**Federal Department of the Environment,
Transport, Energy and Communication** **N° 1755**

Final Report
of the Aircraft Accident
Investigation Bureau

concerning the incident

to the airplane Mc Donald Douglas MD 83, OH- LPH, Finnair
on 15 april 2000
at Zurich Airport

Bundeshaus Nord, CH-3003 Bern

URSACHE

Der Vorfall wurde verursacht durch einen erhöhten elektrischen Widerstand auf einem Kontakt der Verbindung zwischen der Luftfahrzeugverdrahtung und dem speziellen Verbindungskabel (P/N C773-10-450) zum Vorschaltgerät.

Aufgrund der Zunahme des Widerstandes erhöhte sich die Temperatur, was zu „elektrischem Geruch und Rauch“ führte.

Aircraft Accident Investigation Bureau

FINAL REPORT

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

AIRCRAFT	Mc Donald Douglas MD 83			OH- LPH	
OPERATOR	Finnair, Helsinki Airport, FI-01053 Finnair				
OWNER	Finnair, Helsinki Airport, FI-01053 Finnair				

PILOTS	PIC:	Finnish citizen, 1956			
	COPI:	Finnish citizen, 1956			
FLIGHT EXPERIENCE (PIC)	**Total**	7'427	**In the previous 90 days**	90	
	On accident type	1'892	**In the previous 90 days**	90	
FLIGHT EXPERIENCE (COPI)	**Total**	6'629	**In the previous 90 days**	172	
	On accident type	1'587	**In the previous 90 days**	172	

PLACE	Zurich Airport
DATE AND TIME	15 April 2000, 17:49 UTC

TYPE OF FLIGHT	Commercial scheduled flight / Finnair Flight 864X
PHASE OF FLIGHT	Initial Climb
TYPE OF INCIDENT	Smoke in cabin

INJURIES TO PERSONS

	Crew	**Passengers**	**Others**
Fatal	---	---	---
Serious	---	---	---
None	6	60	

DAMAGE TO AIRCRAFT	Burned connector in Hatrack
OTHER DAMAGE	---

History of flight

During initial climb and turn to ZUE, the cabin crew reported a fire in the hatrack. The crew decided to return immediately to Zurich where they made a successful landing.

Nobody was hurt during the disembarkation of the plane.

Investigation

The ACC of Zurich informed the Swiss Federal Aircraft Accident Bureau about the incident.

An investigation according to ICAO Annex 13 was opened on the same day. The crew was interrogated in Zurich and the technical investigation was done under supervision of SR-Technics together with maintenance staff of the operator.

AIB Finland nominated an accredited representative and an advisor to him for this investigation.

During the investigation Cockpit Voice Recorder (CVR) was transferred to Berne for the readout. The transcript was done with the assistance of the accredited representative of AIB Finland and a representative of Finnair.

The removed connector was investigated.

Findings

- All crew members held valid licences.
- The aircraft had no story of smell or smoke.
- After discharging the “Halon” extinguishers, the smoke has ceased.
- After opening of the ceiling panel above hat rack row 18 RH, the access door to the sidewall light ballast was opened. The connector on the a/c side wiring was found burned. (Fig. 1)
- The connector was removed for investigation.
- The external housing of the female and male part of the connector did not show signs of external heat damage. (Fig. 2)
- The connection between wire and contact did not show thermal damage and had a firm seat.
- In the socket part of the connector, at contact “A”, there was a melted pearl of metal. (Fig. 3)
- Otherwise in the pin part of the connector, the forward part of pin “A” is missing.
- The copper of the remaining pin “A” shows a strong blistering, which indicated high temperatures normally obtained through an electric arc. (Fig. 4)

Analysis

The decision of the cockpit crew to return to Zurich for landing was appropriate. The crew’s decision to proceed to RWY 16 and perform a normal landing and disembarkment of the passengers therefore was a good choice.

The burned connector was analyzed. From Finnair Maintenance, the statement was, that condensed water trapped in the connector could have resulted in an increase in current between two contacts (sneak current).

Due to the found increase in temperature that was produced at pin “A” and was of such a nature, that an increase in resistance is suspected as a cause and not the presence of humidity in the connector.

This increase in resistance can result from a mechanically damaged pin or a malformed pin with a shaving. In this case, the current which has to pass will heat up the reduced remaining section and in case of AC- current may produce an arc. This arc will melt the copper as found in the burned connector.

Cause

The incident was caused by an increased electrical resistance on a contact of the connector between the a/c wiring and the special interconnect cable (P/N C773-10-450) to the ballast.

Due to the increase in resistance, there was a temperature increase leading to an "electrical smoke".

Berne, 21 November 2002

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Annexe 1

Fig. 1

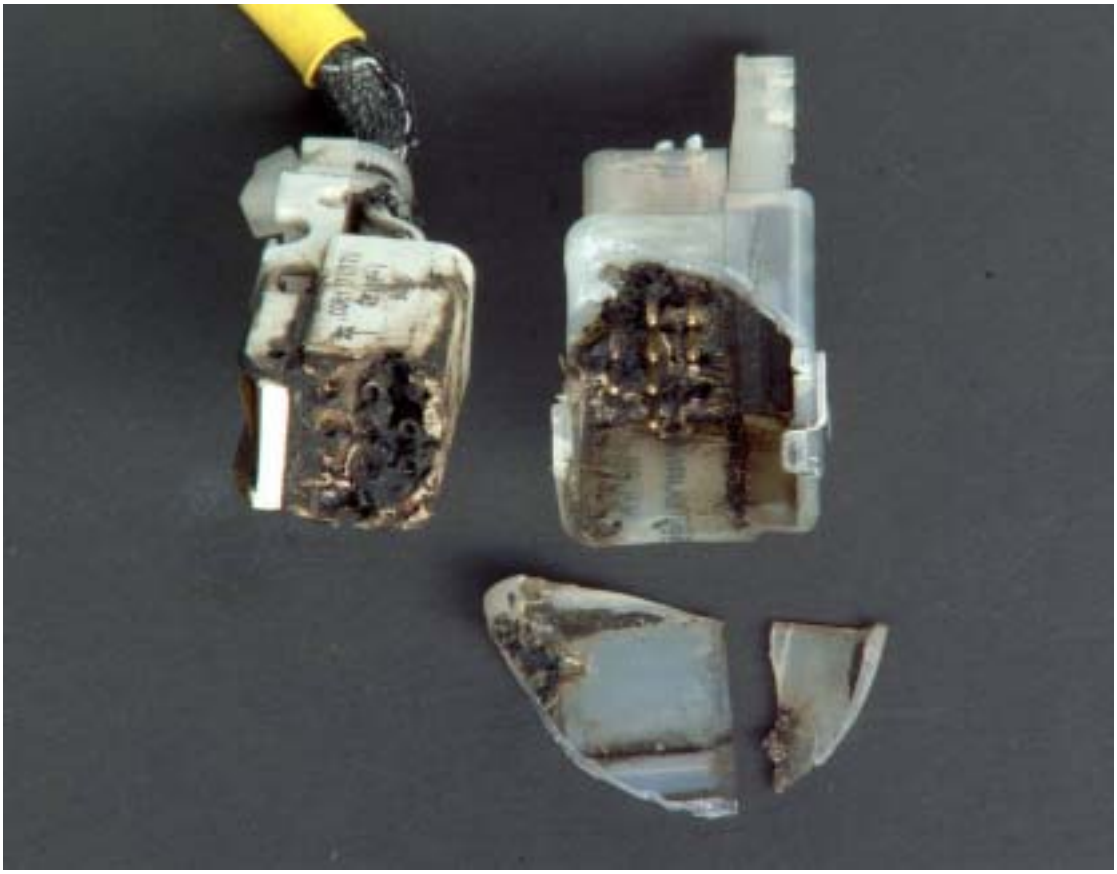

Fig. 2

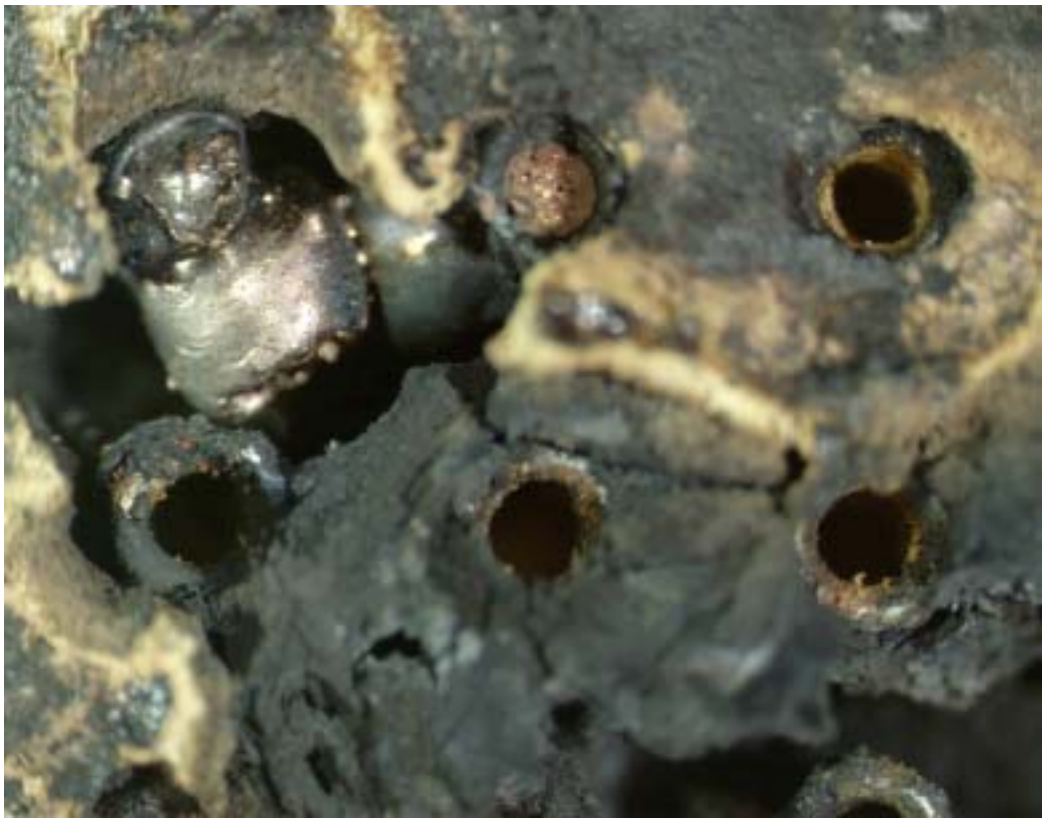

Fig. 3

Fig. 4