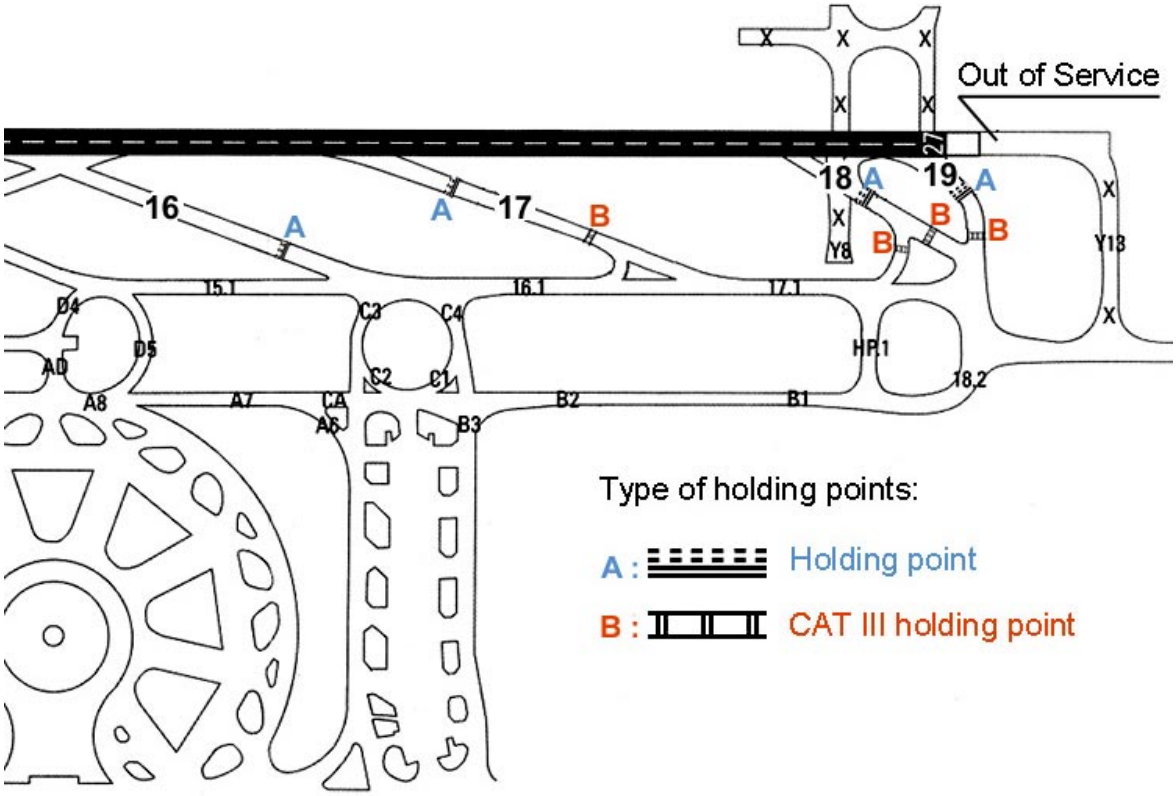
Taxiway 19, for access to runway threshold 27, has a CAT I holding point situated 90 m from the axis of the runway and a specific CAT II and III holding point 150 m from this axis.

Taxiway Q situated east of threshold 27 links the north and south areas of the platform.

1.10.1.3 Marking and lighting system

Marking system

The name of the taxiways is indicated on information signs situated at crossing points. The principle for markings applied at Paris Charles de Gaulle consists of giving direction information (e.g. “to runway 27”, etc.). Generally, there are no indications of position at taxiway crossing points. Taxiing is determined by the Ground Controller depending on the traffic. Holding point marking is as follows:



Lighting system

Runway 27, used for CAT II precision approaches, is equipped with the statutory lighting system applicable to this activity.

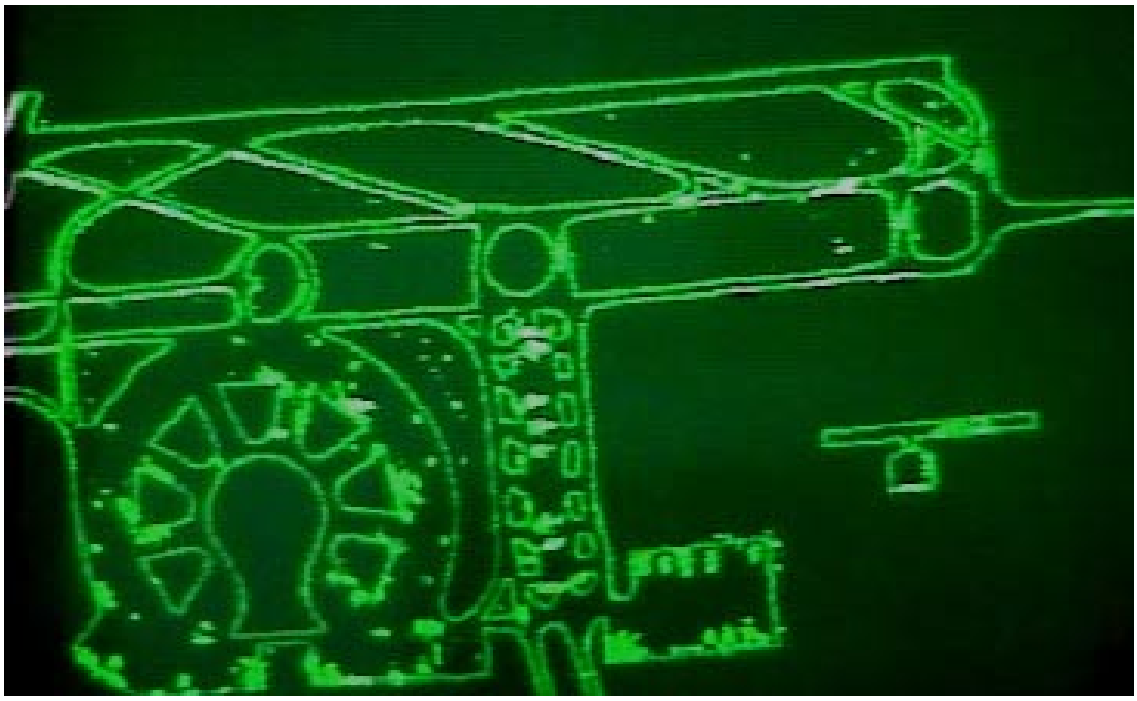
1.10.2 Radar and Ground Information Systems

Paris Charles de Gaulle aerodrome is equipped with two information systems to follow ground traffic movements: ASTRE and AVISO.

In the North control Tower:

- the SOL control positions have an AVISO image which can be replaced by an ASTRE image if required,
- the LOC control positions are equipped with a screen which usually presents the

image from the approach radar, and on which it is also possible to view the ASTRE image. A screen dedicated to the ASTRE image is placed nearby.

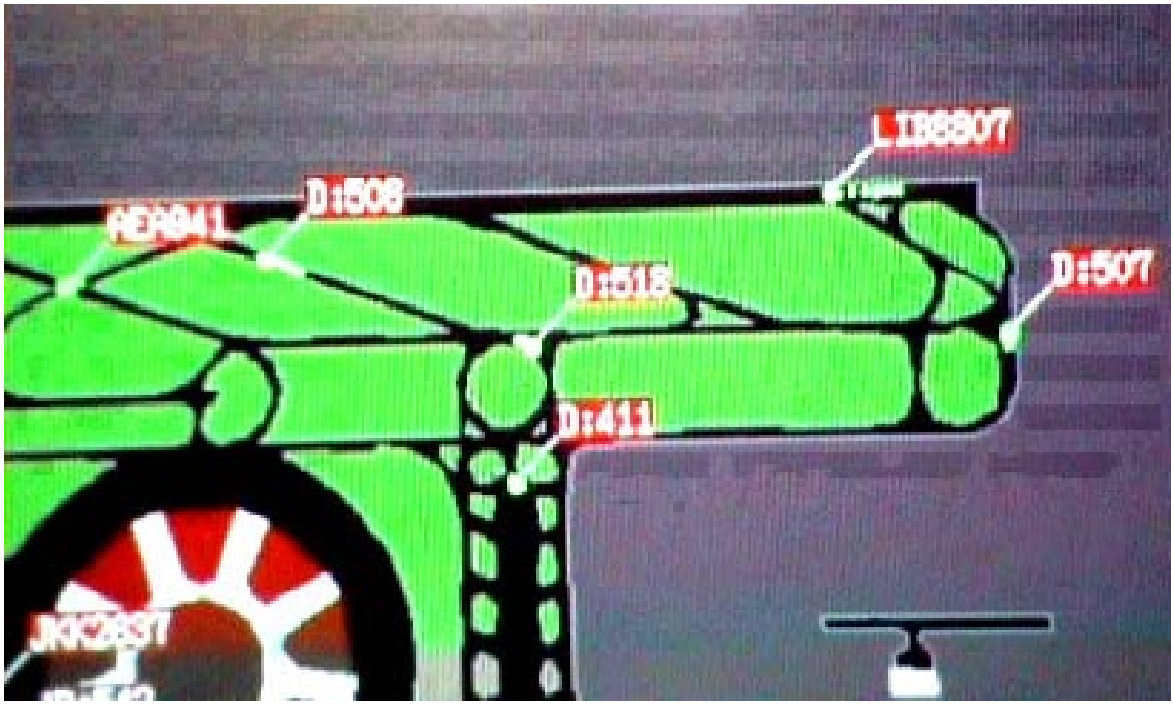


The ASTRE system uses two primary radars installed on each control tower respectively. It provides the position of the targets detected but does not identify them. The information is presented on monochrome video monitors. The image consists of a base map (runways, taxiways) and analogue plots representing the aircraft, for instance.

The AVISO system completes the information provided by ASTRE with the identification of mobile elements. For this purpose, it receives information from the following systems:

- SYLETRACK, runway vehicle radio location system,
- STR, air navigation radar processing system,
- SIGMA, air navigation server providing in particular the lists of aircraft on departure and arrival.

AVISO presents a synthetic colour image of the traffic and the identity of aircraft and other vehicles on the runways and taxiways.

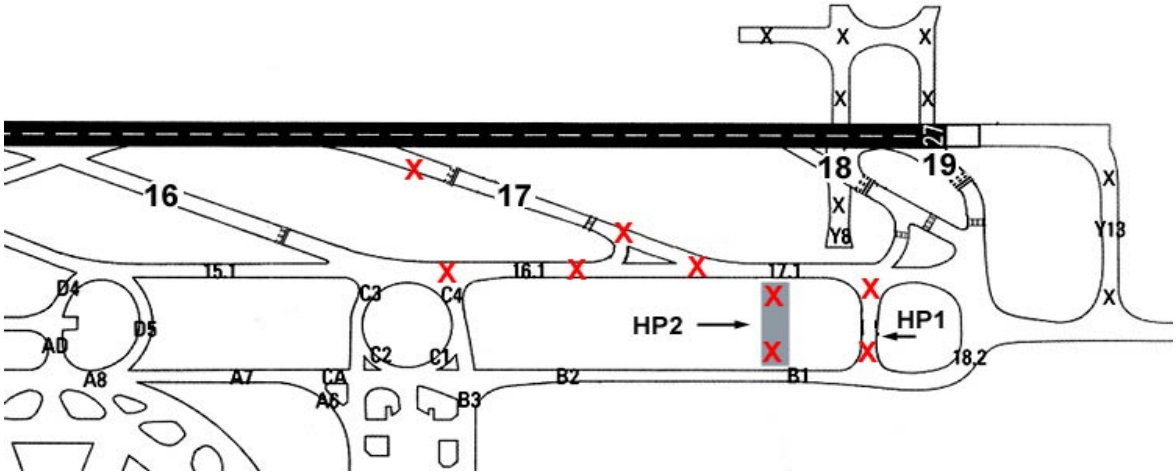


1.10.3 Work in Progress

1.10.3.1 Nature of the Work

NOTAM No. 109/99 mentioned the existence of building work for the new north dual runway, from 9 December 1999 to 7 November 2000. The work cover an area situated outside the CAT III airport protection zone (main work), plus short duration work within the airport protection zone. Additional information specified that the list of closed taxiways was communicated regularly by ADP via the RSFTA to the airline staff present at the aerodrome. This message was not addressed to Air Liberté and Streamline, since they do not have permanent staff at Paris Charles de Gaulle. However, the closed taxiways were indicated on the ATIS.

Every day, according to work progress, a map of the aerodrome was issued by the Ground subdivision and approved by the Control subdivision. This map contained details relating to the work in progress, i.e. hours of work and identification of the taxiways closed for work purposes.



On the night of the accident, taxiways 16.1, 17.1, 17 and HP1 were closed. Runway threshold 27 was served by lanes B2, B1, 18.2 and 18.1, and Q. Work was in progress for the construction of taxiway HP2. The work site was completely outside of the airport protection zone, i.e. over 150 m away from the runway axis. From 20 h 30 to 4 h 30, some ten vehicles were employed on the work site, all equipped with orange emergency flashing lights. Halogen lamps, approximately three metres high, were used to light the work site. The lights were pointed towards the ground.

1.10.3.2 Work Site Marking

A one-metre high red fence marked the edge of the work area. Warning not to enter the area was indicated by orange and white work site marking cones. The closed taxiways were indicated by red lighting.

1.11 Flight Recorders

1.11.1 Recorder Types and Readout

F-GHED was equipped with a flight data recorder (FDR) and a cockpit voice recorder (CVR):

FDR
- make: Sundstrand
- type: UFDR
- type number: 980-4100-DXUN
- serial number: 9490

CVR
- make: Sundstrand
- type: AV557C
- type number: 980-6005-076
- serial number: 9311

In accordance with the applicable regulations, G-SSWN was equipped with only one recorder, in this case a CVR:

- make: Collins
- type: 642 C1
- type number: 522-4057
- serial number: 1935

These three recorders are magnetic tape recorders, with thirty minute duration for CVRs and twenty-five hours for the FDR. They were taken in sealed containers to the BEA on the afternoon of Thursday 25 May. They were opened upon arrival.

The three recorders were in good working condition and could be examined after opening and removal of the magnetic tape.

1.11.2 Readout of Cockpit Voice Recorders

The cockpit voice recorders of both aircraft provide information on the precise activity of the crews at the time of certain significant radio exchanges. Their transcription is included in Appendix 2. The items below deal essentially with issues not related to radio communications.

F-GHED (MD 83)

The F-GHED CVR recording began at 0 h 42 min 24 s. At that time, the crew were on Ground frequency, and taxiing down the runway looking for the ramp of taxiway Q to return to holding point 27. At the same time, a discussion took place regarding a failure of the RAT indication system. The CVR recording indicates that this failure made it impossible to use the automatic throttle.

At 0 h 44 min 43 s, when the Shorts received instructions to taxi to the holding point of taxiway 16, the MD 83 crew were discussing the impact of this failure on the flight.

At 0 h 45 min 37 s, the First Officer consulted the documentation to prepare the engine operating parameters in the absence of automatic throttle.

At 0 h 47 min 10 s, transfer to tower frequency. The First Officer continued to verify the engine parameters in the documentation.

During the take off acceleration, the standard speed announcements were made by the First Officer.

At 0 h 51 min 59 s, the First Officer announced VR. The next second, a simultaneous exclamation by the two crew members was heard. The impact occurred two seconds later.

G-SSWN (Shorts 330)

The recording started at 0 h 32 min 16 s. At 0 h 37 min, the crew started up the engines.

At 0 h 38 min 20 s, the First Officer contacted the tower; he was granted permission to start taxiing.

At 0 h 38 min 50 s, the crew started taxiing.

At 0 h 44 min 43 s, the Ground controller granted permission to use taxiway 16 for departure.

At 0 h 50 min 31 s, the Captain wondered if the aircraft that had just landed on runway 27 was vacating the runway or stopping on it. The First Officer then asked "*that's the runway, isn't it?"*. The Captain replied "*Yes"*, then added "*I thought he'd just landed".*

At 0 h 51 min 01 s, the First Officer complied with the controller's instruction to line up on runway 27. Immediately afterwards, the Captain questioned the position of number one: *"here's the 'number one', is he the 'number one'?"*, then announced line-up and called for the check-list.

At 0 h 51 min 22 s, the First Officer began to call out the pre-line-up checklist. When he arrived at the item concerning flight controls, the Captain remarked that the safety pin was not removed. The aircraft was still taxiing down the taxiway and was a hundred metres away from the runway entrance. Immediately afterwards, the Captain asked the First Officer if he could see anything (presumably on his right). The First Officer replied that he could not see and added *"unless there is one coming out in front"*.

One second after that, i.e. at 0 h 51 min 53 s, the Captain asked the First Officer *"how about now?"*. There was a silence for eight seconds then, one second before the impact, an exclamation was heard from the First Officer.

1.11.3 Examination of F-GHED FDR

The F-GHED data recording shows that:

- At 0 h 51 min 11 s, the engine EPRs began to increase from 1.05 to reach 1.97 at 0 h 59 min 39 s.

- The brakes were released at 0 h 51 min 25 s and the longitudinal acceleration began to increase. At 0 h 52 min and 01 s, it became negative with -0.21 g and a peak at -1.08 a second later.

- The aircraft speed was then between 152 and 155 kt. The trim was 1.14° to 1.49°.

- The Ground/Flight parameter indicated the Flight value at one point only, at 0 h 52 min 02 s

- The brakes were applied at 0 h 52 min 03 s, the EPRs were reduced from then on (to increase again from 0 h 52 min 06 s, during thrust reverser activation). Aircraft deceleration started immediately.

- The maximum speed reached was 158.5 kt. Fifteen seconds after the beginning of the deceleration, the speed was 78 kt.

A graph of these parameters is included in Appendix 3.

1.12 Wreckage and Impact Information

1.12.1 Examination of G-SSWN

The Shorts 330 has a wing span of approximately twenty three meters and a high braced wing. The fuel tanks are located in the central part of the wing. The fuel system of the aircraft was not damaged; no leaks were observed.

The right-hand wing brace bore friction marks which were caused by the right wing tip of the MD 83. These marks are located on the lower surface of the brace, approximately 70 cm from the junction with the wing spar, and approximately three meters up. They are straight and clearly show the direction of the friction movement.

The wing was not struck directly. A slight folding of the covering at the front of the junction with the fuselage indicated it was pushed in to the front.

On the starboard engine nacelle, the lower part of the cowling was damaged, and the air inlet situated 2.8 meter from the ground was torn and pushed upwards. Two of the propeller blades were damaged. The propeller cone was undamaged.

The point of impact with the cockpit was situated above the window line, approximately fifty centimetres to the rear of the right-hand forward door frame. This door was torn off and pushed to the inside of the fuselage. The opening

created by the MD 83 wing is practically horizontal.

Inside the cockpit, the seat backs were not damaged. The MD 83 wing cut through the central column located between the two seats. It then cut into the left-hand side approximately fifty centimetres into the back of the rear left side window. The windscreen was broken and its uprights cut through.

The damage on the instrument panel was relatively slight. Some of the protective glass on the instruments was pushed in and broken. The elevator and rudder trims were on neutral. The six engine control throttles were in maximum rear position. The two fuel cut-off levers, situated on the upper panel, were in the rear position. The brake cables were broken.

1.12.2 Examination of F-GHED

The MD 83 is a twin-engine aircraft having an approximate wing span of thirty-three metres, and low swept wings.

The tip of the left wing was missing and the last rib was almost completely in place. The wing tip, found on the ground, bears traces of white paint and marks from the rivet heads on the brace of the Shorts 330.

The wing leading edge is equipped with five slats. The outside slat was damaged: it was torn and the section situated 1.30 to 2.35 m from the last rib was missing. A large piece of this slat was found on the runway. Under the damaged slat, there were two pulleys with two cables broken under load, and shearing due to the impact. The two cables were connected to the leading edge slat control.

The end of the upper wing surface bore the mark of a propeller blade impact. The trailing edge was slightly damaged in the wing sweep area. This section of the wing does not have any flight control surfaces.

At the impact point, the wing structure forming the end of the wing centre box is not used as a fuel tank. Moreover, no fuel leakage was observed on the rest of the wing, even after the aircraft had stood in the parking area for several days. Low power electrical wires were cut off at the end of the left wing. These were used mainly to supply the navigation lights. No trace of electric arc or electrical fire could be found on these wires.

1.12.3 Angle of Impact

The marks found on the right-hand side of the Shorts 330 indicate that the relative angle of the two aircraft at the time of the impact was approximately 50°.

1.13 Medical and pathological information

The investigation did not bring to light any medical anomalies affecting the crew members or controllers, liable to alter their capabilities before the accident.

1.14 Fire

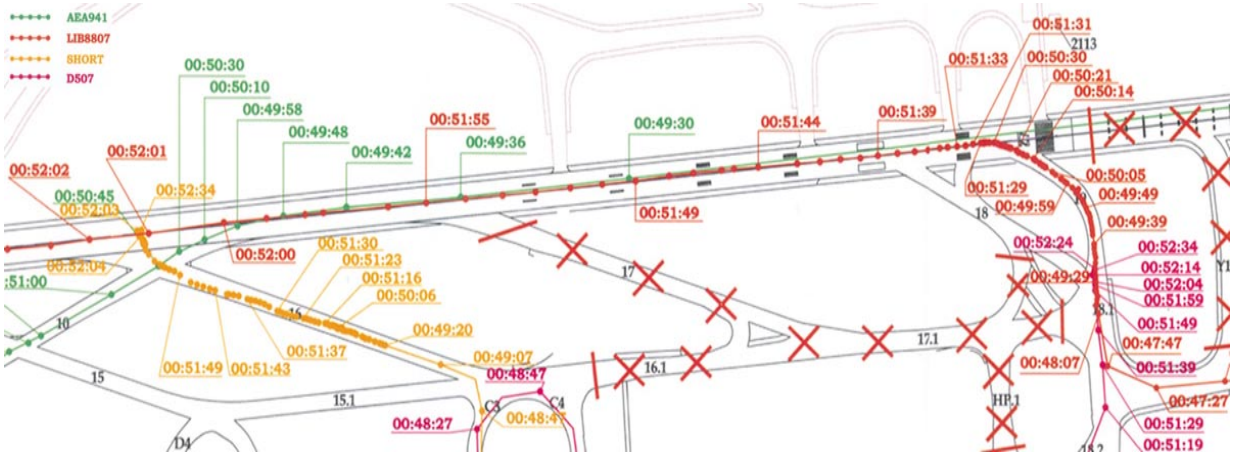
No fuel leakage or kerosene odour could be observed. The parts damaged were cold areas, and the electric wires damaged did show signs marks of electric arcing. The conditions in which a fire could start were not therefore present.

1.15 Survival Issues

The G-SSWN First Officer, seated on the right, suffered head and brain injuries causing immediate death. The Captain, seated on the left, suffered superficial injury of the cranial vault in the back median parietal area. No-one was injured in the F-GHED.

1.16 Tests and research

1.16.1 Trajectories of the Aircraft



1.16.2 Comparable events

A number of records of risks of collisions in the take off or landing phase (runway incursion type events) at Paris Charles de Gaulle were examined by the investigators. Such events may give rise to an Airprox procedure, generally on the initiative of one of the Captains involved. This was the case for events which took place on 6 October 1998 and 17 May 1999. The other events are taken from the ADP feedback system.

1.16.2.1 Airprox of 6 October 1998

On 6 October 1998, an aircraft had lined up on runway 10 (which has since become runway 08 left) from an intermediate access taxiway while another aircraft was cleared to take off from the runway threshold. The crew of the second aircraft had noticed the presence of the first aircraft on the runway and had filed an Airprox. The two aircraft involved were a B 747 operated by Air France and a Shorts 330 operated by Streamline. The reconstruction of the aircraft trajectories made by ADP is given in Appendix 4.

The file presented to CNSCA, the National Air Traffic Safety Committee, contains the following facts:

- *At 0 h 17 min 20 s, the Shorts 330, call sign SSW 200, destination Luton, was cleared to taxi to the holding point for runway 10 ("Streamline 200 taxi holding point runway 10"). The First Officer read back accordingly.*

- *At 0 h 23 min 17 s, the B 747, Call sign AFR 274, destination Tokyo, contacted De Gaulle Tour ready at holding point for take off runway 10, taxiway 23 (which corresponds to the runway threshold). It was cleared to line up while another aircraft was vacating the runway.*

- *At 0 h 23 min 57 s, SSW 200 contacted the De Gaulle Tour and reported ready for line up, without specifying its position (it was in fact on taxiway 21, one thousand metres away from the holding point). The controller gave it clearance to line up (thinking it was behind the B 747).*

- *At 0 h 24 min 08 s, the controller cleared AFR 274 for take off.*

- *At 0 h 24 min 40 s, AFR 274 asked what the aircraft lining up ahead of them was. The controller asked them to hold their position and specified that this aircraft was not on his frequency (not thinking at this stage that it could be the SSW 200). With the ground radar detecting the presence of a plot at taxiway 21 level, he asked SSW 200 to confirm its position on taxiway 21. The pilot answered "yes". The controller then asked him if he was in the process of lining up. The pilot also answered "yes".*

- *At 0 h 25 min 37 s, AFR 274 reported an airprox. The controller confirmed it must hold its position and cleared SSW 200 for take off*

- *At 0 h 28 min 08 s, AFR 274 was cleared to take off from runway 10.*

The CNSCA issued a report concerning this incident in their memo of 22 June 2000, and determined the following three causes:

- *"Non-compliance with a control instruction by the SSW 200 pilot: the taxiing clearance issued by the ground controller mentioned the runway 10 holding point".*
- *"Failure to detect conflict by the controller and issuance of conflicting clearance: while the SSW 200 was not visible on the ASTRE ground radar, the controller did not try to find out the exact location of the aircraft. He assumed that the aircraft, coming from the freight area (stand P92), was waiting at holding point 10 on taxiway 23, i.e. behind the B 747. Moreover, the controller did not have to authorise the SSW 200 to line up since the AFR 274 had not been cleared for take off. In addition, the line up of the SSW 200 should have been delayed due to jet blast caused by AFR 274 at the time of power build-up".*
- *"Phraseology: when an aircraft contacts control and asks to line up, the controller must use an adequate, strict phraseology, aimed at eliminating all risks of error concerning the aircraft position".*

Note: Streamline stated that they were aware neither of the filing of this airprox nor of its treatment by the French authorities. ADP, when asked, confirmed that a statement had been requested from the Captain but no copy of this request had been kept.

1.16.2.2 Airprox of 17 May 1999

During the investigation, another airprox, reported on 17 May 1999 on runway 08 left, drew the attention of the investigators: an aircraft had received instructions to line up from an intermediate access taxiway while another aircraft was cleared to take off from the runway threshold. The aircraft involved were two B 737's operated by Air France.

The dossier submitted to the CNSCA contains the following facts:

- *At 16 h 54 min 07 s, the B 737, call sign AF 766, destination Strasbourg, received the instruction to line up on runway 08 left behind an Alitalia aircraft due to take off ahead of it (it was at the runway threshold).*

- *At 16 h 54 min 41 s, AF 766 was cleared for take off on runway 08 left.*

- *At 16 h 55 min 07 s, the B737, call sign AF 2434, received the instruction to line up on runway 08 left, without any mention of the taxiway where it was waiting (it was on intermediate access taxiway WB).*

- *At 16 h 55 min 48 s, AF 2434 asked the controller to confirm its line up clearance on 08 left. The controller confirmed.*

- *The crew of AF 2434 informed the controller they were ahead of an aircraft ready to take off.*

- *The controller then realised the line up instruction had been given to the wrong aircraft, thinking he was giving it to a third B 737 that was at the threshold of runway 08 left. He apologised, explaining that he had confused the mentions W3 and WB when reading his strip).*

The controller who was on the LOC frequency was a duty controller at Paris Charles de Gaulle.

1.16.2.3 Other events

A list of "runway incursion" type events which occurred between January and June 2000 is included in Appendix 6. There are twenty significant events, sixteen of them presenting a risk of collision in the take off phase and four in the landing phase.

To situate this type of event in the context of data recorded in the ADP feedback system, the investigators based their work on events in September 2000. In that month, thirty three events grouped under Appendix 7 were identified. There were four runway encroachments, including three risks of collision in the take off phase and one risk of collision in the landing phase.

1.17 Information on Organisations

1.17.1 ATC Service

1.17.1.1 The context

As a result of the European League of Champions final (Madrid-Valence) which took place in Paris, additional flights to and from Spain had been scheduled for the period of 23 to 25 May 2000. Since the match was scheduled for the evening of 24 May, a large number of flights to Spain (including flight IJ 8807) took off from Paris Charles de Gaulle from 22 h 00 onwards. Special measures had been taken accordingly:

- extended use of approach room until 0 h 45 instead of 21 h 45 during the night of 24 to 25 May,
- use of the three runways,
- increased number of controllers,
- setting up of an special operations centre grouping representatives of the different services of Paris Charles de Gaulle and an engineer on standby duty. Another engineer ensured the liaison between the tower and the special operations centre so as to keep the centre informed in real time of the night's events and in particular of any flights liable to be delayed significantly.

1.17.1.2 The control positions

1.17.1.2.1 Definition of the different functions

The role of the different controllers is specified in the operations manual and the tower service memos. The following information can be found:

<u>Tower Manager</u>

- *Permanent operational responsibility for air traffic on the aerodrome, for approach*

control and partial responsibility for Le Bourget airport.
- *Permanent relations with the outside.*
- *General organisation of the Lookout Station and IFR room.*
- *Manning of control positions and compliance with operating matrices in the Lookout Station and IFR room.*
- *Analysis and short-term use of traffic data.*
- *Co-ordination between the Lookout Station, the IFR room and the adjacent centres.*
- *Grouping and segregation of SOL and LOC positions.*

Delivery: *responsible for communicating the departure parameters. In accordance with the instructions received from the Control Tower Manager, allocates the take off runways and issues initial flight clearances bearing in mind platform constraints and departure routes.*

Ground (SOL): *ensures aerodrome control on the aircraft manoeuvring area, excepting runways; provides information on the surrounding traffic and obstacles if any; ensures the regulation of the traffic on departure.*

Local (LOC): *ensures control, information and warning services for final approach, runway, initial departure and missed approach phases. Plays an essential role for optimum use of runways. In agreement wit the Control Tower Manager and after co-ordination with SOL control and the IFR room, permanently adjusts the distribution of DEPARTURE and ARRIVAL flows on the runways. Therefore, responsible for traffic regulation, determination and maintenance of segregation in the traffic volume he controls. Informs the Tower Manager on the need to turn on or off beacon lights, to change QFU (magnetic orientation), to dissociate the position.*

Note: No controller assistant post is defined but it should be noted that this post is filled on a regular basis by ATC officers.

1.17.1.2.2 Control Room Set-up

Bearing in mind the diversity of control room set-ups possible depending on the traffic at the aerodrome, only the configuration in place at the time of the accident will be detailed below.

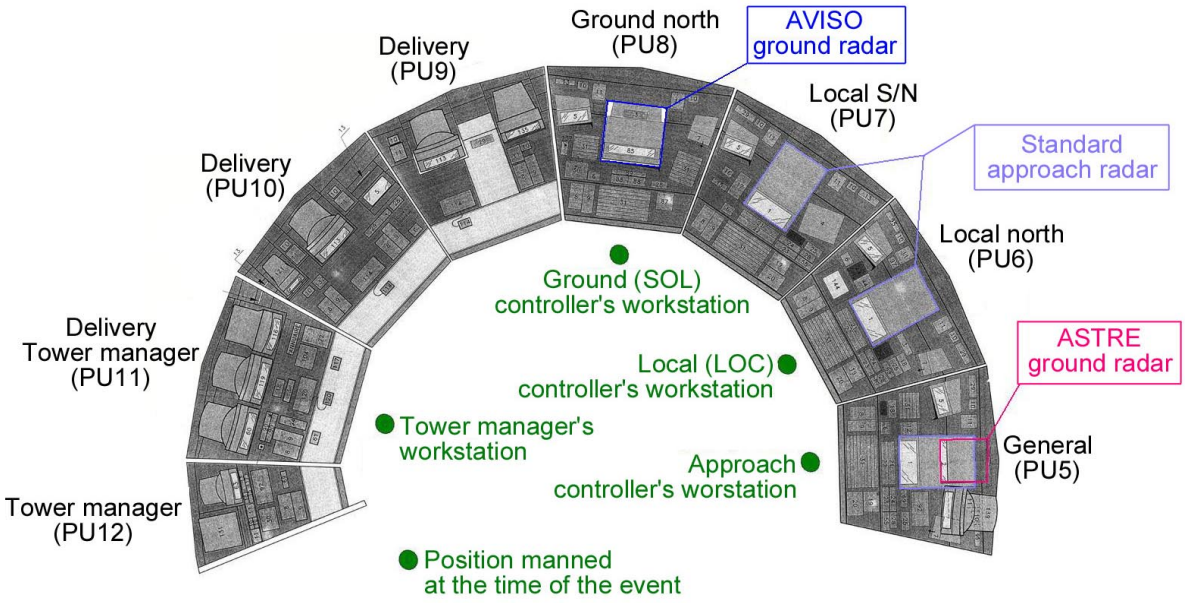
Only the North tower was in service. It is divided into two groups. The specific “South” and “North” stations are oriented towards runways 26 (South) and 27 (North) respectively.

It is possible to group traffic management at a single control position. This was the case at the time of the accident, with the following configuration:

- one delivery position, occupied by the Tower Manager,
- one ground position grouped at the “SOL North” position and occupied by the SOL controller,
- one local position grouped at the “LOC North” position and occupied by the LOC controller,
- one approach/departure position grouped at the unmarked position and occupied

by the approach controller (grouped with the IFR room),

The diagram below illustrates the location of the different positions.



Note: Only the north positions are shown here.
In fact, no south positions were manned at the time of the accident.

A panoramic photograph of the North positions is given in Appendix 5.

1.17.1.3 Procedures and practices

This chapter will address the procedures and practices of the control operations in force at Paris Charles de Gaulle regarding questions such as taxiway management, aircraft line-up management and transfer of frequencies between the GROUND and LOC positions. The reference documents are:

- the Tower operations manual from the control subdivision,
- the controller instruction manual from the instruction subdivision,
- the phraseology manual published by the SIA, a reference document appended to the Civil Aviation Code by decree of 7 September 1984,

Note: the Tower operations manual is completed by service memos having no cross-references on procedures and practices; they are not referenced in the manual and do not refer to it systematically.

1.17.1.3.1 Phraseology

1.17.1.3.1.1 Taxiing to holding point

The operations manual states in paragraph 4.2, *Phraseology applicable to taxiing*, that taxiing clearance is in the form: *Call sign, taxi to holding point runway… Time….* In paragraph 4.7.1, *Line-up from high speed exit (DGV)*, the manual indicates that line-up from a DGV is possible only if the RVR is over eight hundred metres and the ceiling over three hundred feet. In this case: *subject to acceptance by the crew and after co-ordination with LOC control, the aircraft is guided to the*

required taxiway. The taxiway number is indicated in the strip. The phraseology [to be used during taxiing] is: *Call sign, do you accept departure from taxiway No. track x?*

This issue is also addressed in the instruction manual, paragraph 3.4, *Before departure*, in the form of examples such as: *Do you accept departure from taxiway W7, distance available 2,650 metres?*

It should be noted that the phraseology does not require systematic association of the taxiing instruction with the taxiway allocated.

Specific context of the accident

During taxiing, the SOL controller asked the Shorts crew if they wished to take off from an intermediate access taxiway (DGV). The crew asked for taxiway 16. The ground controller's clearance was expressed as follows *"That's fine, so one six is approved, Streamline two hundred"*. There was no verbal co-ordination between the SOL and LOC controllers (see Testimony).

1.17.1.3.1.2 Transfer to Tower frequency (LOC)

The operations manual considers two cases of transfer: line-ups from DGVs, described without further detail in paragraph 4.7.1 previously mentioned, and the general case covered in paragraph 4.7.2, stating that transfer to Tower frequency must take place *"as soon as possible and taking into consideration the LOC position workload".*

The phraseology is then *Call sign, hold short of runway XX, contact De Gaulle Tower*... However, the transfer may be made "monitoring the frequency" and the pilots must then monitor the frequency until they are called. In this case, the phraseology used is *Call sign, monitor De Gaulle Tower frequency.*

When an aircraft is transferred to monitoring the frequency, there is no further mention of the aircraft positions by the pilot or by the controller. The waiting phase at the holding point is not covered by the manuals. In practice, frequency transfer may be performed before the aircraft reaches the holding point.

Specific context of the accident

Transfer of both aircraft to the tower frequency was performed via frequency monitoring.

1.17.1.3.1.3 Line-up

Paragraph 3.4 of the instruction manual gives an example of phraseology for a line-up from an intermediate access taxiway (DGV): *Line up runway 27, taxiway 17.*

It also gives an example of conditional line-up behind an aircraft on final: *Behind B 777 on short final, line up runway 27 and wait behind.*

In case of multiple line-ups, paragraph 7.5 of the operations manual indicates, mandatory traffic information, with the example Call sign; *line up runway 26 R, taxiway W9, No. 2 for departure behind B 737 taxiway W7.*

Particular context of the accident

The LOC controller used the conditional phraseology for the MD 83 line-up: *behind the traffic on short final on 27, line up behind and wait.*

For the Shorts line-up, the taxiway was not mentioned: *line up runway 27 and wait, number two.*

1.17.1.3.1.4 Line-ups in Sequence

Line-ups in sequence are not mentioned in the national and international reference texts.

This practice consists of authorising an aircraft to line up behind the preceding aircraft by entering the runway at the pilot's discretion. This clearance may be granted by the LOC controller before the aircraft reaches the holding point, which relieves him of line-up management.

Specific context of the accident

The aircraft scheduled for departure after the Shorts received an in sequence line-up instruction some ten seconds before the collision: *Eurotrans 9263, line up in sequence, number 3.*

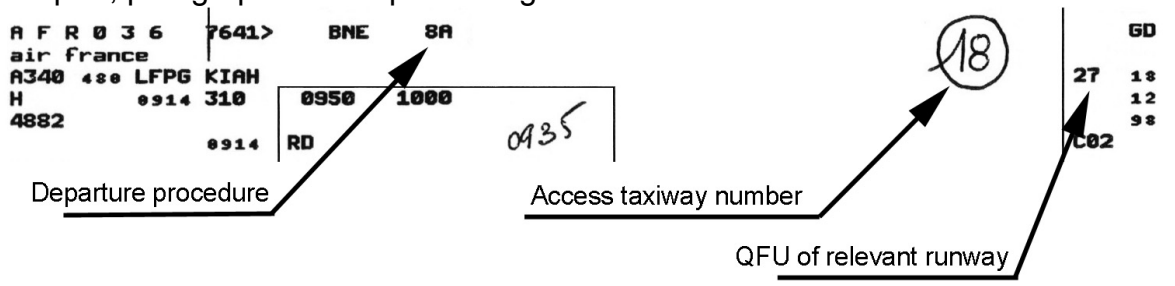
1.17.1.3.1.5 Take off authorisations

The operations manual (paragraph 7.5) and the instruction manual (module 6, paragraph 3.5) give examples of phraseology to be used for take off authorisation:

- *Call sign, wind 250°/12 kt, right-hand runway 26, cleared for take off (operations manual).*
- *Cleared for take off runway 27, wind 340°/10 kt (instruction manual).*

1.17.1.3.2 Strip management

The instruction manual, module 6, defines in chapter 4 *how to maintain the chart and strips*. The operations manual presents the following model in the Ground chapter, paragraph 4.3 "strip handling":



This example shows that:

- the QFU (magnetic orientation), 27 in this case, is printed on the right-hand side of the strip; it may be modified manually by the ground (SOL) controller,
- the taxiway number is recorded by hand and circled in the central part of the strip.

Strip transfer from the SOL position to the LOC position is performed manually at the time of frequency transfer.

Specific context of the accident

On the night of the accident, the head of ATC was helping in the physical transfer of the strips between the controllers (see paragraph 1.18.2).

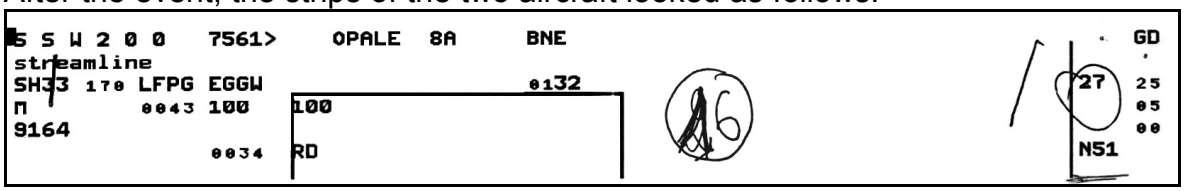
On the basis of testimony and recordings of conversations, the sequence may be re-constructed as follows:

- The MD 83 was transferred initially to the LOC controller and authorised by him to take off from 27 for departure 8A, which is recorded on the strip. When the crew asked for additional time due to a technical problem, the controller asked them to go to taxiway 18 and transferred the aircraft to the SOL controller. The Ground controller then realised that the MD 83 was on taxiway Q leading to runway 26R and proposed take off from 26R with departure 8B. He recorded this new configuration on the strip and crossed out the former configuration.

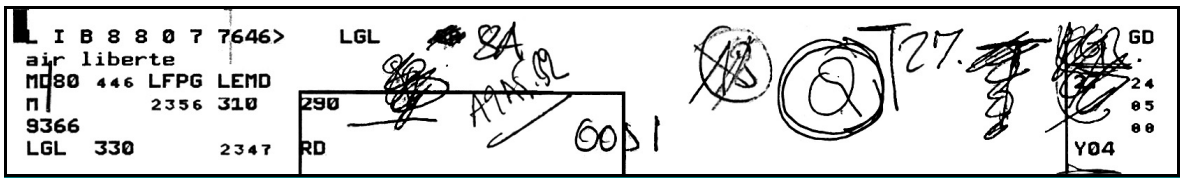
- Approximately ten minutes later, the crew asked to turn around for take off from 27, as was planned initially. The SOL controller accepted but did not update the strip completely. He transferred the aircraft again to the LOC controller. The LOC controller thought the aircraft was at the threshold of runway 26, ready for departure 8B, which was not incompatible with the information on the strip. He cleared the aircraft for take off from 26. The crew pointed out they were at the threshold of runway 27. The controller understood the confusion, updated the strip and gave permission to take off from 27.

The Shorts strip was not processed specifically. It was transferred to the LOC controller without co-ordination or any special mention.

After the event, the strips of the two aircraft looked as follows:



Shorts Strip



MD 83 Strip

1.17.1.4 Controller Qualification Maintenance

1.17.1.4.1 Air Traffic Instructors

The particular status of the LOC controller as instructor at ENAC (National Civil Aviation College) imposes periods of operational qualification maintenance, in this case at the platform for which he holds his qualification, in compliance with Decree DNA 40024.

In practice, it appears that the first day in the centre is at the controller's disposal to enable him to collect information on changes at the platform during his absence (service memos, directives, changes to the infrastructures, etc.). Then, with his agreement, the controller may be added to the duty roster. Irrespective of the duration of their absence, no procedure for instructor controllers in-service adaptation is envisaged, due to their role as instructor, which keeps them in permanent contact with ATC.

Moreover, an individual training chart is drawn up between the controller and the control centre where he is carrying out his qualification maintenance. It defines the "technical competence update and training exercise qualification programme".In the case of the LOC controller, the chart indicates that he had to undertake three or four two-week periods annually at Paris Charles de Gaulle at intervals varying between two and five months.

In the year preceding the accident, he had complied with the interval requirement of five months between his various qualification maintenance training periods.

1.17.1.4.2 Situation of the other controllers

For controllers who were not instructors, a local 1994 service memo specifies the "procedures for in-service adaptation on control positions after a significant period of absence" at Paris Charles de Gaulle:

- for an absence of less than ten weeks, "except if otherwise requested expressly by the controller concerned, qualification maintenance training, both in theory and in practice, will be under his own responsibility". No in-service adaptation procedure is planned,

- for any absence of between ten weeks and a year, a theoretical qualification maintenance course and dual programming in the lookout stations and IFR room are recommended. The in-service adaptation takes place "on request of the controllers concerned and after acceptance by the team manager".

1.17.2 Information on the Operators

1.17.2.1 Air Liberté

1.17.2.1.1 Operational environment

Air Liberté holds the statutory permission to operate commercial air transport flights under its Air Transport Certificate No. 021266, renewed by the DGAC (France) on 29 March 2000. The airline normally operates out of Paris Orly aerodrome.

1.17.2.1.2 Documentation

Air Liberté crews use aeronautical documentation published by Jeppesen. For the Paris Charles de Gaulle aerodrome, this documentation includes a map of the taxiways.

1.17.2.1.3 Directives of the Minimum Equipment List

The failure that occurred during aircraft taxiing was indicated by a flag on the total temperature indicator RAT. In this case, the Air Liberté MEL authorises the flight under acceptable deferred defect conditions, providing the EPR limits are defined manually.

1.17.2.2 Streamline Aviation

Streamline Aviation holds the statutory authorisation to operate commercial air transport flights under its Air Transport Certificate, renewed by CAA (United Kingdom) on 6 December 1999. The only activity of this airline, based in Luton, is freight transport.

From 14 September 1998, it had been serving Paris Charles de Gaulle four or five times a week in application of an express parcel transport contract.

Note: the Streamline aircraft only need a short runway length to take off. Therefore, it was usual for the crews to take off from an intermediate access taxiway at Paris Charles de Gaulle.

1.17.3 Air Traffic Incident Management

1.17.3.1 Functioning of the Airprox Procedure

The airprox procedure denotes a “situation in which, in the opinion of a pilot or of the air traffic control personnel, the distance between aircraft moving under their own power as well as their relative positions are such that the safety of the aircraft involved could be endangered in flight or on the ground in the aircraft manoeuvring area” (ICAO, doc. 4444-RAC/501).

The French airprox processing procedure includes several steps:

After notification of an air traffic incident, by an initial message and/or report, an investigation by the Local Civil Aviation Authorities leads to the opening of an initial dossier.

Within the three month period after the filing of the airprox, the local commission

for service quality/safety meets to analyse the incident and propose their conclusions with a list of causes and the measures liable to avoid a recurrence. It completes the dossier which is then transmitted to the National Airprox Bureau (BNA).

The BNA completes the incident analysis and produces a summary.

The National Commission for Air Traffic Safety closes the dossier. The mission of this body is to define and propose all measures appropriate to prevent recurrence of air traffic incidents and to reinforce air traffic safety.

On 25 May 2000, processing of the 6 October 1998 and 17 May 1999 airproxes had not been completed. CNSCA examination of the first of these events took place on 20 May 2000 and the corresponding report was produced on 22 June 2000. The file concerning the second incident had not yet been transmitted to the BNA.

1.17.3.2 Organisation of Feedback at ADP

Feedback at Aéroports de Paris is now organised at several levels:

1 - Closest to the controllers, the Service Quality and Environment subdivisions (QS) receive incident information from the controllers and pilot reports (e.g. Air France ASRs). They study events and collect the necessary additional information. The QS subdivisions have a correspondent in each of the control teams. For any incident deemed significant, an information message is distributed within the next fifteen days to all controllers. In February 2000, the QS subdivision started to distribute a periodic publication at Paris Charles de Gaulle which presents in detail some of the events in order to pass on information related to safety.

2 - For events which do not lead to filing an Airprox, controllers may now fill in (anonymously if they wish) a feedback form when they deem the event has jeopardised safety. This form is also analysed by the QS subdivision. This incident reporting procedure was first used in October 2000, but it is seldom used.

3 - The Prevention and Safety Group (GPS) meets on a monthly basis under the responsibility of the ADP prevention official representative. This group was created on entry into service of the South parallel runways in March 1999 to monitor the changes involved and examine related problems. Due to the success of this experiment, its activities were extended to the whole aerodrome at the end of 1999. The GPS is made up of representatives from:

- the Service Quality subdivision,
- the different ADP services,
- specialist controllers and pilots,
- the Air France prevention and safety service (Air France is by far the major aerodrome user. This operator also maintains a feedback system).

The GPS defines a risk prevention and management policy. It analyses all significant events and keeps a chart with different indicators so as to identify recurring problems. It draws conclusions from the events, proposes action and

monitors performance.

4 - At the highest level, there is the Risk Prevention and Management Steering Committee, chaired by the Air Operations Director. This Committee works on the basis of the analyses performed by the GPS, and validates its general policy direction.

1.17.4 Measures taken by ADP following the Airprox of 6 October 1998

At the request of the investigators, ADP made available information on the measures taken following the Airprox of 6 October 1998. These measures had been defined taking into account the opening of the South parallel runway (2 March 1999); they were not modified after the Airprox of 17 May 1999:

- Development of pilots and controllers' awareness of the parallel runway characteristics and the specific management of runway crossing, via the production of a widely distributed video.
- Creation of the Prevention and Safety Group (GPS) (see paragraph 1.17.3.2).
- Acquisition of a high performance runway control simulator providing 360° viewing capability, and implementation of an intensive training programme for the controllers.
- Transfer of South LOC position to the South Tower for improved visibility.
- Installation of a second “ASTRE 2000” ground radar in the South Tower, to supplement the radar already installed in the North Tower.

1.18 Additional information

1.18.1 Comparison with other large European Aerodromes

The investigators examined information regarding the organisation and methods applied at three European platforms that have volumes of traffic comparable to that of Paris Charles de Gaulle, with special attention to the following points:

- manning of Tower,
- radio messages,
- rules for taxiing and line-up instructions (line-ups from DGV, multiple line-ups),
- prerogatives of local controller,
- Ground – local controller co-ordination,
- particular equipment at holding points,
- role of Tower Manager.

They noted the following differences from Paris Charles de Gaulle aerodrome and the national French regulations:

Frankfurt Aerodrome (Germany)

- Manning of Tower: there are four tower controllers during the day and three at night: the Tower manager, the delivery controller and one or two local controllers (when the two are present, one is in charge of the parallel runways and the other of runway 18). The co-ordinator (Tower manager) does not handle a frequency.
- Language: all communications are in English.

- Line-up: there are no line-ups from DGV's, only from taxiways perpendicular (or practically perpendicular) to the runways.

Amsterdam Aerodrome (Netherlands)

- Phraseology applied: irrespective of the aircraft entry point on the runway, the conditional statement *"behind + aircraft type"* is used.
- Language: all communications are in English.
- Assistance: the local controller may be assisted, but only by a qualified controller.
- Controllable stop bars: red and green lights are used to prevent incursions, but only for parallel runway crossings. A system based on radar and ground sensors is being installed. Its purpose is to alert the controller whenever there is a risk of simultaneous presence of several aircraft on the runway.

London Heathrow Aerodrome (United Kingdom)

- Conditional clearances: each clearance to line up behind an aircraft is systematically accompanied by a conditional statement, irrespective of traffic load:
  Extract from Air Traffic Services Manual*: Conditional Clearances shall not be used for movements affecting the active runway except when the aircraft or vehicles concerned can be seen by both controller and pilot or driver. Conditional clearances are to relate to one movement only and, in case of landing traffic, this must be the first aircraft on approach. However, when a number of aircraft are at a holding point adjacent to a runway then a conditional clearance may be given to an aircraft in respect of another that is ahead in the departure sequence. In both cases no ambiguity must exist as to the identity of the aircraft concerned.*
- Multiple line-ups: there is a specific national procedure concerning line-ups involving more than one aircraft at several points on the runway, while in France this is covered by local procedures. This practice is only possible:
  - in daylight,
  - if all aircraft can be seen permanently by the local controller,
  - if all aircraft are on the same frequency,
  - if the pilots are informed of the number of aircraft lined up ahead of them in the sequence and the place from which each aircraft will take off,
  - if the physical runway characteristics enable each aircraft to see the aircraft lined up ahead of it.
- Ground-local controller co-ordination: in the United Kingdom, co-ordination of strip transmission is mandatory in case of take off from an intermediate access taxiway. It can be non-verbal, in particular with lighting systems.
- Assistance: a person duly qualified for this post can serve as assistant to a controller.

1.18.2 Testimony

1.18.2.1 SOL Controller

The Ground controller was working with headphones. The tower environment was quiet and normal. No particular problem was detected by the team members. The head of ATC was helping in the task of transferring strips between the SOL and

LOC positions.

The MD 83 experienced a technical problem on taxiway B2. The controller then diverted it to taxiway 18 and transferred it to LOC after filling in the strip. The aircraft reached taxiway Q and LOC transferred it back again. The aircraft position lead to the allocation of runway 26R with departure 8B. He updated the strip.

After solving the problem, the crew asked to make a 180° turn on the taxiway. The controller directed the turn on the secondary lane of taxiway Q, then transferred it to the LOC frequency.

He then asked the Shorts, which was taxiing from the freight zone, if they wished to take off from an intersection. The crew asked for taxiway 16. The controller does not like to allocate this taxiway but, since the crew asked for it and there were other aircraft being pushed back, he granted clearance. He then transferred it to the LOC frequency, after indicating 16 on the strip.

When he passed the strip on to his colleague, he did not mention verbally that the Shorts would take off from taxiway 16.

He then proceeded to deal with the rest of his traffic. When he heard the LOC controller announce there was an aborted take off, it did not strike him as abnormal bearing in mind the problems experienced by the MD 83. He then heard that the two aircraft had collided and that radio contact with the Shorts had been lost. He heard the red alert being activated.

1.18.2.2 The LOC controller

On the day of the accident, the LOC controller was on his sixth training day. He had started duty at 18 h 00 and was due to finish at 5 h 00. His duty shift was due to end at 1 h 30. He was therefore at the end of his control period at the time of the event. He was working with headphones.

The aerodrome had operated with the two towers during the day, then control had been grouped in the North Tower. Work on taxiways 17 and 17.1 caused access problems to holding point 27. On the ASTRE radar screen (situated on the right-hand side on the combined station) there were many fixed and mobile plots within and around the work area, with a lot of garbling also on the whole image. The AVISO screen was not accessible due to its distant location, bearing in mind that only the SOL positions are equipped therewith.

Direct visibility was difficult since there was a lot of light pollution due to the works. Visual monitoring of an aircraft in this context was impossible, except by “tracking” (i.e. without losing sight of it).

There was no tension in the control team, nor apparent stress due to the work load. There had simply been some excitement which was disappearing, due to the unusual activity of the night and the unusual presence of additional personnel, controllers and managerial staff.

The controller was no more tired than usual. He had had a few breaks during his duty, including one for a meal. During the night, and at the time of the event, the head of ATC was between the SOL and LOC stations to help transfer the strips. This posed no problem to him a priori.

He thought that, over a short period of time, a feeling of routine developed. This created a mental picture in which, due to the work site, all aircraft went via taxiway B. In his mind, all aircraft took off from the threshold. As mentioned above, it was difficult, not to say impossible, to have the exact location of each aircraft.

The MD 83 arrived at holding point 27. The crew experienced technical problems and informed the LOC controller of the situation, stating that they would try to solve them. At that time, the aircraft was barring access to runway threshold 27 where other aircraft were expected. The controller heard the SOL controller and the Head of ATC say that it would be simpler, to vacate access to the holding point, for the MD 83 to contact SOL again and taxi to another taxiway. Since this manoeuvre had to be negotiated with the SOL controller, he transferred the aircraft to this frequency. He then heard the SOL controller and the head of ATC say that, to avoid a 180°, a manoeuvre deemed risky (reference to a recent incident), it was preferable to have the MD 83 take taxiway Q, then taxi to holding point 26R.

Since the MD 83's problems appeared to be solved, it was transferred back to monitoring the frequency. At that moment, everything appeared to indicate that the MD 83 was standing at runway holding point 26R.

During this whole traffic sequence, the head of ATC helped by passing him the strips of the aircraft transferred by the SOL controller.

The controller remembers the details recorded on the MD 83 strip: the figures 27 printed and 26R hand-written in the placed reserved for QFU information, the indications 8A and 8B in the place reserved for departure, one of the figures 27 or 8A crossed out. The combination 26R/8B did not appear muddled.

For this reason, he granted departure 8B to the MD 83. He was informed that it was waiting at holding point 27. He then indicated that he would have liked to see the precise information recorded on the strip unambiguously, and the wrong information crossed out unambiguously also.

After lifting any doubt with the crew, he confirmed departure 8A from 27. He updated the strip accordingly. The crew read back correctly.

He remembers he cleared the MD 83 for line up. He does not remember whether or not the line-up was conditional on the arrival of another aircraft. He thought he would line up the Shorts in sequence, which he did, taking care to ask it to wait and allocating it number two for take off.

He heard a noise similar to that of a thrust reversal. He was surprised to hear it and, after looking at the ASTRE screen and seeing the MD 83 plot, he realised the aircraft had aborted its take off. He asked the crew if they needed assistance or emergency services. They announced they had collided with another aircraft. For

him, this was impossible and he asked the MD 83 to confirm the collision and possible damage. He requested that the Tower Manager sound the alarm. He still had not realised that the Shorts could be the cause of the conflict.

When he realised it, a moment later, he asked the Shorts if they were receiving him and obtained no answer. Meanwhile, the Tower manager had sounded the red alert. The LOC controller was replaced shortly after.

There were no departures from taxiway 16 the whole night and, due to the works, for him all departures took place from taxiway B leading to threshold 27. There was no verbal co-ordination with the SOL controller when transferring the strip to point out the Shorts departure from taxiway 16 or, in any case, if there was, he did not hear it.

The organisation of his strips was quite conventional. He had laid out the five strips he had in two columns, in take off sequence: four for runway 27 and one for runway 26R, i.e. one column per runway. He had not referred to the taxiway information on the strips since, in his mind, there was only one access possible to threshold 27. This technique of selective access to information is normal in a work environment where it is only necessary to retain pertinent information.

Additional testimony

After reading the preliminary report, the controller wished to give additional information on certain issues:

- The head of ATC, while passing the strips to him, placed them on his control board. The strips were not presented to him on the side of the board, nor offset from the board, as is normally done to enable the controller to integrate them after analysis and detect possible conflicts. The head of ATC integrated the strips directly on his control board, suggesting therefore the departure sequence of the aircraft transferred and by-passing the analysis and conflict detection step.

- Since his attention had to be focused on different sources of information at the same time, it was not possible for him to check at all times and, therefore, for each aircraft, all movements integrated onto his control board, including those integrated without his knowledge.

- “Astre” was not functioning correctly. The only visible echo attributable to aircraft in probable waiting positions on runway 27 could be seen at the runway 27 threshold. Radar operation was therefore not at all satisfactory, though no doubt was cast on the information displayed.

- He heard about the Airprox of 6 October 1988 only a few days before the preliminary BEA report, and was therefore not informed of it before taking up duty at Paris Charles de Gaulle control positions.

1.18.2.3 The Tower Manager

Note: the times given below are local.

On the day of the accident, the Tower manager had started his shift at 20 h 00. He was due to finish at 3 h 30.

Due to the exceptional nature of the night, there were two teams of controllers: the IFR room team and the tower team. The traffic in the IFR room had been heavy until 2 h 30. Around 2 h 30, there was a grouping of the IFR room with a tower approach/departure position, basically because there were no more arrivals. The policy adopted consisted in having all flights to Madrid leave from 27 (westbound departures) and all flights to Valence from 26 (Southbound departures).

At the time of the accident, he had occupied the delivery position for the previous ten minutes approximately, without headphones. The controller team had been in place for the previous ten to twenty minutes.

He remembers that Air Liberté had technical problems while taxiing to the threshold and, more particularly, that the aircraft went to taxiway Q. For him, the controller offered taxiway 16 to Streamline.

The atmosphere was normal and there was no apparent stress.

He heard the LOC controller speak of an aborted takeoff and state that the pilot had collided with something. The controller told him that he no longer had the aircraft on his frequency.

He called the RFFS and sounded the red alert. He sent the message to guide the RFFS vehicles to taxiway 16. After co-ordination with the LOC controller, they were guided to DGV 10 where the Streamline was located. He remembers a second RFFS vehicle followed the MD 83 to the parking area in case there was a kerosene leak.

As soon as the RFFS was informed, he called the standby team. The LOC controller only had two aircraft and was relieved immediately.

1.18.2.4 Head of ATC

The head of ATC had spent the days preceding the accident organising the management of the additional traffic caused by the Champions League final. More particularly, it had been decided to set up a special operations centre. One person was permanently responsible for maintaining physical links between the control tower and the special operations centre to ensure better communication of the information on the special flights, and avoid overload for the tower and the approach room, more particularly in terms of telephone calls. He had taken over this role from 23 h 30 on the night of the accident. That was why he was in the tower when the accident occurred.

He did not notice any specific verbal communication during the event. He helped to transfer the strips between the SOL and LOC controllers, from hand to hand. He cannot certify whether or not he handled the strips of the two aircraft concerned. In fact, he was getting ready to return to the special operations centre and was

standing near the delivery position, looking out towards the foot of the North tower where a DC 10 and a B 737 were standing.

1.18.2.5 Management of Instructors at ENAC

The managerial staff dealing with instructors at ENAC never noticed any particular problems concerning qualification maintenance. More particularly, they had no feedback about problems of stress or the feeling of having experienced any difficulties.

Moreover, they never noticed particular apprehension from an instructor before his control period. On the contrary, periods of qualification maintenance are looked upon favourably in general.

There is no real difference between an instructor on qualification maintenance and a controller resuming his activity after a long holiday period or sick leave, or even a controller working in a subdivision. In all cases, the assignment of control positions is decided by the centre, depending on individual abilities. In addition, they never had a case of a controller unable to maintain his qualification, nor remarks from the centres, including Paris Charles de Gaulle, concerning the abilities of the instructor controllers.

Occasionally, however, the centres showed some reluctance to include instructor controllers in their scheduling. Instructors undergoing qualification maintenance generally generate additional workload for the instruction divisions of the centres. Instructors have also complained on some occasions of not being considered as an integral part of the team.

The precise rules concerning re-qualification methods are defined by the centres and may differ from place to place.

1.18.2.6 The crew of the MD 83

The crew of the MD 83 arrived at Air Liberté operations in Orly at 19 h 30. The flight started with positioning at Roissy, from 21 h 15 to 21 h 55. The landing took place on runway 27 and the aircraft taxied toward stand Y4 (terminal 1).

There was a problem during boarding as there were too many passengers. The ADP co-ordinator wished to board passengers having no Air Liberté boarding card. Most of the passengers booked on Air Liberté were late. The First Officer supervised the boarding operation and organised card checking. The delay did not worry the crew since it was a charter flight due to return to Orly without passengers in the morning.

Start-up was requested. The ramp technicians asked the crew if the “aircraft was autonomous”. Thinking they were referring to the electrical power supply, the First Officer confirmed (the auxiliary power unit was running). In fact, the question was whether the aircraft could depart from stand Y4 without push back, which was impossible. After explaining, a push back was requested. Since the tug had a hydraulic problem, the push back was performed in reverse, which caused an

additional delay of five to ten minutes.

Taxiing began at 0 h 05 hours. The Captain was the pilot flying. During the taxi checklist, a flag was detected on the RAT indicator of the automatic throttle thrust computer. Since it was possible to continue with the flight, taxiing continued to holding point 27, at which time the MD 83 was transferred to LOC frequency.

Since dealing with the failure required further checks in the documentation, the First Officer asked the controller for permission to wait at the holding point for a few minutes. He was then asked to vacate the access to the runway, then was transferred to the SOL frequency and directed to taxiway Q. After consulting the documentation, he asked to return to holding point 27. The controller offered take off from 26. Since the crew wished to remain in their initial configuration (briefing and cockpit preparation made for runway 27 with departure AIGLE 8A), they were directed to the secondary lane of taxiway Q so as to turn back towards holding point 27.

While approaching the holding point, the crew received clearance for a departure AIGLE 8B corresponding to a take off from runway 26R. They noted the error and asked the controller to confirm. The controller confirmed AIGLE 8B. At the third exchange, the controller confirmed departure AIGLE 8A initially allocated by the delivery controller.

The crew was transferred again to LOC frequency. The controller gave them permission to line up and hold position after the landing of a B 737. They lined up behind and held position at the threshold of runway 27, then were cleared for take off. The First Officer selected full power on brakes manually.

After passing the “bump” (runway surface) and the V1 announcement by the First Officer, three to four seconds before the impact, the Captain saw an aircraft stopped on a taxiway near the runway, approximately two hundred to three hundred metres ahead of them. Immediately after, since the aircraft appeared to be moving, he prepared to abort the take off in case of contact. While approaching VR, the Captain saw the Shorts move forward from the left and heard the noise of its engines.

Bearing in mind the risk of collision, the rotation was not performed. The shock occurred instantaneously, without significant change to the aircraft’s track. The Captain immediately aborted take off, in accordance with the applicable procedures.

No asymmetry appeared during deceleration. After controlling the speed, the First Officer reported to the tower they had just collided with an aircraft. Since the controller found this hard to believe, the First Officer specified the aircraft type and requested the emergency services.

After vacating the runway and confirmation of the damage by the senior flight attendant, the crew decided not to evacuate the passengers using the escape slides so as to avoid any further trauma.

The aircraft, escorted by safety vehicles, was first directed to area Y, then, on request of the First Officer, to area R. When this area was in sight, with the agreement of the Captain and after taking all necessary steps, the First Officer went into the passenger cabin to check damage and reassure the passengers.

After returning to the cockpit and while approaching stand R14, the crew smelt a strong odour of fuel, which led the Captain to stop the left engine which had by then become useless due to a suspected leak in the left wing.

Once the aircraft had come to a halt, passenger disembarkation proceeded smoothly in the presence of the safety services and the Captain. The crew, who had to cut off the CVR from memory, experienced some difficulties in identifying and locating the circuit breaker.

Additional information from the Captain

When taxiing down taxiway B towards holding point 27, the Captain noticed beacon lights on his left, among which he thinks, in retrospect, he saw rotating lights and/or flashing lights.

When lining up runway 27, he felt, maybe due to the lights on his left, that there were some aircraft behind his.

After receiving permission to take off, he heard messages transmitted in English which, for him, could only be addressed to the aircraft situated behind him. This information therefore did not cause him to modify his course of action.

When he discovered the presence of the Shorts, it seemed to him that the aircraft was at 90° to the runway centreline, stopped and at an adequate distance from the runway. He thought it must have been an aircraft that was still on the ground frequency.

Additional information from the First Officer

During power-up at take off, the First Officer's attention was not drawn by the message relating to the Shorts, due to the presence of other aircraft behind the MD 83.

During taxiing for take off, his attention was focused on the engine parameters and speeds. He held the control column in supervisory override mode, in accordance with airline procedures.

He immediately recognised the type of aircraft they had collided with.

During the aborted take off, he seconded the Captain's actions in accordance with normal procedures.

1.18.2.7 The Captain of the Shorts

N.B: The times given are London times (UTC +1).

The crew had made a rotation to Paris Charles de Gaulle the previous night. The Captain had gone home at 5 h 00, on the morning of 24 May 2000. He had slept until 13 h 00 and had left home at 18 h 30 to arrive at Luton aerodrome at 19 h 45. The flight to Paris Charles de Gaulle had gone smoothly.

Before departure of the return flight, the Captain went round the aircraft and checked all of the lights for correct operation. Seated in the left seat, he was pilot flying on this leg and in charge of aircraft taxiing. It was the first time his fellow crew member had to perform the First Officer's duties completely.

First of all, they taxied to the holding point of threshold 27. The Captain feels they asked to depart from the intersection of taxiway 16. At that time, he knew there was an aircraft taxiing ahead of them, which appeared to have gone too far on taxiway Q.

He stopped the aircraft at the holding point of taxiway 16. They were then transferred to tower listening frequency. He heard a message in French which he did not understand, the instruction in English concerning them "line up and wait, you are number two". He began to move forward immediately. He thought then that "number one" was the aircraft which had just passed in front of them on the runway at a rather high speed. While they were moving forward, he noticed the aircraft which had just passed was slowing down and leaving the runway. He leaned over to look right. He saw the lights of an aircraft taxiing on the runway. He applied the foot brakes immediately and his aircraft stopped. He realised there was nothing he could do to vacate the runway.

The shock threw him to the left and his feet left the pedals. It appeared to him that the aircraft was being pushed forward and maybe to the right. It appeared to him that the right engine stopped and the left one was still running. He pushed away the body of the First Officer, which had fallen onto him, and attempted to move the aircraft off the runway while lighting the control panel above him with his torch. After this, he tried to stop the engines, for which he had use the fuel shut-off levers. He saw the rescue services approaching and tried to warn them, with the red filter of his torch, that the propellers were rotating. He was then evacuated from aircraft.

2 - ANALYSIS

2.1 Scenario

The following scenario emerges from the facts established in the course of the investigation. A certain number of points are raised which are subsequently analysed.

2.1.1 Background

On the evening of 25 May 2000, the context at Paris Charles de Gaulle aerodrome resulted from:

standard arrangements:

- the night ATC team is on duty in the north tower,
- Streamline Aviation twin turboprops usually take off from a runway intersection.

and characteristics specific to the night of 24/25 May 2000:

- there was extra activity as a result of a large number of flights to Spain,
- works near runway 27 led to the closure of several taxiways,
- there was a lot of lighting in the works area and movements by worksite vehicles,
- the LOC position was occupied by a controller, an ENAC instructor, who was refamiliarising himself with the Paris Charles de Gaulle working environment.

2.1.2 Sequence of Events

The context had created, for the LOC controller, an erroneous perception of the situation at the aerodrome[3], according to which all aircraft having to take off from runway 27 were directed towards the runway threshold. As he had not noticed the indication of the taxiway on the strip and nothing had drawn his attention to the peculiarities of the Shorts' situation, for him this aircraft was taxiing behind the MD 83.

Nothing subsequently disturbed this false mental picture:

- a direct visual check was difficult to perform because of the works and the light pollution and radar verification was difficult because of the screen's characteristics. In addition, bearing in mind his mental picture of the situation, there was no reason for his attention to be drawn to taxiway 16,

- radio communications with the Shorts: there was no identification of position

[3] The same type of erroneous mental picture occurred during the airprox on 17 May 1999.

on the LOC frequency.

The controller instructed the MD 83 to line up on runway 27 behind a B 737 which was landing. The B 737 left the runway via taxiway 10, passing in front of the Shorts.

At this stage, the controller had a mental picture of the Shorts at the holding point of the threshold to runway 27. He thus authorised the MD 83 to take off and, in the same sequence, he gave the Shorts clearance to line up, with the instruction "*line up runway two seven and wait, number two* ". This instruction, incorrect since the Shorts was on taxiway 16, corresponded to the controller's perception of the situation.

The crew of the Shorts hadn't understood the takeoff clearance given in French to the MD 83. Because of the very sharp angle between the taxiway and the runway, they could not see the beginning of the runway, which was behind them while they were taxiing on taxiway 16. Reception of the line-up clearance caused an immediate reaction and they began to taxi towards the runway whilst wondering about the identity of the "number 1" aircraft.

For their part, the crew of the MD 83 could understand the line-up clearance given to the Shorts but the form used made it impossible for them to know that this aircraft was going to line up in front of them. In addition, at power up and during the beginning of acceleration, there was no obstacle in front of them.

Visual contact between the aircraft was established very late in a situation where an avoidance manoeuvre was no longer feasible.

2.2 ATC Service

2.2.1 Origin of the LOC Controller's Erroneous Perception

It is difficult to identify and weigh up with any certainty all of the causes of a human error. The following elements may, however, be offered up to help interpret the error committed by the LOC controller regarding the position of the Shorts:

- as he stated in his testimony, the controller had formed a picture of the situation based on a false hypothesis: the fact that, because of the works, taxiways 16 and 17 would not be in use. For him, departures were to take place from the runway threshold,

- this erroneous perception was facilitated by the absence of a tower team briefing which would, amongst other things, have led to a unified picture of the use of the platform in the minds of the controllers,

- from the beginning of the tour of duty right up until the accident, the controller had not had to control an aircraft using an intermediate access taxiway, which reinforced the false picture he had made of the situation,

- the lack of co-ordination during allocation of taxiway 16 to the Shorts did not

change this picture,

- for a relatively long period of time, the controllers' attention was focused on the MD 83, that's to say on the aircraft which was experiencing problems,

- according to the logic of his perception of the situation, the controller did not ask himself any questions about the takeoff sequence. This may explain why he didn't read the strips systematically at the same time as the handovers,

- the MD 83's strip was written over and contained some incoherence, which contributed to distracting his attention from the Shorts strip as well as other sources of information.

2.2.2 Use of Means to Check on the Position of the Shorts

The LOC controller's error of perception could usually have been corrected by recourse to one of the sources of information relative to position which he had at his disposal:

- the indication of the access taxiway featured on the strip as a circled number 16,
- a visual check,
- a radar check,
- the radio.

Even though these resources are commonly used when controlling at an aerodrome, he did not take advantage of them.

- The strip was passed on to him in a banal fashion and, as we saw above, the MD 83 and its strip were drawing his attention.

- Visual surveillance of the manoeuvring area around the threshold of runway 27 was very difficult to perform. It was dark, the rain had made the ground reflective and the lighted area of the work-site was located between the north tower and threshold 27. Furthermore, bearing in mind his mental picture of the situation and his failure to take into account the information on the strip, he had no reason to focus his attention on taxiway 16.

- AVISO imagery was not displayed at his position. With regard to ASTRE imagery, it was poorly positioned for him and its quality would have required concentrated reading, especially as the worksite vehicles moving in the works area generated parasite plots. Moreover, to obtain interesting information it would have been necessary for him to focus his attention on taxiway 16 to search for a plot, which would suppose previous knowledge of the presence of an aircraft in this location.

- Confirmation of position by radio communication is only used when a controller has doubts as to the position of an aircraft, which was not the case. In addition, the Shorts having been transferred to tower monitoring,

they did not broadcast a position message on the LOC frequency. Further, the applicable methodology does not require specifying the taxiway used in the line-up instruction.

Overall, information relative to position was available but difficult to use in practice. The significance of this information was completely eclipsed.

2.2.3 ATC Working Methods

Some factors related to working methods contributed to creating this situation and to maintaining the controller's erroneous perception. Taking into account each person's perception of the situation, analysis of the working methods put into practice on the night of the accident does not reveal any significant divergence relative to control methods, whether general or particular, in use at the platform.

Thus, the terminology used, which is in accordance with that described in the manuals noted in paragraph 1.17.1.3, shows some weaknesses concerning management of departures from intermediate taxiways.

2.2.3.1 Operations Manual

The operational framework, the functions and tasks of each participant as well as the procedures specific to the aerodrome should logically be defined in the tower Operations Manual. However, this document has no well-defined regulatory role, it was not updated regularly and, as we have seen, internal memos were used in parallel.

This poses a basic question as to the coherence of working methods since the standard reference document does not, in practice, fulfill its role and the unorganised mass of internal memos cannot satisfactorily complete or replace it.

It can thus be seen that this situation did not help in keeping the controllers' knowledge up to date, in particular for those who return to duty after a significant absence. Equally, the absence of a single structured work of reference does not facilitate, in the context of feedback, the rigorous comparison of facts and regulations and the possible evolution of the latter.

2.2.3.2 Role of the Tower Manager

The main role of the tower manager is to supervise the control team. Logically, this implies carrying out a briefing before starting operations. This practice improves coherent action within the team and ensures that the controllers have full knowledge of the specific details pertinent to that day. However, such a briefing is not specified in the procedures for Paris Charles de Gaulle and, as a result, is not in use.

Furthermore, in order to completely fulfill his role in team supervision, the tower manager must be able to adequately free himself from operational tasks implied in the possible parallel holding of a controller position.

2.2.3.3 Role of the Ground (SOL) Controller

The choice of a departure from an intermediate taxiway is usually made when the aircraft is on the SOL frequency. The clearance given to taxi does not specifically mention the holding point which the aircraft has to use. In a case where there are several holding points, a degree of imprecision thus exists. For example, it was this imprecision which led to the 1998 airprox.

Similarly, it was noted in paragraph 1.17.1.3 that the SOL controller must co-ordinate with the LOC controller at the time of the allocation of an intermediate taxiway. The nature of this co-ordination and the form thereof are not specified. Such co-ordination did not occur on the night of the accident.

Likewise, the absence of verbal information during handover of the Shorts' strip between the SOL and LOC controllers did not alert the latter to the specific characteristics of this departure from taxiway 16. This non-mandatory information does not seem to be usual at Paris Charles de Gaulle, mainly because of the frequency of multiple line-ups from intermediate taxiways and the controllers' workload during busy periods. The number of the taxiway is simply circled on the strip, the LOC controller then being responsible for organising the line-ups.

2.2.3.4 Role of the LOC Controller

The LOC controller's role is to manage the runways for takeoffs and landings. His position in the tower cab is clearly justified by the necessity for visual verification, the basis of aerodrome control. However, this direct verification can be rendered difficult, even impossible, for various reasons at large aerodromes. This is why other means are made available to the controller to allow him to confirm the position of aircraft.

Nevertheless, there is no systematic procedure for the use of these means, including for example checking their condition or defining their role in the controller's actions. At the same time, there are no procedures or systematic practices (equivalent for example to checklists for pilots) which validate control actions, with the exception of readback.

As we have seen, the LOC controller did not have recourse to these means on the night of the accident. In fact, numerous items of information are presented to controllers and, in the absence of procedures, they must organise priorities and make choices step by step. This often leads them to create a simplified mental picture allowing them to select information regarded as important. In fact, as soon as a mental picture is formed, consciously or unconsciously, some information has a less significant status, such as for example information on the taxiway or radar plots.

The major problem in such a situation is that this overall picture of operations and the nature of checks carried out by the controller, which are not usually stated explicitly, remain unverifiable. Only a subsequent error, for example an incorrect clearance, may possibly be identified. One solution may lie in interaction with another person, a qualified assistant or a controller in another position.

It also appears that the terminology employed for line-up instructions is no guarantee against a false mental picture. As for ground control, the line-up instruction does not systematically mention the identification of the taxiway from which the line-up will take place, which would for example warn the crew in case their real position was not in accordance with the instruction given by the controller.

After having lined up the MD 83 and the Shorts, the controller lined up a third aircraft in sequence, which confirms what his perception of the situation was. We have seen that this practice, widespread at aerodromes with a high volume of traffic, is not defined in any way in the works of reference. Such a clearance to line up in sequence, which can even be given when the aircraft is not yet at the holding point, would tend to reduce the controller's vigilance, since management of entry onto the runway is then handled by the aircrew.

2.2.3.5 Role of the "Assistant"

We have seen that, on the night of the accident, the head of ATC was present in the tower and that he had helped the controllers by passing on the strips. This type of help is apparently common practice at Paris Charles de Gaulle. His role is not, however, defined even though in fact modifies the control team's functions.

Thus, the controller supported in this way may have felt implicitly relieved of one part of his task of organising departures. Through the lack of direct contact with the SOL controller during strip transfers and perhaps as a result of a lack of continuity during handling of the strips, he also missed opportunities to realise the true situation of the Shorts. On the other hand, it is likely that organised input from a third party could enable improved co-ordination in particular cases and in the handling of unexpected events. It is thus not the intervention by a third party in itself which creates a problem but rather the lack of a clear definition of roles and prerogatives for each participant.

2.2.3.6 Teamwork

The investigation brought to light failings in the application of teamwork (lack of briefing, co-ordination of controllers, third party intervention) which resulted in a poor usage of the available resources. We also saw that the LOC controller had no knowledge of the airproxes of 6 October 1998 and 17 May 1999. We also note that none of those present in the tower seemed to have improved their awareness as a result of these two events, or at least not sufficiently to realise that a situation of such a type was recurring at that moment in time.

It is known that facts established in similar situations for aircrews led to the establishment of systematic training programmes in teamwork. In a similar way, setting up training in resource management for control teams would tend to reinforce controllers' awareness and knowledge in this field and to benefit from feedback for training purposes.

2.2.4 Procedure for Controllers Return to Active Service

The preceeding analysis has shown that the failings brought to light are linked to working methods and systems in place at Paris Charles de Gaulle, as well as to the specific sequence of takeoff management on that particular night, rather than to a problem of competence.

However, due to the particular status of the LOC controller as an instructor, the investigators examined the procedure used to return controllers for work at the Paris Charles de Gaulle platform. They were able to determine that there was a difference in the treatment of ICA's (instructor controllers), who are never evaluated and for whom no return to work procedure exists, and other controllers returning from a prolonged period of absence.

ICA's are basically expected to familiarise themselves with memos and instructions issued during their absence, although they have not followed the evolution of the platform from day to day.

Even considering the fact that instructors, in their duties, do not stray far away from the context of ATC during their absences, the time allowed for this update seems inadequate, bearing in mind the rapid evolution of platforms and the large number of internal memos related to ATC practices.

It is equally surprising that self-assessment is often sufficient in practice for a controller to be considered fit to return to a position safely. It is known that self-assessment is not an objective measure. Amongst other things, it may allow the controller to overlook a weakness, for example if this results from lack of knowledge rather than lack of training. Self-assessment does not represent a true safeguard. In this context, it is notable that aircrew are subject to formal procedures before being released for duty or returned to duty, even though they are also systematically subjected to regular checks.

2.3 Crew Perception and Situational Awareness

As a last resort, crew awareness of the presence of the other aircraft could have helped avoid the collision. Various factors affecting perception made this awareness impossible.

2.3.1 Visual Perception

2.3.1.1 MD 83 Crew

The MD 83 lined up behind the B 737 on final approach. Lined up on the runway, the crew were able to see it taxi after landing and exit the runway. At the same time, they were preparing the aircraft and performing the pre-takeoff checks; taking into account the malfunction on the autothrottle, their workload had increased.

During this time, the Shorts was stationary at the holding point about one thousand

metres away, slightly to the left with, between the two aircraft, the marked and lit-up worksite. Observations made on the spot showed that there was no physical object or raised ground between threshold 27 and taxiway 16. However, the dark, the wet ground and the lighting pollution in the area made it difficult to spot the Shorts. Furthermore, the lighting from terminal 1, in the background, reduced the contrast from the aircraft's lights.

The Shorts was difficult to identify in this environment for a crew who had no reason to look for it.

After power-up, the crew were too busy to pay attention to the environment outside of the takeoff path. Therefore, they only noticed the Shorts when it was on the runway.

2.3.1.2 Shorts Crew

Before lining up it is usual for a pilot to perform a visual check to ensure the absence of any traffic on final or on the runway. However, taking into account the vision angles and the orientation of taxiway 16, the crew of the Shorts could not at any time have been in visual contact with the aircraft taking off. They could only have seen it after a right turn of at least 60°. Because of this, they could not check for the absence of aircraft before entering the runway. While looking for aircraft "number one", they nevertheless tried to carry out a final check, but this was done when they were on the runway, and was thus too late.

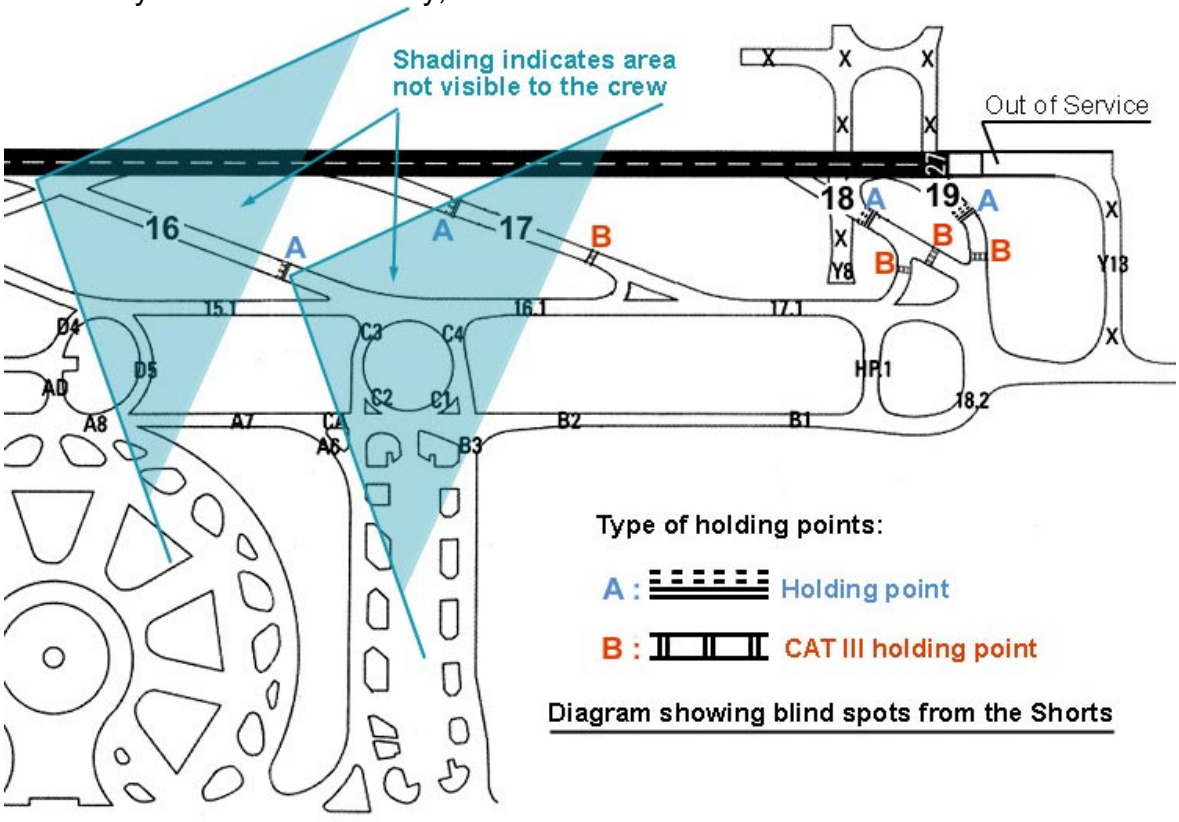


Diagram showing blind spots from the Shorts

Lining up from a high speed exit does not allow a crew to observe the upper end of the runway. Since they cannot, as a result, note the possible presence of an

aircraft landing or on the takeoff roll, a safety factor is eliminated.

2.3.2 Perception of Radio exchanges

2.3.2.1 MD 83 Crew

When the Shorts was cleared to taxi to taxiway 16 by the ground controller (SOL), the MD 83 was on the same frequency. However, the crew had to deal with its technical problem at that time and did not analyse the information contained in a message which did not concern them. It is normal that they did not note the position of the other aircraft, nor that they did not remember it when they were lining up six minutes later.

The line-up clearance was given to the Shorts five seconds after the takeoff clearance was given to the MD 83. We have seen that at that moment the crew's workload was very high. So the message, containing as it did no reference to taxiway 16, could not have drawn their attention to the existence of the conflict situation, even less so since it implied the Shorts was located behind the MD 83.

2.3.2.2 Shorts Crew

The crew of the Shorts, who were not French-speaking, did not understand the MD 83's clearances to line up then take off. In addition, it was obvious to them that these messages were nor addressed to them.

The clearance they received, "*line up runway 27 and wait, number two* ", could have warned them. In their position, the expression *"number two"* could only mean *"number two"* for takeoff, which implied that there was an aircraft before them. We may note that the terminology used did not oblige them to identify the other aircraft formally, the "*number two* " in the second part of the message possessing an ambiguity as to whether it was information or a condition associated with the line-up clearance.

At first the crew believed that the B 737 was the ***"number one"***. When they realised that this aircraft had just landed, they were in doubt and looked for another aircraft, but this did not prevent them from entering the runway, especially as they were carrying out pre-line-up duties at the same time. It is clear that the first part of the clearance played a determining role in the situation.

2.4 Feedback

2.4.1 Analysis of Similar Events

In the course of the investigation, it was noted that runway incursions are relatively frequent: twenty in the first six months of 2000, four in September. Further examination reveals certain types of recurring events:

- aircraft cross the runway or go past a holding point,
- aircraft line up in front of an aircraft on takeoff or on final instead of lining up behind,

- there is a confusion in call-signs which leads to one aircraft moving other than that which the controller wished to call.

These events demonstrate that it is sometimes difficult for crews to situate where they are and arrive at a predetermined point. Holding points are not always identified. The terminology used is sometimes ambiguous when several call signs resemble each other and no positional information is given.

In particular, one aircraft lining up in front of another aircraft which is taking off is not exceptional, collisions being avoided because the crews notice each other in time. Being able to see is a crucial factor in saving the situation, this being absent in the case of the 25 May 2000 accident.

The 26 September 2000 case, where the controller was able to see an aircraft entering the runway and stop the takeoff under way, thanks to the AVISO system, confirms the interest of such a system for surveillance of the area around runways.

The 17 May 1999 airprox is equally interesting. There was a serious operational dysfunction and yet it did not ring any alarm bells in the system, or at least not quickly enough, and no further measures had been taken relative to those taken after the 6 October 1998 airprox.

2.4.2 Organisation of Treatment of Incidents

At the time of the accident, the feedback system put in place by ADP, in particular with a view to entry into service of parallel runways, was not completely operational or fully used.

In addition, better co-ordination between ADP and Streamline during treatment of the airprox would have helped prevent the repetition of such an event.

In comparison, the feedback system which exists within Air France allows a large number of events to be collated. This system has proved its effectiveness and crews do not hesitate to make use of it.

Furthermore, with the exception of the treatment of recorded airproxes at the national level (BNA and CNSCA), the investigation showed that no organised feedback exchange system exists between different French aerodromes, even less with foreign aerodromes. It is regrettable that the absence of such a system does not permit objective comparison of the advantages and disadvantages of the use of a single language, for example.

It is also noticeable that, in practice, the airprox procedure does not necessarily attract the attention of the operator of the aircraft not making a complaint in the event. Analysis of the event through feedback within the airline could, however, allow the airline to learn some lessons in advance of the official findings.

It is therefore notable that feedback culture is still new in the world of ATC, and is not yet completely integrated by everyone as one of the factors for the improvement of safety.

This rather underdeveloped feedback system, associated with a lack of established rules for teamwork, results in a non-optimal use of the information available.

3 - CONCLUSIONS

3.1 Findings

- The crews and the controllers possessed the appropriate valid certificates, licenses and qualifications.

- Both aircraft possessed valid airworthiness certificates.

- The controller in the LOC position, an instructor at the national civil aviation school (ENAC), was on a period of qualification maintenance.

- Paris Charles de Gaulle aerodrome had a larger volume of night traffic than usual. The north and south runways were in service and the ATC service was grouped in the north tower.

- The organisation of ATC services at Paris Charles de Gaulle is defined by an operations manual that is not updated regularly and by a large number of unorganised internal memos.

- Manning of the tower consisted of four persons. The tower manager was also handling the PREVOL position. The head of ATC was also present in the tower, and assisted in passing the strips between the SOL and LOC controllers.

- Work was being undertaken on taxiway 17 at the level of the threshold of runway 27. This caused significant light pollution near the threshold, the rain and the wet ground accentuating the phenomenon.

- The radar equipment was in service and was in working order.

- During the ATC team's shift, all of the aircraft taking off from runway 27 had lined up at the threshold holding point.

- Communications with the crew of the MD 83 were made in French, those with the crew of the Shorts in English.

- The Shorts was cleared by the ground controller (SOL) to taxi to the holding point located at the level of access taxiway 16.

- There was no co-ordination between the SOL and LOC controllers at the time the Shorts was allocated the taxiway 16 holding point.

- The number “16” had in fact been written on the strip for the Shorts.

- Before lining up, the MD 83 had encountered various problems that had delayed its departure and led to switchovers between the SOL and LOC frequencies.

- During the second handover to the LOC controller, the MD 83’s strip was scratched over and contained some incoherence.

- The Shorts’ strip was handed over in a banal manner, without any particular comment.

- In the mental picture of the situation at the aerodrome that the LOC controller had created, the Shorts was located behind the MD 83 at the threshold of runway 27. As a result, the controller was following a logic of line-ups in sequence, as confirmed by his use of terminology.

- In the reference terminology, line-up clearances do not mention the holding point from which the aircraft is to enter the runway.

- The LOC controller cleared the MD 83 to take off and immediately afterwards cleared the Shorts to line up, specifying that it was “number two”.

- The configuration of access taxiway 16 made it impossible for the crew of the Shorts to see the upper end of the runway at the time of the line-up.

- The crew of the Shorts did not realise that there was an aircraft taking off from the threshold. They entered the runway at the same time as they were trying to identify the “number one” aircraft.

- The crew of the MD 83 saw the Shorts late and, bearing in mind the speed reached, was unable to avoid a collision.

- The crew of the Shorts saw the MD 83 at the last moment.

3.2 Probable Causes

The accident was caused:

- Firstly, by the LOC controller’s erroneous perception of the position of the aircraft, this being reinforced by the context and the working methods, which led him to clear the Shorts to line up,

- Secondly, by the inadequacy of systematic verification procedures in ATC which made it impossible for the error to be corrected,

- Finally, by the Shorts’ crew not dispelling any doubts they had as to the position of the “number one” aircraft before entering the runway.

Contributory factors include:

- Light pollution in the area of runway 27, which made a direct view difficult for the LOC controller.

- Difficulty for the LOC controller in accessing radar information: the ASTRE image was difficult to read and the AVISO image not displayed at his control position.

- The use of two languages for radio communications, which meant that the Shorts crew were not conscious that the MD 83 was going to take off.

- The angle between access taxiway 16 and the runway which made it impossible for the Shorts crew to perform a visual check before entering the runway.

- The lack of co-ordination between the SOL and LOC controllers when managing the Shorts, exacerbated by the presence of a third party whose role was not defined.

- A feedback system which was recent and still underdeveloped.

OBSERVATIONS BY THE UNITED KINGDOM

The UK Accredited Representative considers that the report would more accurately reflect the true position as represented by the evidence if the third causal factor was deleted because the Shorts 330 crew complied with their clearance which they read back to ATC.

4 - RECOMMENDATIONS

4.1 Runway Occupation

The investigation showed the importance for safety of great precision in runway usage and the grave risks created by any misunderstanding, especially when the aerodrome's procedures allow for the occasional presence of more than one aircraft on the runway. Consequently, the BEA recommends that:

4.1.1. Aéroports de Paris and the DGAC together study all of the procedures and associated means for the simultaneous use of two different parts of a runway so as to guarantee, in all circumstances, the same level of safety as when the runway is used by only one aircraft.

and in particular that:

4.1.2. terminology used in practice by the ground controller include the systematic identification of the holding point specific to the required taxiway during the instruction to taxi towards the runway;

4.1.3. terminology used in practice by the aerodrome air traffic control include the systematic identification of the taxiway from which the aircraft must line up;

4.1.4. terminology used in practice by the aerodrome air traffic control systematically include, where a clearance is issued to line up behind a departing aircraft, the formal and unambiguous identification of said aircraft;

4.1.5. the procedure for sequential line-up be defined, as well as conditions for its application;

4.1.6. the control positions at Paris Charles de Gaulle aerodrome be equipped with the latest ground radar equipment;

4.1.7. the use of high speed exits for line-ups be subject to the existence of arrangements which guarantee a level of safety equivalent to visual checks performed by the crew.

In addition, and stressing that the investigation did not aim to evaluate the advantages and disadvantages of the systematic use of a single language, that:

4.1.8. in the light of the analysis of this accident and previously acquired experience, the DGAC study the expediency and methods of implementation for the systematic use of the English language for air traffic control at Paris Charles de Gaulle aerodrome, as well as the extension of this measure to other aerodromes with significant international traffic.

4.2 Organisation of ATC

The investigation brought to light the inadequacy of individual or cross check procedures for tasks, and the importance of a more systematic and rigorous definition of ATC methods and practices.

Consequently, the BEA recommends that:

4.2.1. the DGAC establish a precise definition and a verification procedure for control tower operations manuals;

4.2.2. the DGAC study the implementation in ATC practices of systematic checking procedures;

4.2.3. the DGAC accelerate and systematize the implementation of an ATC resource management training course, specifically taking into account questions related to co-ordination.

The BEA also recommends that:

4.2.4. the functions of an assistant (role, prerogatives and possible manning of the position) be defined;

4.2.5. it only be permissible for the tower manager to handle a control position where this remains compatible with his other responsibilities;

4.2.6. procedures for releasing controllers to duty be defined so as to exclude this being dependant on self-assessment.

Appendices

APPENDIX 1
Transcript of radio communications
Transcript of the ATIS

APPENDIX 2
Transcript of CVR on G-SSWN
Transcript of CVR on F-GHED

APPENDIX 3
F-GHED FDR Graph

APPENDIX 4
Reconstitution of aircraft tracks during airprox on 6 October 1998 and on 17 May 1999

APPENDIX 5
Panoramic view of the North tower control positions at Paris Charles de Gaulle

APPENDIX 6
Summary of significant events from 1st January to 30 June 2000 at Paris Charles de Gaulle

APPENDIX 7
Summary of significant events from 1st to 30 September 2000 at Paris Charles de Gaulle

APPENDIX 8
Complete records of four runway incursions in September 2000 at Paris Charles de Gaulle

Transcripts of recordings made by the Service Quality subdivision of the ADP North ATC Service

24 May 2000 from 23 h 46.16 UTC to 00 h 33.47 UTC
POSITION: PVL, FREQUENCY: 126.650 MHz

FROM	TO	TIME	COMMUNICATIONS
LIB8807	PVL	23h46.16	PVL good day or rather good evening LIB 88 0 7 on Y 4. 5 min for MADRID.
PVL	LIB8807		LIB 88 0 7 good day, cleared for taxi depart from runway 27 LGL 8 A squawk 7 6 4 6.
LIB8807	PVL		So for a takeoff on 27, LGL 8 A, squawking 7 6 4 6.
PVL	LIB8807		That's correct and 121.6, goodbye.
LIB8807	PVL	23h46.49	21 6, have a good evening.
			...
SSW200	PVL	00h33.22	De Gaulle flight data good evening, Streamline two hundred, SHORT 3 30 on November 51 with information OSCAR requesting start up and clearance.
PVL	SSW200	00h33.30	Streamline two hundred start up approved runway 2 7, OPALE 8 Alpha departure squawk 7 5 6 1.
SSW200	PVL	00h33.36	...way 2 7 OPALE 8 Alpha departure and squawking 7 5 2 1, Streamline two hundred.
PVL	SSW200	00h33.43	7 5 6 1 for the squawk and 1 2 1 8.
SSW200	PVL	00h33.47	7 5 6 1 and 1 2 1 8, Streamline two hundred.

25 May 2000 from 00 h 08.06 UTC to 00 h 19.30 UTC
POSITION: SOL.N FREQUENCY: 121.600 Mhz

FROM	TO	TIME	COMMUNICATIONS
LIB8807	SOL.N	00h08.06	Ground LIB 88 0 7 on Y 4 for pushback.
SOL.N	LIB8807		LIB 88 0 7 um... cleared for pushback.
LIB8807	SOL.N		We're pushing back excuse us for the delay there was a problem with the hydraulics and the pushback.
SOL.N	LIB8807		Ok, well, there's no problem.
LIB8807	SOL.N		We are pushing back sir.
			...
LIB8807	SOL.N	00h12.40	Ground LIB 88 0 7 for taxiing to 27.
SOL.N	LIB8807		88 0 7 taxi to runway 27 holding point.
LIB8807	SOL.N		For the 27 holding point, do you want us to take the loop ... towards loop 10 backtracking or shall we go the whole way round?
SOL.N	LIB8807		Ah so you go the whole way round in fact so you go via A 2 A 5 then B 2
LIB8807	SOL.N		A 2 A 5 B 2 88 0 7.
			...
SOL.N	LIB8807	00h19.18	LIB 88 0 7 first right by B 2.
LIB8807	SOL.N		First right LIB 88 0 7.
SOL.N	LIB8807		LIB 88 0 7 switch to De Gaulle tower 129 25.
LIB8807	SOL.N	00h19.30	19 25 good luck.

DATE: 25 May 2000 from 00h22.16 UTC to 00h29.36UTC
POSITION: LOC.N FREQUENCY: 119.250 Mhz

FROM	TO	TIME	COMMUNICATIONS
LOC.N	LIB8807	00h22.16	LIB 88 0 7?
LIB8807	LOC.N		Yes, good evening sir.
LOC.N	LIB8807		88 0 7 good evening, line up runway 27 cleared for takeoff 230°/14 at 21 kts.
LIB8807	LOC.N		We line up and take off from 27 LIB 88 0 7.
			...
LIB8807	LOC.N	00h23.41	LIB 88 0 7 we are maintaining position for 30 seconds.
LOC.N	LIB8807	00h23.46	Yes, do you have a problem?
LIB8807	LOC.N	00h23.47	Um... yes, we need a quick read and we will report in 30 seconds.
LOC.N	LIB8807	00h23.53	Keep me informed if you need any assistance, advise me.
LIB8807	LOC.N		No sir, it's a little personal check.
LOC.N	LIB8807		Okay.
LOC.N	LIB8807	00h27.11	LIB 88 0 7 do you have access to taxiway 18?
LIB8807	LOC.N		Um... yes we're going over there sir.
LOC.N	LIB8807		Ok 18 and keep me informed sir.
LIB8807	LOC.N		We are going onto taxiway 18 LIB 88 0 7.
			...
LOC.N	LIB8807	00h28.29	88 0 7 are you really on 18?
LIB8807	LOC.N		Um...yes sir. Ah no at the moment we're on ... we're taxiing on 17 now no on 17.1.
LOC.N	LIB8807		Okay you're on 17.1 and you have... how far are you, are you about 200 metres from 18?
LIB8807	LOC.N		Affirmative.
LOC.N	LIB8807		Is there anyone in front of you?
LIB8807	LOC.N		No nobody.
LOC.N	LIB8807		Okay, tell me when you're on 18 and that the access is free behind.
LIB8807	LOC.N		Ok, we are going forward slowly sir.
			...
LOC.N	LIB8807	00h29.33	88 0 7 contact ground on 121.6 talk to you soon.
LIB8807	LOC.N	00h29.36	21.6.

DATE: 25 May 2000 from 00h29.39UTC to 00h47.13UTC
POSITION: SOL.N AND SOL.S FREQUENCY: 121.600 MHz

FROM	TO	TIME	COMMUNICATIONS	OBS.
LIB8807	SOL	00h29.39	Ground, good evening, hello again LIB 88 0 7.	
SOL	LIB8807		LIB 88 0 7 there, good evening, you are on Quebec taxiway eh ... would you be ready to depart?	
LIB8807	SOL		On... Monsieur, we have to fix a small problem here and we will call back in 2 minutes.	
SOL	LIB8807	00h29.57	Ok, LIB 88 0 7 so ok listen if this problem is resolved you will depart from 26 right that will be much easier for you a departure LGL 8 B.	

FROM	TO	TIME	COMMUNICATIONS	OBS.
LIB8807	SOL	00h30.08	Ah, well listen, yes okay so we will have to change everything then!	
SOL	LIB8807		Well, it's as you like but there to backtrack…. err	
LIB8807	SOL		No, but we don't understand; we have a technical problem to solve, we asked for 2 minutes and we can't, we're not stopping we can't find the problem.	
SOL	LIB8807	00h30.20	Ok, no but umm … solve your problem 88 0 7, it's not a problem.	
LIB8807	SOL		Ok, we're going to sort out the problem and then we'll possibly backtrack if we can and if not we'll take 26 right as you say.	
			...	
SSW200	SOL	00h38.20	Ground good evening Streamline two hundred November 51 requesting taxi.	
SOL	SSW200	00h38.25	Streamline two hundred taxi holding point 27.	
SSW200	SOL	00h38.28	Taxi holding point 27, Streamline two hundred.	
LIB8807	SOL	00h40.49	Libert... Ground Liberté 88 0 7?	
SOL	LIB8807	00h40.52	Yes 88 0 7 I'm listening.	
LIB8807	SOL	00h40.53	Yes, unless we can do… so we have resolved our problem, unless we can do a 180, we'll take 26 as you suggested.	
SOL	LIB8807	00h41.01	Yes, 88 0 7 or otherwise on Quebec there 's a track split I think you can maybe go back round rather than do a 180 on the taxiway which seems a bit doubtful.	
LIB8807	SOL	00h41.10	Roger we're going to..	
LIB8807	SOL	00h41.12	... we're going to do a… 180 on the Quebec track split.	
SOL	LIB8807	00h41.15	Err... not a 180 eh, you go straight on and in the bend you have a Quebec track split.	
LIB8807	SOL	00h41.24	Ok, roger...88 0 7.	
SOL	SSW200	00h44.25	Streamline two hundred do you wish an intersection for departure?	
SSW200	SOL	00h44.27	Intersection 16 please, Streamline two hundred.	(scrambled)
SOL	SSW200	00h44.30	Say again please?	
SOL	SSW200	00h44.33	... Streamline two hundred say again your... your intentions.	
SSW200	SOL	00h44.40	We'd like to take intersection 16 for 27.	
SOL	SSW200	00h44.43	That's fine so 16 is approved, Streamline two hundred.	
SSW200	SOL	00h44.46	Two hundred.	
SOL	LIB8807	00h47.10	Liberté 88 0 7 monitor De Gaulle Tour on 119 25 good luck.	
LIB8807	SOL	00h47.15	Yes de 19 25 and for... thanks a lot...	
SOL	LIB8807	00h47.13	...	
SOL	SSW200	0h48.40	Streamline two hundred monitor tower 1 1 9 2 5.	
SSW200	SOL	00h48.42	1 1 9 2 5 Streamline two hundred.	

DATE: 25 May 2000 from 00h47.47 UTC to 01h15.16UTC
POSITION: LOC.N FREQUENCY: 119.250 MHz - LOC.S FREQUENCY: 120.900 MHz

FROM	TO	TIME	COMMUNICATIONS	OBS.
LOC	LIB8807	00h47.47	Liberté 88 0 7 De Gaulle.	
LIB8807	LOC	00h47.50	Yes, good evening again sir, sorry about that.	
LOC	LIB8807	00h47.52	88 0 7 you're welcome … I can confirm departure on Eagle 8 Bravo.	
LIB8807	LOC	00h47.59	On 27 8 Bravo?	
LOC	LIB8807	00h48.01	88 0 7 it will be a departure on Eagle 8 Bravo.	
LIB8807	LOC	00h48.09	Err... roger 88 0 7.	
LIB8807	LOC	00h48.14	Sorry ... we're lined up ... we're lined up on 27 here?	
LOC	LIB8807	00h48.18	My mistake 88 0 7 so it is really 27 and it will be a departure on Eagle 8 Alpha.	
LIB8807	LOC	00h48.23	8 Alpha OK no problem.	
LOC	LIB8807	00h48.29	Liberté 88 0 7 report 7 37 in sight on short final on 27.	
LIB8807	LOC	00h48.33	We have an aircraft on final and it's a 37 we... we see it clearly	
LOC	LIB8807	00h48.37	Liberté 88 0 7 behind the traffic on short final on 27, line up behind and wait.	
LIB8807	LOC	00h48.42	After the traffic on final and if it's a 37 we line up and hold position ... runway 27, Liberté 88 0 7.	
LOC	BXI320	00h48.49	Bravo X-ray India 3 2 0 contact De Gaulle departure 3 3 3 7, adios.	
BXI320	LOC	00h48.54	3 3 3 7 bye bye.	
BXI320	LOC	00h49.37	Can you repeat the frequency for the Bravo X-ray 3 2 0?	
LOC	BXI320	00h49.40	3 2 0 sorry contact 1 1 8 1 5.	
BXI320	LOC	00h49.44	1 1 8 1 5 good bye.	
LOC	AEA941	00h50.05	... 9 4 1 contact ground 1 2 1.6 good bye.	
AEA941	LOC	00h50.08	1 2 1.6 good by, 9 4 1.	
LOC	LIB8807	00h50.49	Liberté 88 0 7, cleared for takeoff 27, 230°, 10 à 15 kts.	
LIB8807	LOC	00h50.52	Taking off on 27... LIB 88 0 7.	
LOC	SSW200	00h50.57	Streamline two hundred line up runway 2 7 and wait, number two.	
SSW200	LOC	00h51.00	Line up runway 2 7 and wait, Streamline two hundred.	
			...	
LOC	FUA7536	00h51.07	Futura 7 5 3 6 De Gaulle.	
FUA7536	LOC	00h51.10	Good evening 7 5 3 6.	
LOC	FUA7536	00h51.13	7 5 3 6 confirm holding point runway 2 6 right?	
FUA7536	LOC	00h51.16	Holding point on Whisky 10.	
LOC	FUA7536	00h51.18	Roger Futura 7 5 3 6 runway 2 6 right line up cleared for take off, 2 2 0° 11 to 17 knots.	
FUA7536	LOC	00h51.27	Line up and cleared for take off 2 6 right, Futura 7 5 3 6.	
BCS8263	LOC	00h51.47	Good evening Euro Trans 8 2 6 3 on freq holding 2 7.	

FROM	TO	TIME	COMMUNICATIONS	OBS.
LOC	BCS8263	00h51.51	Euro Trans 8 2 6 3 line up in sequence number 3.	
BCS8263	LOC	00h51.57	Line up and wait on runway 2 7, Euro Trans 8 2 6 3.	
LIB8807	LOC	00h52.23	Ground from Liberté 88 0 1, we have just hit another aircraft on taxi... on takeoff.	(the pilot called on 88 01)
LOC	LIB8807	00h52.29	Confirm that you have hit an aircraft, Liberté 88 0 7!	
LIB8807	LOC	00h52.32	Affirmative.	
LOC	LIB8807	00h52.34	88 0 7, copy. Do you want the emergency services?	
LIB8807	LOC	00h52.40	Err... we're going to vacate...	
LOC	LIB8807	00h52.44	88 0 7 do you have any damage...	
LIB8807	LOC	00h52.46	Certainly on the wing... yes.	
LOC	LIB8807		Can you still taxi?	
LIB8807	LOC	00h52.47	We're going to taxi sir... we're vacating... we're alerting our cabin crew.	
LOC	LIB8807	00h52.51	88 0 7, you can vacate at the end...	
LIB8807	LOC	00h52.55	Vacating at the end and it was a SHORT sir which came onto the runway.	
LOC	LIB8807	00h53.01	Roger.	
BCS8263	LOC	00h53.03	Euro Trans 8 2 6 3 confirm we were clear for line up runway 2 7?	
LOC	SSW200	00h53.18	Two hundred... De Gaulle.	
LOC	SSW200	00h53.21	Streamline two zero zero De Gaulle.	
LOC	SSW200	00h53.27	Streamline two zero zero.	
LIB8807	LOC	00h53.35	Liberté 88 0 7, so we touched the wing, I can't tell you, I think that it's the nose… err… I'm not sure of that.	
LOC	LIB8807	00h53.43	Roger 88 0 7.	
LIB8807	LOC	00h53.46	And it was a SHORT 3 60 I think... and if... the height of the wing I think.. I can't tell you… I'm sorry	
LOC	LIB8807	00h53.54	Copied 88 0 7.	
LOC	SSW200	00h53.56	Streamline two hundred De Gaulle.	
			A background noise....	
LOC	SSW200	00h54.19	Two hundred De Gaulle.	
LOC	BES8263	00h54.25	Euro Trans 8 2 6 3 contact ground 1 2 1 6.	
BES8263	LOC	00h54.29	1 2 1 6 Euro Trans 8 2 6 3.	
LOC	021	00h54.33	Méditerranée zero twenty... zero twenty-one and contact Ground on 121 6.	
021	LOC	00h54.38	With ground 21 6. 0 21, goodbye.	
LOC	FUA7536	00h54.42	Futura 7 5 3 6 contact departure 1 3 3 3 7.	
		00h54.46	A background noise....	
LOC	SSW200	00h55.08	Streamline two hundred De Gaulle.	
LIB8807	LOC	00h55.11	88 0 7 we have vacated 27... I... have you send the emergency services to the other aircraft?	
LOC	LIB8807	00h55.18	Yes I think it's under way.	
LOC	LIB8807	00h55.20	88 0 7 contact 121 6.	
LIB8807	LOC	00h55.23	21 6. 88 0 7.	
FUA7536	LOC	00h55.27	Say again the frequency for Futura 7 5 3 6?	
LOC	FUA7536	00h55.30	1 3 3 decimal correction 1 1 8 1 5, 1 1 8 1 5.	
FUA7536	LOC	00h55.34	1 1 8 1 5, bye bye.	
LOC	SSW200	00h55.38	Streamline two hundred De Gaulle.	

FROM	TO	TIME	COMMUNICATIONS	OBS.
LOC	SSW200	00h56.01	Two hundred De Gaulle.	
RMK: Separation of frequencies 119.250 Mhz and 120.900 Mhz at 01h00.58				
LOC.N	SSW200	01h01.24	... Two hundred if you head you May... shut down your shut your engine Fire Service will... will be... very close to you.	
LOC.N	SSW200	01h01.44	... Line two hundred if you read Fire Service hold... hold the hold on the situa... the... situation so shut down the engine.	
AEA957	LOC.N	01h09.03	De Gaulle good evening Europa 9 5 7.	
AEA957	LOC.N	01h09.43	De Gaulle good evening Europa 9 5 7.	
END of monitoring of LOC North at 01h15.16				

ATIS 25 May 2000 FREQUENCY 127 MHz

This is Charles de Gaulle, Information November recorded at 2 3 1 0.
ILS approach landing runway 27 and 26 left.
Takeoff runway 27 and 26 right.
Planned departure routing 8 Alpha 8 Bravo 8 Yankee.
Taxiways Whisky 2, Fox 6, 1 6. 1, 1 7. 1, H P 1 and 1 7 closed.
Transition level 5 0
C G O unserviceable
De Gaulle Tower Frequency 2 6 right and 2 6 left 1 2 0. 9
Wind: 2 2 0 degrees 1 0 knots.
CAVOK
Temperature 1 7 degrees
Dew point 1 1 degrees
QNH: 1 0 1 1
Q F E runway 27: 0 9 9 7
Runway 26 right: 0 9 9 9
Runway 26 left: 1 0 0 0
Confirm November received on first contact

This is Charles de Gaulle, Information Oscar recorded at 0 0 1 0
ILS Approach landing runway 2 7 and 2 6 left.
Take off runway 2 7 and 2 6 right.
Expect departure 8 Alpha 8 Bravo 8 Yankee
Taxiway Whisky 2, Fox 6, 1 6. 1, 1 7. 1, H P 1 and 1 7 closed.
Transition level 5 0
C G O unserviceable
De Gaulle tower frequency for 2 6 right and 2 6 left 1 2 0. 9
Wind 2 3 0 degrees 1 5 knots
Visibility 10 kilometres
Light Rain
Scattered 2 3 0 0 feet
Scattered 6000 feet
Broken 1 0 000 feet
Temperature 1 5 degrees
Dew point 1 2 degrees
QNH 1 0 1 1
QFE runway 2 7 0 9 9 7
Runway 2 6 right 0 9 9 9
Runway 2 6 left 0 9 9 9
Confirm OSCAR received on first contact.

FOREWORD

The following is a transcript of elements which were comprehensible, at the time of the preparation of the present report, during readout of the cockpit voice recorders on board the Shorts G-SSWN and the MD-80 F-GHED.

This transcript contains conversations between crew members, various noises corresponding, for example, to the use of controls or to the alarms, radiotelephonic messages between the crew and Air Traffic Control services as well as messages from the other aircraft involved in the accident.

The reader's attention is drawn to the fact that the recording and transcription of the CVR are only a partial reflection of events and of the atmosphere in the cockpit. Consequently, the utmost care is required in the interpretation of this document.

GLOSSARY

=>	**Communications with ATC, CC or passengers**
( )	Words or groups of words where some doubt persists
(@)	Words or groups of words not understood
(...)	Words or groups of words which neither interfered with the normal conduct of the flight nor add any elements useful for the analysis or understanding of this event
(@)	Various noises, alarms.
Ctl	ATC centre on the frequency in use
PA	Public Address
CC	Cabin crew
Time	UTC time synchronised with UTC time recorded at the ATC centre
VHF	VHF Conversations
SV	Aircraft synthetic voice

SHORTS 330				
Time	**Captain**	**First Officer**	**VHF**	**Observations**
0 h 32 min 16 s				Beginning of CVR
0 h 37 min 02 s	ok fifty three starts out			Beginning of transcript
37 min 05 s	stabilised down after starts			
37 min 06 s		ok start master		
37 min 07 s	normal			
37 min 08 s	both off	ignition		
37 min 09 s	internal	electrical master		
37 min 10 s	both	generators left and right		
37 min 11 s	both on			
37 min 12 s		shedding buses		
37 min 13 s	they're both to normal			
37 min 14 s		external supply		
37 min 15 s	is waved away			
37 min 16 s		inverter volts		
37 min 17 s	volts and frequencies are fine	electrical mis		
37 min 18 s	electrical mis are all vertical			
37 min 20 s		emergency lights reset		
37 min 21 s	yeh			
37 min 22 s		hatch DV window		
37 min 23 s	secure my side			
37 min 24 s		all secure ontor		
37 min 25 s		hydraulics		
37 min 26 s	hydraulics in the green pressures are normal			
37 min 29 s		performance speeds we've got		
37 min 30 s	they're bugged yeh ninety-nine (ok at) ninety-nine			
37 min 32 s		avionics		
37 min 33 s	they can all go on now one			

SHORTS 330				
37 min 38 s	(*) remind you that the other thing I was going to tell you why'd you turn them off because you've left that one on and that one on go though them from there there there there leave that one on that and that you get get do a flow and then you don't miss anything	Yeh yeh		
37 min 50 s		yeh good point		
37 min 52 s		ok where are you flaps		
37 min 55 s	flaps should go to four			
37 min 57 s		four set four indicating		
37 min 59 s	alrighty			
0 h 38 min 01 s		uh props		
38 min 02 s	props uh yeh we'll bring I those up			
38 min 06 s	emergency brakes to normal			
38 min 08 s		yeh auto feather		
38 min 09 s	we've done that don't worry about that again			
38 min 10 s		ready for taxi		
38 min 11 s	uh yeh ready for taxi			
38 min 12 s		ok		
38 min 18 s		uh this is tower ground		
38 min 19 s	ground yeh			
38 min 20 s		=> ground good evening Streamline Two Hundred November fifty one requesting taxi		
38 min 25 s			(Ctl) Streamline Two Hundred taxi holding point two seven	
38 min 28 s		=> taxi holding point two seven Streamline Two Hundred		
38 min 32 s	ok so			
38 min 44 s	try and get it round			
38 min 47 s	can I have the light on now	ok		
38 min 50 s		taxi light taxi lights on		

SHORTS 330				
38 min 51 s	uh then the checks			
38 min 53 s		ok taxi checks taxi lights are on brakes		
38 min 56 s	brakes I'll just check mine yeh pressures there just check yours	ok		
0 h 39 min 01 s	yeh I can see the pressure yeh	yeh pressure there		
39 min 03 s		steering you're checking		
39 min 04 s	ok turn is a right turn			
39 min 05 s	yeh	turning right turn increasing increasing turning right ball skidding left artificial horizon erect		
39 min 11 s	left turn	left turn decreasing decreasing left turn ball skidding right artificial horizon is erect		
39 min 16 s	yeh			
39 min 18 s		and the reserve power coming to arm that's your taxi checks are complete		
0 h 39 min 23 s	uh we'll go to the line			
39 min 24 s		going down to the line air conditioning and fan is manual and off ice protection		
39 min 31 s	seven and the light on this one			
39 min 33 s		seven and the light its down at the top two		
39 min 41 s		I'll miss one bugger somewhere that's it (perfect) seven and		
39 min 46 s	another light that's eight all together			
39 min 52 s		I'll (*) that then flap and trims flap set four trims neutral		
0 h 40 min 13 s		ok we're down to the line I'll hold it there		
40 min 15 s	yeh			
40 min 48 s	alrighty so we're up we're down to the line (*)			

SHORTS 330				
40 min 52 s		down to the line yeh		
40 min 53 s	ok			
0 h 42 min 05 s	is he going to slow us down this guy			
42 min 09 s		yeh		
0 h 43 min 20 s	you gotta you gotta time down yeh for the off yeh	absolutely		
43 min 23 s	oh oh oh right			
0 h 44 min 24 s			(Ctl) Streamline Two Hundred do you wish an intersection for departure	
44 min 27 s	intersection sixteen yeh	=> intersection sixteen please Streamline Two Hundred		
44 min 31 s			(Ctl) say again please	
44 min 33 s		got it yeh got it	(Ctl) Streamline Two Hundred say again your errh… your intentions	
44 min 40 s	=> errh we would like to take intersection one six for two seven			
44 min 43 s			(Ctl) that's fine so one six is approved Streamline Two Hundred	
44 min 46 s	=> (*)			
44 min 48 s	(*) I think the water's started to get in a bit now I think			
44 min 51 s		yeh		
0 h 45 min 11 s	although they don't call them intersections they call them block don't they block one six over here yeh			
45 min 14 s		block one six		
45 min 15 s	yeh			

SHORTS 330				
45 min 20 s	I wonder what	I remember coming out of Nantes one day with some passengers in an Aztec and as I rotated the bloody water just pissed out of the dash I thought oh shit		
45 min 27 s	also you think of all this electrics and the stuff pours in it's like being in a submarine	(*)		
45 min 36 s	I'm just wondering where he is going to go because if that's all closed down there again he's going to have to go on the runway and back backtrack			
45 min 45 s		ah you've lost me again sir		
45 min 47 s	(…)			laughter
45 min 49 s		I remember the hotel		
45 min 54 s	(*)			
45 min 57 s	oy remember where the tower is			
45 min 59 s		yeh		
0 h 46 min 01 s		you need a few trips and the handling just to get used to the place		
46 min 03 s	yeh			
46 min 08 s	this is like the M 1 connects north to south			
46 min 45 s	ah its getting busy look there's a few waiting down here			
46 min 47 s		aah		
0 h 47 min 10 s			(Ctl) Liberté eight eight zero seven de Gaulle Tower on one one nine two five good luck	
47 min 15 s			(Lib 8807) Yes one one nine two five and err thanks a lot	
47 min 59 s	well we'll soon be there			laughter
0 h 48 min 37 s			(Ctl) Streamline Two Hundred monitor tower one one nine two five	

SHORTS 330				
48 min 41 s		one one nine two five Streamline Two Hundred		
48 min 44 s	yeh so we're just monitoring that one yeh			
48 min 47 s		yeh		
48 min 48 s	we're not calling em	no		
48 min 49 s	yeh alright			
48 min 51 s	they get			
0 h 49 min 03 s	got something on the roll have we or			
49 min 32 s	you also have to watch the stops here as well cause you go by some you think there's one further down because you're quite a way from the runway I mean you end (up) the wrong side of the stops			
49 min 40 s		yeh		
0 h 50 min 00 s	that's on on standby (on that side)			
50 min 31 s	what's he doing then is he going or is just huh			
50 min 35 s	sitting on the runway			
50 min 36 s		that's the runway up there is it		
50 min 38 s	yeh			
50 min 39 s	I thought he'd just landed			
50 min 42 s		yeeh		
50 min 49 s			(Ctl) Liberté 88 0 7, cleared for take off 27, 230°, 10 à 15 kts	.
50 min 53 s			(Lib 8807) Taking off on 27... LIB 88 0 7.	
50 min 57 s			(Ctl) Streamline Two Hundred line up runway two seven and wait number two	
0 h 51 min 01 s		=> line up runway two seven and wait Streamline Two Hundred		
51 min 07 s		ok		

SHORTS 330				
51 min 11 s	where's the number one is he the number one			
51 min 19 s	ok I'll go below the line with the checks (*)			
51 min 22 s		going below the line then uh transponder		
51 min 24 s		coming on		
51 min 29 s		landing lights strobes		
51 min 32 s		landing lights and strobes on		
51 min 35 s		flying controls well C W P's clear		
51 min 39 s	yeh right its not actually 'cos you've still got the controls in sir			
51 min 41 s	yeh uh ha ha yeh ok	yeh past that so it's controls (but) fuel		laughter
51 min 45 s	can you see anything down there			
51 min 47 s		no I can't		
51 min 51 s		unless there's one coming out in front		
51 min 53 s	how about now			
0 h 52 min 01 s		shit		
52 min 02 s	(@)	(@)		Shock and end of recording

MD 83				
Time	**Captain**	**First Officer**	**VHF**	**Observations and other voices**
h 42 min 24 s		Beginning of recording		
42 min 25 s		No but wait for that there		
42 min 31 s	Yeh yeh it's working			
42 min 32 s		Ah that's what (*) there that's it we'll do a (*) take that or make a one eighty there in the… in the loop		
42 min 44 s	We'll take it like that then come back round the other way			
42 min 47 s		If not it's right straight away (*) come back like that		
42 min 50 s	No no they have to go back round there			
42 min 52 s		Well over there it's a (*)		
42 min 57 s		yes (*)		
42 min 58 s	I'll go back round there			
h 43 min 00 s		wait (*) if we're...		
43 min 04 s	yes it's ok we must be able to go back round there			
43 min 16 s	We'll end up with minimum fuel too			
43 min 28 s		You didn't do... (*)		
43 min 40 s		the no mode I... it cut off on starting the engines		
43 min 49 s		There's no flag to to (*) remaining on your side… and what does it say		
43 min 51 s	no	and what does it say?		
43 min 59 s	We simply have no autothrottle eh			
h 44 min 07 s		The flaps are armed		
44 min 14 s		Err nothing to be done eh		
44 min 16 s	no			
44 min 17 s		(*) two		
44 min 19 s	Hey we can do it in manual			

MD 83				
44 min 20 s 44 min 24 s		No no but and it's… since I've cut the no mode and by starting the engines then we're going to have to find a solution to put the...	(Ctl) Streamline Two Hundred do you wish an intersection for departure	
44 min 29 s			(SL200) intersection sixteen please Streamline Two Hundred	
44 min 31 s			(Ctl) say again please	
44 min 32 s	a solution to...			
44 min 33 s 44 min 34 s		(*) E P R at sixteen oops well there it's not even in the...	(Ctl) Streamline Two Hundred say again your errh… your intentions	
44 min 39 s	Well no it's all wrong there			
44 min 40 s			(SL200) errh we would like to take intersection one six for two seven	
44 min 42 s		(*)we'll be in basic (*)		
44 min 43 s			(Ctl) that's fine so one six is approved Streamline Two Hundred	
44 min 45 s 44 min 46 s	We'll be completely in basic there eh		(SL200) (*)	
44 min 47 s		completely		
44 min 48 s	completely			
44 min 50 s		Err so you saw it when starting the engines and on cutting them it removed the no mode		
h 45 min 02 s	If I thought about it I'd go back to the apron you know...			
45 min 07 s	... because we're not... we didn't prepare the flight EPR... err			

MD 83				
45 min 37 s		Ok I'll get out the check list level two nine zero related to altitudes the maximum takeoff thrust altitude pressure (*) RAT how much shall we say we have?		
45 min 28 s	Ah that's it it's it's come back fifty-six degrees plus			
45 min 32 s		No but there's a problem with that		
45 min 34 s	yes			
45 min 40 s		It doesn't know what it's doing any more		
45 min 41 s	Yeh the impression...	We'll let it do its... shit we will keep two zero zero		
45 min 45 s	I have the impression there's some water in the sensor eh			
45 min 49 s		So I confirm... (*) a thousand feet two zero five twenty-six degrees plus (*) takeoff		
45 min 56 s		(*) well there we have no (*) takeoff normal		
h 46 min 02 s	That's all eh	five hundred feet		
46 min 03 s	Ninety-four... eh...	twenty-six degrees two zero zero we'll take a ninety-eight... if you agree		
46 min 08 s	yes			
46 min 09 s		ah I am (...) sorry		
46 min 14 s		So a ninety-eight		
46 min 18 s		(*)		
46 min 21 s		the R A... the RAT will come back there's... eighty degrees that's hot eh		
46 min 33 s		As a reminder, N1 with twenty degrees with two zero zero we'll have eighty-one (*) we are in No mode because I have plus ten		
46 min 45 s	yeh	That's normal		

MD 83				
46 min 47 s	But how does it know it's plus ten?			
46 min 52 s		ah that must go back to normal		
46 min 55 s		Okay then (*) use… FL table sixty-nine nine zero air conditioning on anti ice off (*) seventy-six two nine zero		
h 47 min 03 s	It's here eh			
47 min 10 s			(Ctl) Liberté eight eight zero seven monitor de Gaulle Tower on one one nine two five good luck	
47 min 15 s		=> Yes on one nine two five good err thanks a lot eh		
47 min 26 s		okay ten err table nine seventy-six two nine zero I confirm at a weight of one thirty(*) one seventy-one the E P R... fuel flow (*) two hundred and ninety-three		
47 min 40 s	(*) we'll get the there... we'll get them ah we'll get them we'll get them			
47 min 47 s			(Ctl) Liberté eight eight zero seven de Gaulle?	
47 min 50 s		=> yes hello again sorry sir		
47 min 52 s			(Ctl) eight eight zero seven you're welcome err I confirm a departure on Eagle eight Bravo	
47 min 57 s	eight Bravo that's another thing			
47 min 59 s		=> on twenty-seven eight Bravo?		
h 48 min 01 s			(Ctl) eight eight zero seven that will be a departure on Eagle eight Bravo	
48 min 09 s		=> err roger eight eight zero seven		

MD 83				
48 min 12 s	What's the difference?			
48 min 14 s		=> Err sorry err we are lined up.. are we lined up on twenty-seven here?		
48 min 19 s			(Ctl) My mistake eight eight zero seven it is the two seven and it will be a departure on Eagle eight Alpha	
48 min 23 s		=> Eight Alpha okay it's it's no problem		
48 min 25 s	Yeh yeh			
48 min 27 s		So it's eight Alpha (*)		
48 min 27 s	It... it... it's tough for everyone			
48 min 29 s			(Ctl) Liberté eight eight zero seven report a seven three seven on short final in sight on two seven	
48 min 33 s		=> We have an aircraft on final and if it's a three seven we we can see it sir		
48 min 38 s			(Ctl) Liberté eight eight zero seven behind the traffic on short final to two seven you line up behind and wait	
48 min 42 s		=> After the traffic on final if it's a three seven we line up and we hold position runway two seven Liberté eight eight zero seven		
48 min 54 s	=> cabin crew takeoff in two minutes			
h 49 min 02 s	Go ahead takeoff			
49 min 03 s		If it's a three seven before check list		
49 min 15 s		(*) where were we before		
49 min 20 s		before takeoff engine ignition		
49 min 23 s	On err "off" on "on" sorry ha			
49 min 28 s		annunciator panels		
49 min 30 s	checked			

MD 83				
49 min 31 s		beacons		
49 min 32 s	on			
49 min 33 s	on	radar		
49 min 34 s		brake temperature		
49 min 36 s	err... fifty			
49 min 39 s		sixty passenger announcements (*) that would be (*) fifteen hundred and a bit		
49 min 42 s	That's done we are on auto... we're cleared to line up eh			
49 min 45 s		and we hold position		
49 min 46 s	Err ah yes okay			
49 min 47 s		yes we hold		
49 min 51 s		So you see it's not in the check list that when you are taxiing eh the RAT		
49 min 55 s	no			
49 min 56 s		There's nothing eh if you don't see it like		
49 min 57 s	We shouldn't depart we've only seen it in the air eh			
h 50 min 04 s	Okay? When we're in the air there's no more MEL eh			
50 min 12 s	eh?	For the return		
50 min 13 s		For the return		
50 min 15 s	ah you want... you who wanted to do some raw data you'll get your way			
50 min 19 s				laughter
50 min 21 s		and we're on it overall eh		
50 min 23 s	You can			
50 min 28 s	take off			
50 min 32 s		the NAV		
50 min 31 s	Nav			

MD 83				
50 min 35 s	One forty armed...	Checking centreline		
50 min 38 s	... and take off the check list is completed			
50 min 41 s		check list complete		
50 min 44 s	So there are...			
50 min 45 s		(*) three hundred seventy-five		
50 min 46 s	We're in manual eh ninety-eight			
50 min 48 s		Fifty-six		
50 min 49 s			(Ctl) Liberté eight eight zero seven cleared for take off two seven two hundred and thirty degrees ten to fifteen knots	
50 min 53 s		=> we are taking off on two seven Liberté eight eight zero seven		
50 min 57 s			(Ctl) Streamline Two Hundred line up runway two seven and wait number two	
50 min 58 s	Are you ready... are you ready?			
h 51 min 01 s		I'm ready	(SL 200) line up runway two seven and wait Streamline Two Hundred	
51 min 18 s	Are all the windows closed?			
51 min 27 s		top		
51 min 40 s		Engine parameters E P R N the E G T checked		
51 min 45 s	top one hundred knots	one hundred knots		
51 min 47 s	checked			
51 min 57 s		V one		
51 min 59 s		V R		
h 52 min 00 s	oh shit			
52 min 01 s		oh shit		
52 min 02 s	@	@		shock

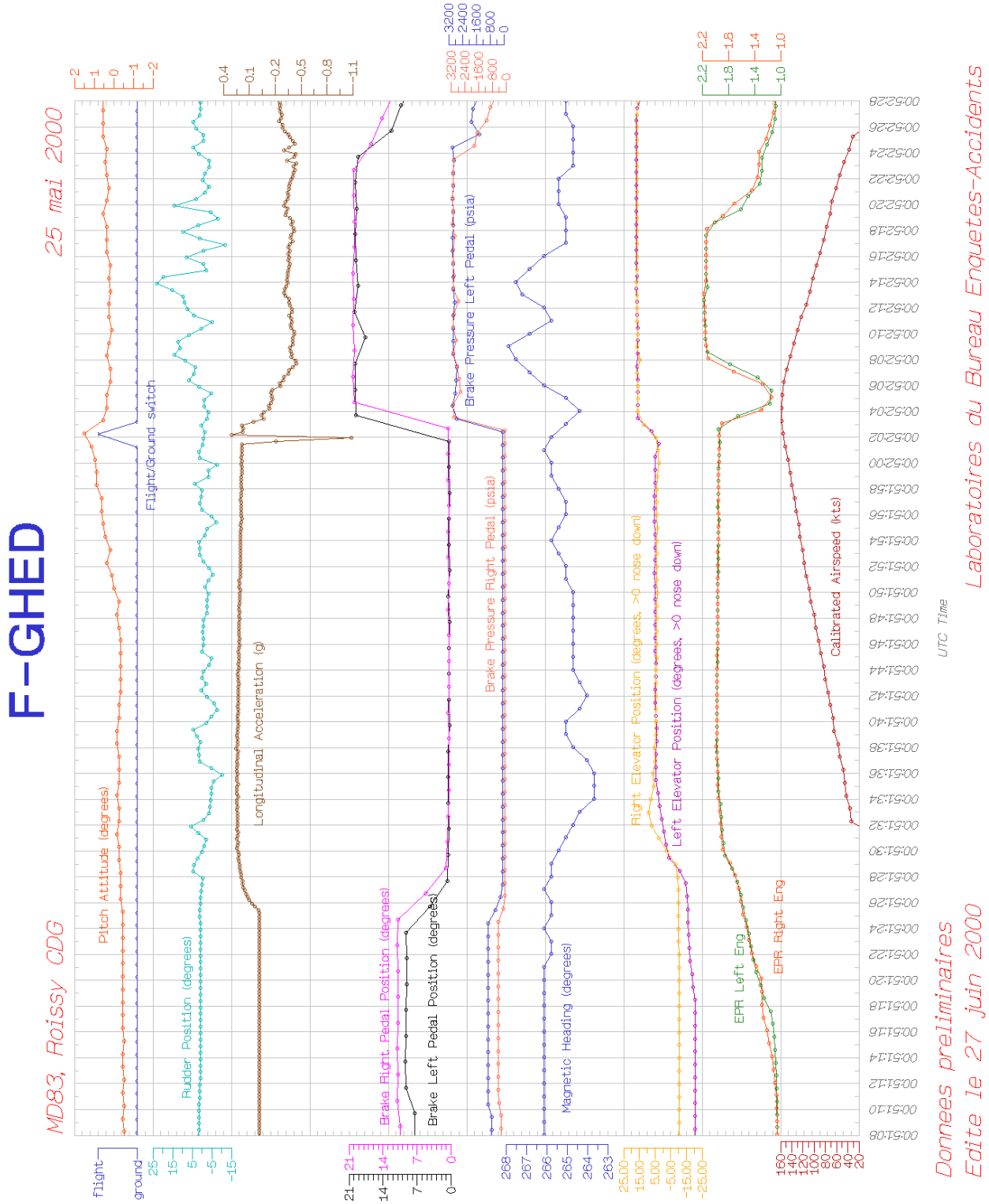
MD 83				
52 min 07 s	@	@		(SV) speed brake speed brake speed brake
52 min 22 s		=> Ground from Liberté eight eight zero seven, we have just hit another aircraft on taxi... on take off		.
52 min 29 s			(Ctl) Confirm that you have hit an aircraft, Liberté eight eight zero seven	
52 min 32 s		=> Affirmative		.
52 min 34 s	an STOL		(Ctl) eight eight zero seven, copy. Do you want the emergency services?	
52 min 37 s	yes... we're going to vacate at the next eh			
52 min 39 s		=> yes... we're going to vacate		
52 min 42 s			(Ctl) eight eight zero seven do you have any damage?	
52 min 44 s	ah yes eh eh	=> Certainly on the wing sir yes.		
52 min 46 s			(Ctl) Can you still taxi?	
52 min 47 s		=> We're going to taxi sir... we're vacating... we're alerting our cabin crew.		
52 min 51 s			(Ctl) eight eight zero seven, you can vacate at the end...	
52 min 55 s		=> Vacating at the end and it was a SHORT sir		
52 min 57 s	a Short eh			
52 min 58 s		=> which came onto the runway.		
h 53 min 01 s			(Ctl) roger	
53 min 05 s		Will you make the announcement?		

MD 83				
53 min 07 s 53 min 17 s 53 min 21 s 53 min 27 s	=> Ladies and gentlemen as you may have noticed we err hit another aircraft which came onto the runway by mistake we managed to abandon the take off and so we will vacate the runway in a few minutes in principle there is no damage apart from to the wing so no evacuation problems thank you we will be returning to the gate		 (Ctl) Streamline Two Hundred De Gaulle? (Ctl) Streamline Two Zero Zero De Gaulle? (Ctl) Streamline Two Zero Zero	
53 min 34 s		=> err Ground Liberté eight eight zero seven err so we touched the wing, I can't tell you, I think that it's the nose… err… I'm not sure of that	.	
53 min 43 s			(Ctl) roger eight eight zero seven	
53 min 45 s	Well they must have they're the ones who have some damage that's for sure			
53 min 46 s		=> And it was a SHORT 3 60 I think... and if... the height of the wing I think.. I can't tell you… I'm sorry		
53 min 54 s			(Ctl) copied err eight eight zero seven	 (CC) (*)
53 min 55 s		So have you got the wing?		
53 min 56 s			(Ctl) Streamline Two Hundred De Gaulle	(CC) the wing took a hit yes
53 min 57 s		So err (*)		
53 min 58 s	Yeh but he must be short of a cockpit			
h 54 min 01 s				(CC) what did you hit?
54 min 02 s		Well the guy was going for take off		
54 min 07 s				(CC) oh shit
54 min 11 s	reverse unlock			

MD 83				
54 min 15 s				(CC) are you ok?
54 min 16 s		eh?		
54 min 17 s		No but those guys must be in a bad way		(CC) are you ok?
54 min 19 s			(Ctl) Streamline Two Hundred De Gaulle	
54 min 20 s		(*)		
54 min 21 s				(CC) what hit the nose? did you hit the front of the plane
54 min 22 s		no no we ripped off the other plane's nose		
54 min 30 s	Maybe we should send them the emergency services if they have if they said nothing?			
54 min 33 s		they're not answering they're not answering		
54 min 39 s		We had we were cleared eh		
54 min 41 s	yes			
54 min 44 s		What problems do we have?		
54 min 46 s	Well the wing's broken			
54 min 47 s	Is the (*) wing broken?	eh?		
54 min 49 s		Shit eh did you see the speed we were going?		
54 min 51 s	well yes			
54 min 52 s		V R eh		
54 min 53 s	yes			
54 min 54 s	yes but we couldn't take off like that	eh		
54 min 55 s		(*) ah no hang on that's not a criticism eh it's...do you want me to go and see in the cabin?		
h 55 min 01 s	ah no but they just said that there's a … a missing			
55 min 03 s		No do you want me to go and talk to the passengers		
55 min 06 s	no no stay there stay there			

MD 83				
55 min 08 s			(Ctl) Streamline Two Hundred De Gaulle	
55 min 10 s	Nevertheless we mustn't ask			
55 min 11 s		=> eight eight zero seven we have vacated two seven have you sent the emergency services to the other aircraft?		
55 min 18 s			(Ctl) yes I think they've gone eight eight zero seven contact one two one six	
55 min 23 s		=> two one six eight eight zero seven		
55 min 33 s				(CC1=>) yes?
55 min 34 s				(CC2 =>) so to get the explanation it was an aircraft which during our takeoff entered err and apparently with the wing we touched the nose of the other aircraft which must be damaged then so I don't know if you are in fact they think the other one took a hit on the cockpit the two guys must be in a bad way eh that's it
55 min 37 s		=> Ground Liberté eight eight zero seven we have just vacated two seven		
55 min 42 s			(Ctl) Liberté eight eight zero seven err roger err can you tell me the type of problem anyway you have in.. you hit another aircraft is that correct?	
55 min 51 s		=> yes on takeoff we hit an aircraft with the left wing which had entered two seven I think…		(CC1=>) remain seated with seatbelts attached
55 min 53 s				(CC1=>) err so now we're returning to the terminal

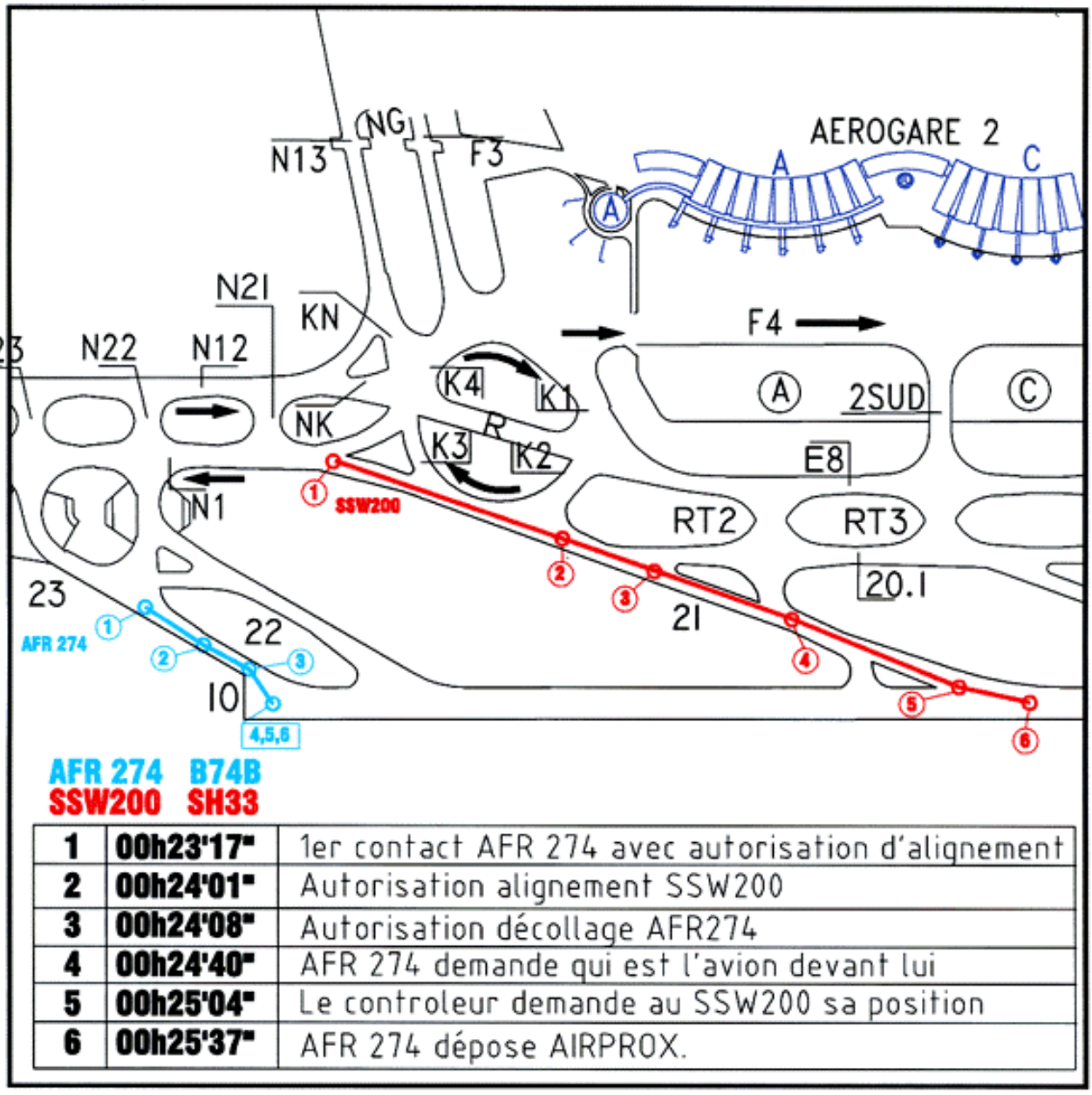
MD 83				
55 min 56 s				(CC2=>) ah yes yes now we're returning well we have we have a wing the wing is damaged
55 min 59 s	a Sh... a Short eh in theory			
h 56 min 00 s		=> a Short three sixty sir		(CC1=>) okay thanks
56 min 02 s			(Ctl) eh yeh well that's it eh he has he's just left the runway err so err eight eight zero seven I will call you back	
56 min 09 s		=> For information, we would like to know err we can't see from here it's about we don't know if we have a fuel leak from the wing so err for the time being there's nothing abnormal for us but on the other hand we'd like to know if the other aircraft had problems		
56 min 25 s			(Ctl) okay well there there he's just taxied so in theory it's not too bad but well err we don't have we've lost him on the frequency eh	
56 min 32 s	We must have ripped off the nose eh	=> roger sir		
56 min 34 s		=> We must have ripped off a piece of the nose eh		
End of the Transcript				


F-GHED
MD83, Roissy CDG
25 mai 2000
Pitch Attitude (degrees)
Flight/Ground switch
Rudder Position (degrees)
Longitudinal Acceleration (g)
Brake Right Pedal Position (degrees)
Brake Left Pedal Position (degrees)
Brake Pressure Right Pedal (psia)
Brake Pressure Left Pedal (psia)
Magnetic Heading (degrees)
Right Elevator Position (degrees, >0 nose down)
Left Elevator Position (degrees, >0 nose down)
EPR Left Eng
EPR Right Eng
Calibrated Airspeed (kts)
flight
ground
UTC Time
Donnees preliminaires
Edite le 27 juin 2000
Laboratoires du Bureau Enquetes-Accidents

SERVICE CIRCULATION AERIENNE NORD
SUBDIVISION ETUDES
C.D.G

RECONSTITUTION DES TRAJECTOIRES
DATE : 06/10/98
INDICATIFS : AFR 274/SSW200

AIRPROX°N 15/98



1	00h23'17"	1er contact AFR 274 avec autorisation d'alignement
2	00h24'01"	Autorisation alignement SSW200
3	00h24'08"	Autorisation décollage AFR274
4	00h24'40"	AFR 274 demande qui est l'avion devant lui
5	00h25'04"	Le controleur demande au SSW200 sa position
6	00h25'37"	AFR 274 dépose AIRPROX.

I.5 -RECONSTITUTION DES TRAJECTOIRES DES AERONEFS

SERVICE CIRCULATION AERIENNE NORD
SUBDIVISION ETUDES
C.D.G

RECONSTITUTION DES TRAJECTOIRES

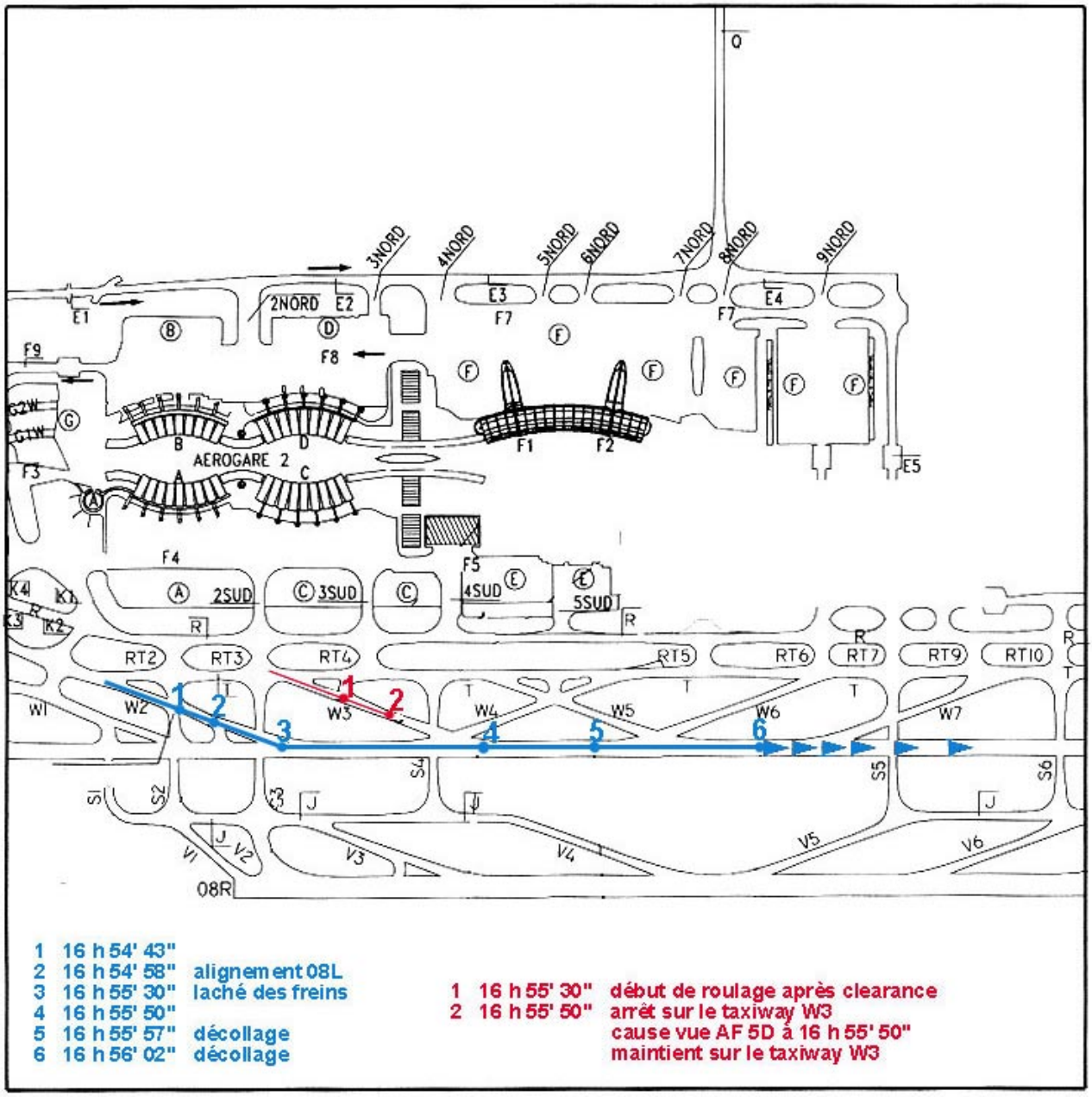
DATE 17/05/99
INDICATIFS AFR 2434 / AF 766-SD

AIRPROX N° 05/99

I . 5

AFR 2434

AF 766-SD



1 16 h 54' 43"
2 16 h 54' 58" alignement 08L
3 16 h 55' 30" laché des freins
4 16 h 55' 50"
5 16 h 55' 57" décollage
6 16 h 56' 02" décollage

1 16 h 55' 30" début de roulage après clearance
2 16 h 55' 50" arrêt sur le taxiway W3
cause vue AF 5D à 16 h 55' 50"
maintient sur le taxiway W3

Panoramic view of the control positions in the North Tower at Paris Charles de Gaulle (Photo taken a few days after the event in night conditions)

Summary
Significant Events from 01/01/2000 to 30/06/2000 at Paris Charles de Gaulle

RUNWAY INCURSIONS

Event	Source	INCA ref.	Date	Intensity	Risk	Recommended Measures	Measures taken	
							ATC	Airline
EWG370 crossed26R without authorisation	Report	16	08/01/00	H	Collision during take off		Letter addressed to airline	
AZA323 crossed 08L instead of stopping at holding point	Report	42	16/01/00	M	Collision during take off		Letter addressed to airline	
NFA992 entered 26R in front of an A/C on takeoff. Takeoff aborted.	Report	111	02/02/00	H	Collision during take off	Study of phraseology of signs and ground markings on S5	Feedback in the April 2000. CANA journal	
AZA341 lined up 26R without clearance	Report	115	02/02/00	M	Collision during take off		Feedback in the April 2000 CANA journal. Letter addressed to Alitalia	
ICAFD entered 26R without clearance (signs)	Report	151	09/02/00	L	Collision during take off	Study of phraseology of signs and ground markings on S5	Airline reminder	
EPA8098 crossed runway instead of lining up	Report	148	10/02/00	M	Collision during take off	Study of phraseology of signs and ground markings on S5	Airline reminder	
AZA36H cleared to line up on 26R from W7 crossed 26R on S5 and approached 26L.	Report	259	09/03/00	L	Collision with an A/C during landing	Study of phraseology of signs and ground markings on S5		
SAS562 took clearance for KLM 1232 as his own clearance	Report ASR	260	10/03/00	L	Collision during take off		Letter addressed to airline	
AFR 1127 was blocked 26R during crossing	ASR	391	16/03/00	L	Collision during take off	Clarify documentation so as to ensure everyone knows not to stop when leaving a parallel runway		
AFR2270 cleared for takeoff. AFR070 lined up too. A confusion of call signs caused this incident which led to a go around.	Report	403	14/04/00	L	Collision during take off			
SWR703 took the wrong route on the ground, entered S6 and crossed the runway without clearance. No traffic on 26R at that moment.	Report	427	19/04/00	L	Collision during take off		Letter will be addressed to airline	
JAL405 read back “cross” instead of “hold” and began crossing. AFR2048 on departure aborted its takeoff at the same time as it received instructions to stop its departure.	Report ASR	474	05/05/00	H	Collision during take off		Letter will be addressed to airline	

Event	Source	INCA ref.	Date	Intensity	Risk	Recommended Measures	Measures taken	
							ATC	Airline
EPA8081 and EPA8098 took S6 and advanced to the signs. An aircraft was departing during incursion by EPA8081.	Report	509	15/05/00	H	Collision during take off		Letter addressed to airline	
AFR1740 lined up in front of BMA175 instead of lining up behind	Report	522	18/05/00	L	Collision during take off			
COA55 lined up in front of an aircraft on final instead of lining up behind. In addition, it took off without clearance.	Report	525	18/05/00	M	Collision during take off		Crew asked for explanation. Awaiting response	
IST693 crossed runway 26R on S3 instead of taxiing to SI.	Report ASR	561	28/05/00	L	Collision during take off		Letter addressed to airline	
Taxiing towards holding point W7, DLH5793 continued on S5 and entered the service area. No traffic on departure.	Report	543	30/05/00	L	Collision during take off		Feedback posted. Ground markings added on the sector S5 to the south of W7: NO ENTRY	
AFR1168 performed a go around on 08L because an aircraft was announced as having passed STOP S5.	ASR	773	02/06/00	L	Collision during take off		Incident received late by the QSE Recordings could not be analysed	
A sweeper crossed runway 26R without clearance after inspection of 26L. It was supposed to return to the north of the field via the service road.	Report	616	07/06/00	L	Collision with an A/C on take off		Incident passed to the Ground Operations Subdivision for follow-up	
AAL62 passed stop S3 while DLH4099 was rotating. The “hold short off runway 26R on taxiway S3” had been read back.	Report ASR	705 Airprox RY - 09/00	20/06/00	H	Collision during take off		Airprox procedure initiated.	

SIGNIFICANT INCIDENTS
FROM 01/09/2000 TO 30/09/2000 at Paris Charles de Gaulle

A/C concerned	Factual Summary	Possible consequence of Incident
AF631GY	Refusal to cross via S4, due to BEA instruction.	
AFR1643	Airprox situation on ILS.	Mid-air collision.
	Speed regulation on arrival.	
AFR1241	Difficulty in obtaining an HAP.	
AFR825	Low visibility of ground markings at CDG.	
AFR1533	Breakdown of two radio assemblies and inappropriate regulations.	
DAH1006	Incursion AZA371 in front of DAH1006.	Collision during takeoff and landing.
AFR1763	Only one controller for 09L and 08R.	
AFR1028	Wake turbulence behind a Swissair.	
AFR2114	Request 4 200 from 08L.	
SAS1563	DIIL5789 lined up in front of SAS1563 instead of lining up behind.	Collision during takeoff and landing.
AFR171	Inadequate staffing. Frequency overloaded.	
TSC293	TSC293 took off from R, retracted the wheels at W7 and created turbulence for AFR1071.	
AF763QJ	Inappropriate overtaking at W2.	
AFR1303	Risk of ground collision.	Collision during taxiing.
AFR009	Airprox reported.	
AFR2035	Wake turbulence from a departure felt by arriving aircraft.	

09/10/2000

DOSSIER D'INCIDENT

dernière MAJ: 11/09/2000

Identifiant : 1126 LFPG 2000

Numérotation locale

N°airprox civil : 0	N°-hnrn :
N°airprox mixte	N°-hnal :
N°-t-cas :	N°-hn :
Commission local ☐	

Date de l'incident: 09/09/2000

Heure UTC: 19:07

Service traitant : QSE Suivi par :

Aéronefs concernés : DAH1006 AZA371

Secteur : LOC.S Regroupement:

TYPE D'INCIDENT

1	06-INCIDENT SOL	04. PISTE /INCURSION	01. AERONEF
2	07-INCIDENT CIRCULATION AERODROME	02. REMISE DE GAZ	
3			

Militaires concernés : ☐ Vfr: ☐ Réclamation: ☐ Infraction: ☐

Organismes concernés : LFPG

Systèmesconcernés :

Résumé des faits: Incursion de l'AZA371 devant DAH1006

Chronologie (fiche): AZA371 en contact avec le sol SW ne s'arrête pas au STOP du point d'arrêt W1 et pénètre sur la piste 08L impliquant la remise de gaz de DAH1006.
En effet DAH1006 avait demandé la 08L pour l'atterrissage pour cause de longueur de piste insuffisante en 08R.

Pièces jointes au dossier :

Enrg STR	☐	Trajecto	☐	Msg XPLN	☐	Strip	☐	Lettre	☐
Fréquence	☒	Téléphone	☐	Dump PLN	☐	Fax	☐	Réponse	☐

Autres pièces jointes :

Etat de traitement : EN COURS

DOSSIER D'INCIDENT

09/10/2000

Identifiant : 1140 LFPG 2000

dernière MAJ: 13/09/2000

Numérotation locale

N°airprox civil : 0	N°-hnrn :
N°airprox mixte	N°-hnal :
N°-t-cas :	N°-hn :
Commission local ☐	

Date de l'incident: 11/09/2000

Heure UTC: 19:43

Service traitant : QSE Suivi par :

Aéronefs concernés : SAS1563 DLH5789

Secteur : LOC.N Regroupement:

TYPE D'INCIDENT

1	06-INCIDENT SOL	04. PISTE /INCURSION	01. AERONEF
2	07-INCIDENT CIRCULATION AERODROME	02. REMISE DE GAZ	
3			

Militaires concernés : ☐ Vfr: ☐ Réclamation: ☐ Infraction: ☐

Organismes concernés : LFPG

Systèmesconcernés :

Résumé des faits: DHL5789 s'aligne devant SAS1563 au lieu de s'aligner derrière

Chronologie (fiche): DLH5789 est autorisé à s'aligner dderrière le trafic en finale et s'aligne devant.

Pièces jointes au dossier :

Enrg STR	☐	Trajecto	☐	Msg XPLN	☐	Strip	☐	Lettre	☐
Fréquence	☐	Téléphone	☐	Dump PLN	☐	Fax	☐	Réponse	☐

Autres pièces jointes :

Etat traitement : EN COURS

09/10/2000

DOSSIER D'INCIDENT

dernière MAJ: 25/09/2000

Identifiant : 1215 LFPG 2000

Numérotation locale

N°airprox civil : 0	N°-hnrn :
N°airprox mixte	N°-hnal :
N°-t-cas :	N°-hn :
Commission local ☐	

Date de l'incident: 16/09/2000

Heure UTC: 15:59

Service traitant : QSE Suivi par :

Aéronefs concernés : AZA325 MAH555

Secteur : LOC.S Regroupement:

TYPE D'INCIDENT

1	05- RESPECT CLAIRANCE/PROCEDURE /REG	01. CLAIRANCE	
2	02-SIMILITUDE D'INDICATIFS	01. AVEC INCIDENT	
3			

Militaires concernés : ☐ Vfr: ☐ Réclamation: ☐ Infraction: ☐

Organismes concernés : LFPG

Systèmesconcernés :

Résumé des faits: Similitude d'indicatifs, MAH555 prend la clairance de décollage de AZA325

Chronologie (fiche): MAH555 autorisé alignement et attendre de W10.
AZA325, créneau avant et + rapide arrive à W7, autorisé alignement et décollage.
AZA325 interrompt l'alignement car MAH555 a commencé le décollage.
Après remarque au MAH555, il répond qu'il a compris que le décollage était pour lui.
=> ressemblance des indicatifs. Le MAH collationne par "trible five" (et non MAH triple five) avec "Alitalia three two five".
Je voudrais savoir ce qui a été collationné après l'autorisation donnée à l'AZA.

Pièces jointes au dossier :

Enrg STR	☐	Trajecto	☐	Msg XPLN	☐	Strip	☐	Lettre	☐
Fréquence	☒	Téléphone	☐	Dump PLN	☐	Fax	☐	Réponse	☐

Autres pièces jointes :

Etat du traitement : EN COURS

DOSSIER D'INCIDENT

09/10/2000

Identifiant : 1235 LFPG 2000

dernière MAJ: 28/09/2000

Numérotation locale

N°airprox civil : 0	N°-hnrn :
N°airprox mixte	N°-hnal :
N°-t-cas :	N°-hn :
Commission local ☐	

Date de l'incident: 26/09/2000

Heure UTC: 19:50

Service traitant : QSE Suivi par :

Aéronefs concernés : FDX8A DLH4177

Secteur : LOC.S Regroupement:

TYPE D'INCIDENT

1	06-INCIDENT SOL	04. PISTE /INCURSION	01. AERONEF
2			
3			

Militaires concernés : ☐ Vfr: ☐ Réclamation: ☐ Infraction: ☐

Organismes concernés : LFPG

Systèmesconcernés :

Résumé des faits: Incursion sur piste de DLH4177 devant FDX8A

Chronologie (fiche): Le FDX8A aligné depuis W10 est autorisé à décoller piste 26R. Au même moment, le DLH4177 autorisé par le SOL.SW à rouler pour le point d'arrêt W7, ne marque pas le STOP et roule jusqu'à la piste 26R d'après AVISO qui fonctionnait normalement (OUF !!). Le FDX8A est stoppé immédiatement et le DLH4177 confirme qu'il est sur la piste 26R et qu'il n'a pas vu la ligne du point d'arrêt (il ajoute malgré tout qu'il pensait être autorisé à s'aligner). Quelques secondes plus tard le pilote du DLH4177 indique qu'en fait la ligne de point d'arrêt dur W7 n'était pas allumée (ce qui est confirmé par les pilotes de l'AF-MC et DLH4063 attendant derrière. Les seules lumières indiquant le point d'arrêt sont les feux rouges sur les côté de W7).

Pièces jointes au dossier :

Enrg STR	☐	Trajecto	☐	Msg XPLN	☐	Strip	☐	Lettre	☐
Fréquence	☐	Téléphone	☐	Dump PLN	☐	Fax	☐	Réponse	☐

Autres pièces jointes :

Etat traitement : EN COURS