

Final Report of the Aircraft Accident Investigation Bureau

concerning the incident (Airprox)

between SWR195Z and TAR485

on 23rd November 2002

on the ground, Zurich Airport

FINAL REPORT

AIR TRAFFIC INCIDENT REPORT (ATIR)

AIRPROX (NEAR MISS)

THIS REPORT HAS BEEN PREPARED FOR THE PURPOSE OF ACCIDENT/INCIDENT PREVENTION.
THE LEGAL ASSESSMENT OF ACCIDENT/INCIDENT CAUSES AND CIRCUMSTANCES IS NO CONCERN OF THE INCIDENT
INVESTIGATION (ART. 24 OF THE AIR NAVIGATION LAW)

The masculine form of names also applies analogously to the feminine form.

PLACE/DATE/TIME On the ground, Zurich Kloten, 23.11.2002,
11:08 UTC

AIRCRAFT SWR195Z, Airbus A319, HB-IPS, Swiss
LEBL - LSZH

TAR485, Boeing B737, TS-IOK, Tunis Air
LSZH - DTTJ

ATC UNIT Aerodrome Control Zurich

AIR TRAFFIC Aerodrome Controller (ADC)

CONTROLLERS Ground Controller (GRO)

AIRSPACE On the ground

HISTORY

During the morning of 23 November 2002 a fog situation prevailed on the airport of Zurich Kloten until just before the incident in question; this made the use of low visibility procedures (LVP) necessary. A few minutes before the incident, however, weather conditions had improved to such an extent that SWR195Z, approaching runway 14 under radar control, was able to make out the runway from 5000 ft/QNH on the right hand base leg. At the same time visibility of the runway from the tower was good. Individual fog patches were still present though these lay beyond the runway system.

During the approach on the runway 14 instrument landing system (ILS) the F/O of SWR195Z, as pilot non flying (PNF), asked the aerodrome controller (ADC) about the possibility of a swing-over to runway 16. At this time the Swiss aircraft was at a distance of approximately 3,1 NM from the threshold of runway 14. The competent aerodrome controller gave clearance for this to the Swiss aircraft, indicating that an aircraft was on take off roll on runway 28. Seventeen seconds after the clearance for the swing-over, SW195Z also received landing clearance for runway 16.

At the moment of issuing landing clearance to SWR195Z the ADC was already involved for several minutes in an extensive dialogue with a previously under instrument flight rules (IFR) departed Cessna 172. These time-consuming radio communications were necessary because the Cessna's transponder was not functioning.

In the meantime, in accordance with a previous clearance from the ADC, the next aircraft scheduled to take off, a Tunisair Boeing 737 flight number TAR485, had aligned itself on runway 28 and had made ready for take-off. 1:25 minutes after SWR195Z had received landing clearance for runway 16, TAR485 received take-off clearance from the ADC for runway 28. At this time SWR195Z was about to touch down on runway 16.

Shortly after touching down on runway 16, the flight crew of SWR195Z became aware of TAR485, which was taking off. The CMD immediately initiated full braking of the Airbus 319. As a result it was possible to bring the Swiss aircraft to a halt about 50 metres north of the shoulder of runway 28. From this standstill position, the flight crew of SWR195Z observed the TAR485 which was taking off low over the runway intersection.

The aerodrome controller, for his part, recognised the potential for collision after he had made sure, by a visual check and a glance at the two overhead monitors, that runway 14 was free for a following machine and he had given landing clearance for runway 14 to this following aircraft. After a brief situation analysis, he concluded that it was too late to issue an instruction for a go-around to SWR195Z (the aircraft had already touched down on the runway) and therefore requested TAR485, which was on its take-off run, to abort its take-off. The Tunisair aircraft was not able to comply with this request.

Both air traffic control (skyguide) and the CMD of the Swiss aircraft subsequently submitted an ATIR.

FINDINGS

- The incident took place in the area of the intersection of runways 16 and 28.
- Both aircraft were in uninterrupted radio contact with the ADC.
- At 11:05:29 SWR195Z asked the ADC: "Any chance for swing, SWR195Z?" and immediately received the reply: "195Z, yes, departure is rolling on runway 28, swing over runway 16 is approved".

All times in this report are in UTC format (Local time – 1 hour)

- Seventeen seconds later, at 11:05:46, SWR195Z received landing clearance for runway 16. The aircraft was now at a distance of approximately 2,6 NM from the threshold of runway 16.
- At 11:07:11 the ADC gave clearance for TAR485 to take-off from runway 28. At this time SWR195Z was about to touch down on runway 16.
- At 11:07:46 the ADC requested TAR485 to abort take-off as follows: "Stop take off, TAR485, stop take off, stop take off!". TAR485 did not respond.
- Four seconds later, SWR195Z indicated: "We stop, SWR195Z". In this way its flight crew indicated that it had realised the danger of a collision and would decelerate their aircraft.
- After take-off, the flight crew of TAR485 stated to the ADC that it had not been possible to stop the take-off at the critical speed of about V1.
- About 10 minutes before the incident, a Cessna 172 (HB-CFO) whose transponder was not functioning was taking off from runway 28 under instrument flight rules. As a result, extensive dialogue took place between the ADC and this aircraft, as well as time-consuming co-ordination procedures with departure control, in order to find as good and efficient a solution to this problem as possible. As a result of the failure of the transponder on that aircraft, a distinct delay built up for subsequent departing traffic. TAR485 and the preceding take-off, SAS602, were particularly affected by this delay. According to the aerodrome controller's statement, these procedures demanded additional attention.
- The CMD of SWR195Z mentioned in his statement that he had expected to bring his aircraft to a halt before the intersection with runway 28. However, in order to achieve this, no-compromise braking was essential, and as a result, the aircraft deviated from the centre line and drifted some three metres to the left.
- According to the estimate of the CMD of SWR195Z, his aircraft "came to a halt about 50 metres before the northern shoulder of runway 28". This estimate corresponds with most of the other statements.
- According to the CMD of TAR485, the ADC instruction to abort the take-off came too late for it to be obeyed. At this time, his aircraft was at decision speed V1. Continuation of the take-off manoeuvre offered the best possibility of avoiding a possible collision on the runway intersection.
- In his statement, the aerodrome controller expressed the opinion that the incident had resulted from the fact that, contrary to his usual habit, he had carried out no manipulation on the TACO (TACO = tower approach coordination – an interactive screen with all approaching and departing flight movements) as a reminder of the approved swing-over.
- Weather: **QAM 10:50 UTC**
Wind: 300°, 04 knots
Ground visibility: 1000 M; R14/P1500U R16/P1500U R28/P1500U
PATCHES OF FOG
Cloud: SCT at 200 FT/GND, BKN at 25,000 FT/GND
Temperature: 04°C, dew point: 04°C
QNH 1010 hPa
BECMG VIS 3000 M

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QAM SPECI 11:03 UTC

Ground visibility: 3000 M
VICINITY FOG
BECMG VIS 5000 M

QAM 11:20 UTC

Wind: 290°, 05 knots
Ground visibility: 5000 M
Clouds: FEW at 200 FT/GND, BKN at 25,000 FT/GND
Temperature: 05°C, dew point: 04°C
QNH 1010 hPa

ANALYSIS**The swing-over landing procedure**

This landing procedure involves aircraft approaching on ILS 14 or 16 changing over to a final visual approach on the respective other runway at short notice. The initiative for such changes to the landing runway frequently comes from flight crews, but may also originate from air traffic control (ATC); the latter applied for swing-over from runway 14 to runway 16 only.

In practice, the ATC is frequently able to approve such runway changes (above all those from runway 14 to runway 16) only if approaching aircraft are at a distance of between three and two NM from the runway threshold.

The procedure is intended to ensure a smooth traffic flow. It is often desired by flight crews who will be parking at stands in the southern part of the airport apron (e.g. at "D" stands). As a result, much shorter taxiing times are achieved. The procedure is recorded in AIP Switzerland under LSZH AD 2-31.

The assignment of this procedure at short notice demands a high degree of flexibility and the greatest attention on the part of ATC and flight crews. In particular, ATC must guarantee that no safety lapses develop in the case of such a short-term change in handling air traffic.

In the present case, the possible increase in efficiency when this procedure was applied was in a unfavourable ratio to the additional risks incurred.

Air traffic control

On that morning until this incident air traffic was handled on two independent runways (landings on runway 14, departures on runway 28). The short-term change to a handling concept with intersecting runways led to a lapse in safety. The competent aerodrome controller, when he issued the take-off clearance for TAR485, was obviously no longer aware that 85 seconds previously he had cleared the approaching SWR 195Z to land on the intersecting runway 16. One factor may have been the fact that shortly before he had been engrossed in a traffic problem (the failure of the HB-CFO transponder) and had not prepared any reminder for the landing runway change which he had authorised at short notice.

SWR195Z and TAR485 flight crews

The reactions of the two flight crews are comprehensible for the successful resolution of this potential collision situation. The attentiveness of the Swiss flight crew allowed them to bring their aircraft to a halt in time. The Tunisair flight crew assessed that the risk to abort their take-off was higher than the continuation of it.

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CAUSE

The incident resulted from the fact that the competent aerodrome controller erroneously cleared TAR485 for take-off, even though shortly before he had cleared the approaching SWR 195Z to land on the intersecting runway 16. The loss of control over air traffic may possibly have been caused by the heavy workload due to an unusual traffic problem which had arisen shortly before.

SAFETY RECOMMENDATION NR. 264

The Federal Office for Civil Aviation (FOCA) should ensure that in principle no swing-over procedures of the type described are used.

SAFETY RECOMMENDATION NR. 265

The Federal Office for Civil Aviation (FOCA) should ensure that the next development stages of the **Swiss Airport Movement Area Control System (SAMAX)** are implemented as rapidly as possible. In particular, immediate implementation of the runway incursion monitoring and conflict alert sub-system – RIMCAS – could make a valuable contribution to avoiding similar incidents.

MEASURES TAKEN

Immediately after the incident, skyguide issued an instruction according to which swing-over procedures are no longer to be implemented.

Berne, 15 September 2004

Aircraft Accident Investigation Bureau

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Transcript of Original Tape Recording

Subject **AIRPROX / RWY Incursion SWR195Z/TAR485 of November 23, 2002**

Call Signs	HNE	→	HB-VNE		
	XQJ	→	HB-XQJ		
	602	→	SAS602	→	Scandinavian
	1531	→	SWR1531	→	Swiss (Swiss Air Lines)
	751V	→	SWR751V	→	Swiss
	1051	→	SWR1051	→	Swiss
	1575	→	SWR1575	→	Swiss
	HFO	→	HB-CFO		
	221	→	MAK221	→	Macedonian Airlines
	1727	→	SWR1727	→	Swiss
	485	→	TAR485	→	Tunis Air
	268	→	V268		
	164Y	→	SWR164Y	→	Swiss
	195Z	→	SWR195Z	→	Swiss
	562	→	Swiss562	→	Swiss
	3464	→	IBE3464	→	Iberia
	683	→	TAR683	→	Tunis Air
	5525	→	DLH5525	→	Lufthansa
	ADC	→	Zurich Tower		

Frequency Zurich Tower 118.10 MHz

The signer certifies the completeness of the present transcript

skyguide
Flugsicherungsbetrieb Zürich

ZZY

sig. Franz Fischbach

To	From	Time UTC	Communication	Observation/various 2
ADC	HNE	10:57:51	Zurich Tower, HB-VNE, established ILS 14	
HNE	ADC	:54	HB-VNE, Zurich Tower, servus, number two	
ADC	HNE	:59	Ja	
HQJ	ADC	:58:09	Helicopter XQJ, do you still read me?	
ADC	602	:20	Zurich, good afternoon, SAS602	
602	ADC	:25	SAS602, Zurich Tower, good afternoon, line up runway 28 and wait	
ADC	602	:30	Line up 28 and wait, SAS602	
HNE	ADC	:33	H-NE, wind 310 degrees, 4 knots runway 14, cleared to land	
ADC	HNE	:37	HNE, cleared to land runway 14	
ADC	1531	:41	Tower, "guete morge" SWR1531, ten miles 14	
1531	ADC	:44	1531, hallo	
751V	ADC	:46	SWR751V, taxiway Foxtrot, straight in, contact Apron 12175	
ADC	751V	:50	Cleared to cross 28, 12175, SWR751V	
1051	ADC	:55	SWR10.....51, via Hotel 2 right Delta Echo, 12185	
ADC	1051	:59	Hotel 2 right Delta, 121 decimal 85, SWR1051	
1531	ADC	:59:05	SWR1531, "grüezi", number 2	
ADC	1575	:28	Zurich, SWR1571 holding short 28	
1575	ADC	:32	SWR1575 on taxiway Foxtrot, cross runway 28, contact Apron 12175, servus	
ADC	1575	:39	On Foxtrot cross 28, then over to Apron, adie, 12175	
ADC	HFO	:54	HF, "äh", climbing up, and could we change to 12595?	
HFO	ADC	11:00:00	HFO, first switch on the transponder please, on squawk 1413	
ADC	HFO	:07	HFO, 1413	
1531	ADC	:51	SWR1531, wind three hundred degrees, 5 knots runway 14, cleared to land	
ADC	1531	:57	Cleared to land 14, SWR1531	
HFO	ADC	:01:02	HFO, switch on 1413, please	
ADC	HFO	:06	HFO, 125.95?	
HFO	ADC	:08	Negativ, not the frequency, you should switch on the transponder squawk 1413	
ADC	HFO	:14	Okay, FO, 1413 is coming down	

To	From	Time UTC	Communication	Observation/various 3
HNE	ADC	11:01:18	HNE, taxiway Hotel 1, Hotel Bravo, hold short of 28 and Bravo	
ADC	HNE	:22	HNE, via Hotel Hotel 1, holding short "äh" Bravo	
1051	ADC	:28	SWR1051, hallo again, on Foxtrot, cross 28, Apron 12175	
ADC	1051	:32	Okay, cross runway 28, 12175, SWR1051	
602	ADC	:38	SAS602, I call you back in a few minutes, I have Cessna 172, IFR, low performance on the SID	
ADC	602	:48	Standing by, SAS602	
602	ADC	:51	I'm not allowed to vector below five thousand, that's the reason	
221	ADC	:54	MAK221, wind three hundred degrees, 4 knots runway 16, you are cleared for take off	
ADC	221	:02:04	Cleared for take off runway 16, MAK221	
ADC	1727	:08	Tower "guete tag", SWR1727, coming 6 miles, looking for a swing	
1727	ADC	:12	SWR1727, Zurich Tower, hallo, I call you back two miles	
HFO	ADC	:20	HFO, I still have no transponder read out, what is your altitude?	
ADC	HFO	:25	HFO, four thousand two hundred climbing, "äh" 45 point 4 miles from DME Kloten	
HFO	ADC	:32	Roger, squawk 1413	
ADC	HFO	:36	HFO, still on	
ADC	485	:45	Tower, TAR485, bonjour	
485	ADC	:52	TAR485, hallo, we had the Scandinavian line up* *unreadable behind	
ADC	485	:03:04	Behind Scandinavian line up 28, TAR485	
HFO	ADC	:12	HFO, your transponder seems not to be working, are you able to continue VMC to the city?	
ADC	HFO	:19	HFO affirm	
HFO	ADC	:21	Okay, please do so and could you then cancel IFR?	
ADC	HFO	:26	Affirm	
221	ADC	:31	MAK221, contact Departure, good bye	
ADC	221	:36	Departure, MAK221, good bye	
HFO	ADC	:38	HFO, "äh" maintain 4000 feet about	
ADC	HFO	:44	HFO, 5000, leaving now to descend to 4000	

To	From	Time UTC	Communication	Observation/various 4
HFO	ADC	11:03:48	Yes please, and report passing "äh" I have you as a primary target and please let me make it know, that your transponder is not working	
ADC	HFO	:58	HO "äh" FO	
ADC	?	:04:10	Tower "grüezi" *	* 2 stations speaking
ADC	1727	:10	1727, 2 miles	
1727	ADC	:16	1727 continue	
ADC	1727	:19	Okay	
ADC	1531	:22	SWR1531, is on Delta	
1531	ADC	:24	1531, Apron 12185, adie	
ADC	1531	:27	Adie	
ADC	268	:28	V268, approaching Rüti, 3000 feet, changing, good bye	
268	ADC	:30	Danke, V268, to change approved, adie	
ADC	268	:33	adie	
ADC	164Y	:37	Zurich Tower, "guete Tag", SWR164Y, established ILS 14, 8 miles	
164Y	ADC	:44	SWR164Y, hallo, number three	
ADC	1727	:47	1727, short final 14	
1727	ADC	:50	I confirm, cleared to land, 1727, 310 degrees, 5	
ADC	1727	:52	Cleared to land 14, SWR1727	
ADC	195Z	:55	Tower, grüezi, SWR195Z, established 14	
195Z	ADC	:58	SWR195Z, grüezi, number two	
602	ADC	:05:00	SAS602, wind 290 degrees, 6 knots, runway 28, cleared for take off	
ADC	602	:05	Cleared for take off 28, SAS602	
ADC	195Z	:25	Any chance for swing, SWR195Z	
195Z	ADC	:29	195Z, yes, departure is rolling on runway 28, swing over runway 16 is approved	
ADC	195Z	:36	Swing over 16 is approved, SWR195Z, merci	
HNE	ADC	:40	HNE, I call you back in a minute	
ADC	HNE	:44	HNE	
195Z	ADC	:46	SWR195Z, wind 310 degrees, 5 knots, runway 16, cleared to land	
ADC	195Z	:51	Cleared to land 16, SWR195Z	
1727	ADC	:54	SWR1727, right into Delta, Apron 12185	

To	From	Time UTC	Communication	Observation/various 5
ADC	1727	11:05:58	Right into Delta, over to Apron, SWR1727	
1727	ADC	11:06:01	Sorry for delay landing clearance	
ADC	1727	:04	No problem	
ADC	HFO	:05	HFO, city, leaving your frequency	
HFO	ADC	:08	And confirm your altitude please	
ADC	HFO	:10	HFO, 4000	
HFO	ADC	:12	Could you just check and you are going now VFR to Friedrichshafen, is that correct?	
ADC	HFO	:16	HFO, that's correct	
HFO	ADC	:19	Thank you, you may leave this frequency, IFR flight cancelled is 06. adie	
ADC	HFO	:25	HFO, "uf wiederluege"	
ADC	1531	:28	Zurich Tower, SWR1531, holding short of 28	
1531	ADC	:34	SWR1531, hallo, cross 28 on FOX, contact Apron on 12175	
ADC	1531	:39	Crossing 28 on Fox, Apron 12175, SWR1531, good bye	
562	ADC	:42	SWR562, hallo, hold short of 28	
ADC	562	:46	SWR562, holding short runway 28, "grüezi"	
ADC	3464	:50	Zurich, IBE3464	
3464	ADC	:52	IBE3464, hallo, number 3	
602	ADC	:54	SAS602, contact Departure, adie	
ADC	602	:58	Contact Departure, SAS602, bye bye	
ADC	683	:07:02	Zurich Tower, good morning, TAR683, in sequence	
683	ADC	:07	TAR683, hallo, Departure in about 7 minutes	
ADC	683	:10	Thank you	
485	ADC	:11	TAR485, wind 290 degrees, 5, runway 28, cleared for take off	
ADC	485	:16	Cleared for take off, TAR485	
ADC	5525	:20	Zurich, DLH5525, behind the SWR Avroliner, fully ready and we "äh" for departure in sequence	
5525	ADC	:27	DLH5525, hallo	
ADC	164Y	:31	SWR164Y, 2 miles	
164Y	ADC	:34	continue	
164Y	ADC	:40	SWR164Y, wind 310 degrees, 5 knots, runway 14, cleared to land	

To	From	Time UTC	Communication	Observation/various 6
ADC	164Y	11:07:44	Cleared to land, SWR164Y	
485	ADC	:46	Stop take off, TAR485, stop take off, stop take off	
ADC	195Z	:50	We stop, SWR195Z	
ADC	195Z	:08:06	And confirm, we have been cleared to land 16, SWR195Z	
195Z	ADC	:09	Affirm, but the other one is not been cleared for take off, "äh", turn next left, on Echo 7	
ADC	195Z	:14	Next left, Echo 7, SWR195Z, we have him seen rolling	
ADC	1727	:23	Tower "grüezi", SWR1727	
485	ADC	:27	TAR485, contact Departure, good bye*	*change controller
ADC	485	:33	bye	
ADC	485	:35	TAR485, impossible for us around the V1 to stop take off, sorry	
485	ADC	:48	485 roger	
ADC	1727	:51	And Tower, SWR1727, holding short 28 on Fox	
1727	ADC	:53	SWR1727, taxiway Foxtrot, cross runway 28, call Apron 121 decimal 75	
ADC	1727	:59	12175, crossing 28 on Fox, SWR1727	
195Z	ADC	11:09:03	SWR195Z, next left, Echo 7, Apron 121 decimal 75	
ADC	195Z	:08	Next, Echo 7, 12175, SWR195Z, and we have to write an ATIR	
195Z	ADC	:14	Yes, we know, we are organize and we are listening to the tape recorder and, äh, you wish to call the Tower later on?	
ADC	195Z	:26	Negativ, we just write the report	
195Z	ADC	:30	Thank you	

- end -

Src
APN

Analysis: Incident SWR195Z/TAR485 23.11.02 Time [UTC]: 23.11.2002 11:07:23



11:05:25
a25
11:05:29
a24
11:05:37
a24
11:05:45
a24
11:05:53
a23
11:05:49
a23
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a22
11:06:01
a22
11:06:05
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a16
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a16
11:07:02
a15
11:07:06
a15
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a14
11:07:14

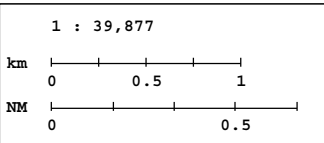
11:05:29 "195Z, yes, departure is rolling on RWY28, swing over RWY16 is approved"

11:05:46 "SWR195Z, wind 310° 5 kt, RWY16 cleared to land"

11:05:25
"any chance for swing, SWR195Z ?"

11:05:36
"swing over 16 is approved, SWR195Z, merci"

120
SWR195Z
a14 EKR
M



Name: Bettina Comte sg-zzda Eval Date: 28.11.2002