DOCKET NO. SA-510

EXHIBIT NO. 11A

NATIONAL TRANSPORTATION SAFETY BOARD

MAINTENANCE RECORDS GROUP CHAIRMAN'S REPORT

DOCKET NO. SA-510

NATIONAL TRANSPORTATION SAFETY BOARD
SOUTH CENTRAL REGION
ARLINGTON, TEXAS 76011

OCTOBER 14, 1994

MAINTENANCE RECORDS GROUP CHAIRMAN'S FACTUAL REPORT

A. ACCIDENT: DCA-94-MA-076

Location: Aliquippa, Pennsylvania
Date: September 8, 1994
Time: 1904 Eastern Daylight Time
Airplane: Boeing 737-300, N513AU

B. GROUP IDENTIFICATION

The Maintenance Records Group convened at USAir maintenance hangar number 3 (Room 212), at the Pittsburgh Airport, on September 9 through 13, 1994. A partial group was reconvened in room 229 of the same building on November 1-2, 1994 to reexamine or review documents in support of the wreckage reconstruction efforts. The operator presented all of the requested historical, maintenance, and pertinent records for the accident aircraft. The following group members participated as parties to the investigation and were assigned to the Maintenance Records Group:

Chairman: Hector R. Casanova
Air Safety Investigator
National Transportation Safety Board
Arlington, Texas 76011

Members: Kurt Anderson
Air Safety Investigator
National Transportation Safety Board
Seattle, Washington 98188

John Goglia
Chairman, Flight Safety Committee
Int'l Association of Machinist and Aerospace Workers
Saugus, Massachusetts 01906

Daryl Hartzell
Senior Director, Maintenance Control
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Manager, Technical Records and Airworthiness
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Daniel Sicchio
Central Safety Committee Member
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Pennellville, New York 13132

Charles P. Tarker
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Cincinnati, Ohio 45215

C. SUMMARY

On September 8, 1994, at 1904 Eastern Daylight Time, USAir flight 427, a Boeing 737-300, N513AU, crashed while maneuvering to land at Pittsburgh International Airport, Pittsburgh, Pennsylvania. The airplane was being operated on an instrument flight rules (IFR) flight plan under the provisions of Title 14, Code of Federal Regulations (CFR), Part 121, on a regularly scheduled flight from Chicago-O'Hare International Airport, Chicago, Illinois, to Pittsburgh. The airplane was destroyed by impact forces and fire near Aliquippa, Pennsylvania. All 132 persons on board the airplane were fatally injured.

D. DETAILS OF INVESTIGATION

1. USAir Maintenance Program

The Federal Aviation Administration (FAA) approved the USAir maintenance program to conduct operations under Part 121 under certificate number USAA105A in accordance with the continuous airworthy maintenance program and limitations specified in Part D of their operations certificate.

USAir is authorized to use a continuous airworthiness maintenance program for their Boeing 737 fleet. The maintenance time limitations for the Boeing 737 are:

Wheel/Oil Check-To be accomplished once every operating day.

Transit Check -To be accomplished every 35 hours/7 calendar days.

"A" Check -To be performed at a time in service not to exceed 200 hours.

"B" Check -To be performed at a time in service not to exceed 1150 hours.

"C" Check -To be performed at a time in service not to exceed 4600 hours. The "C" check is broken down into four visits at 1,150 hour intervals.

"Q" Check -To be performed at a time in service not to exceed 11,000 hours or 42 months. The initial "Q" Check is not required until 20,000 hours or 80 months. The "Q" Check is an approved alternative to the structural inspection ("D" Check).

The USAir maintenance information system is a computer based maintenance tracking system in which all maintenance discrepancies and associated corrective actions are recorded and tracked. Maintenance information can be tracked and retrieved by airplane number, date, and ATA code.

2. Aircraft Records Review

All maintenance entries for N513AU from June 2, 1994 to September 8, 1994 were reviewed in detail. The following five maintenance carryover items (OM-7) were noted:

1) Dent in left aft inboard flap assembly.
2) Aisle floor adjacent to row number 5 soft and spongy. (Interim repair was performed).
3) Attaching mount bushing worn on thrust reverser "C" duct for the right engine.
4) Right engine, lower left and right "C" duct sliders worn 30 to 49 percent when the thrust reverser is in the deployed position.
5) Left engine, lower left and right "C" duct sliders worn 30 to 49 percent when the thrust reverser is in the deployed position.

Maintenance records from the computerized data base from April 1, 1994 thought the date of the accident for ATA code 27 (flight control), ATA code 28 (fuel systems), ATA code 29 (hydraulics), ATA code 32 (landing gear), ATA oode 51 (structures),

and ATA code 78 (exhaust/thrust reversers) were reviewed and retained.

The work cards for the last four "C" Checks and the last structural inspection ("Q" Check) were reviewed in detail. No discrepancies were found.

Reviewed engine conditioning monitoring (ECM) data on engine parameters for both engines. Data reviewed included all flights from July 31, 1994, up to, and including the last flight from Chicago as flight 427. No engine anomalies were found in the ECM data.

Maintenance records showed that the rudder functional checks required by AD 94-01-07 were performed three times in 1994. The initial check was performed per Production Control Item (PCI) 1734 on March 21, 1994 in accordance with USAir campaign directive 27X00663 at 22,368 hours/13,511 cycles. A repetitive inspection was performed per PCI 1735 on June 14, 1994, in accordance with USAir Job Card J227-00-2, at 23,100 hours/13,994 cycles. The most recent repetitive inspection was accomplished in Tampa, Florida, per PCI 1863 on August 8, 1994, in accordance with USAir Job Card J227-00-3 at 23,572 hours/14,298 cycles. Terminating action (PCU replacement) for the AD was scheduled for March 3, 1999.

The aircraft was serviced with Skydrol LD4 hydraulic fluid manufactured by Monsanto. The replacement and sampling interval for the hydraulic fluid and the filters used in the A, B, and Standby hydraulic systems was reviewed. The aircraft manufacturer maintenance manual does not recommend any specific interval for the sampling or replacement of the hydraulic fluid during the life cycle of the aircraft. The interval for fluid sampling or replacement is to be established by the operator based on the aircraft operational environment. The operator's maintenance program does not have a requirement to sample or replace the hydraulic fluid in the systems. Likewise, it was found that there was no requirement from the engine manufacturer to sample the engine oil on the CFM56 engines.

Pressurized hydraulic fluid for each pump is filtered by a 15 micron non-bypassing filter. The manufacturer's Maintenance Planning Document (MPD) recommends filter replacement at the "C" check interval.

The operator's maintenance program was found to be consistent with the manufacturer's recommendations for the replacement of hydraulic filters, with the exception of the following filters:

1) A & B Ground Service Disconnect filters. (MPD B29-15-08-4A)
2) Power Transfer Unit (PTU) pres. filter. (MPD B29-22-21-2A)
3) Standby System pressure filter. (MPD B29-15-81-2A)

Following the accident, the operator issued three separate campaign directives (CD) for a one time removal and replacement of the above referenced filters prior to December 31, 1994.

Inlet filters for the Power Control Units (PCU) for the flight control surfaces are not replaced at any specific intervals, and are replaced on an "on-condition" basis during component overhaul.

The interval for the replacement of hydraulic filters on portable hydraulic test stands (mules) utilized at USAir's major hubs was reviewed. The manufacturer of the equipment does not have specific intervals for replacement of the filters. There was no evidence to support that the filters are changed at any specified intervals.

The results of the last inspection (transit check) conducted at Hartford, Connecticut, on September 8, 1994, were reviewed. No discrepancies were noted by maintenance personnel during this inspection.

The records audit indicated that, at the time of the accident, all outstanding Federal Aviation Administration Airworthiness Directives had been complied with. It was also determined that there were no outstanding Minimum Equipment List (MEL) items at the time of the accident.

All maintenance records on major repairs and modifications performed since manufacture were reviewed. No inconsistencies were found with either; however, it was noted that the aircraft was modified by the installation of the thrust reverser sync lock system. This system was designed to further minimize the possibility of deployment of the thrust reversers in flight. Boeing Service Bulletin 737-78-1053 provided for the installation of the modification, which was completed on February 4, 1994. Boeing issued Service Letter 737-SL-78-26 advising all 737 operators to deactivate the sync lock system. The aircraft was unmodified in accordance with USAir engineering authorization # 18477 on February 5, 1994. Both the modification and the de-modification were completed during the same maintenance visit. The wiring harness remained installed (capped and stowed).

The documentation pertaining to the deactivation of the Patrick Aircraft Tank System (PATS) auxiliary fuel tank was reviewed. The PATS was deactivated on January 10, 1994 as per USAir Engineering Order (EO) 7193H497. The same EO modifies the wiring configuration in the flight management computer system (FMCS) for the modification of the engines for operation at 20,000 pound thrust levels. The tank was deactivated as per the manufacturer's "long term procedure"; however, the tank and all associated hardware remained installed in the airplane.

The service history of the tires and wheels installed on the airplane was reviewed and their serial numbers were provided to the requesting groups. Serial numbers are assigned at the time the tires are recapped. The left outboard tire on this airplane was new and therefore was not assigned a serial number.

Reviewed the list of the operator's mechanical interruptions between January 1989 and September 1994. Four documented mechanical interruptions were recorded: They were an aft cargo door illumination (10/30/94); A defective variable bleed valve actuator motor on the number two engine (02/07/93); An out of adjustment roll guide on the forward entry door (03/18/93); and the number one engine failing to reach takeoff power which resulted in the replacement of the autothrottle computer (04/17/93). Likewise, the manufacturer's records of maintenance events leading to scheduled interruptions or delays (over 15 minutes) was reviewed. A total of 171 delays or interruptions were recorded since the aircraft was delivered to USAir in 1987.

The group also reviewed the operator's maintenance management program documents. They were approved by the FAA and all of the maintenance documentation on the accident airplane was found to be in compliance with the program and established procedures.

The effectiveness of the FAA surveillance program was also reviewed. USAir maintenance management personnel, as well as FAA personnel directly involved with the airline were interviewed regarding the relationship and effectiveness of the program. Many examples of good working relationship and teamwork were cited on both sides. Noteworthy are the monthly meetings held between airline QA personnel and FAA personnel to discuss and solve items of mutual interest or concern. Two-way communication was found to be open and responsive. No shortcomings were found.

The logbook from N513AU was recovered from the wreckage. The group reviewed the logbook pages for the day of the accident. It was noted that the flight crew did not make any entries on the logbook prior to the accident.

3. Statistical Data

Aircraft

Model:	Boeing 737-3B7 (S/N: 23699)
Date Mfg:	October 8, 1987
Registration:	N513AU (delivered as N382AU)
Total time:	23,846 hours
Total cycles:	14,489 cycles

INSPECTION	DATE	STATION	TIME SINCE LAST
Wheel/Oil Check	09/07/94	CLT	18:34
Transit Check	09/08/94	BDL	5:44
"A" Check	08/25/94	ALB	133:26
"B" Check	05/19/94	BOS	1,008:25
1/4 "C" Check (C-12)	07/20/93	TPA	433:25
"Q" Check (A-4)	02/03/93	CLT	5,164:59

Engines

CFM56-3B1

Position	Serial Number	Installed	TSLV	CSLV	Total Time
No. 1	725150	08/11/93	3,462	2,160	13,880
No. 2	720830	07/08/93	3,789	2,340	16,810

Shop Visits

No. 1 1ST. 08/19/92 at 9,305 hours. Reason: Combustor crack
2ND. 05/28/93 at 10,418 hours. Reason: #4 bearing fail.

No. 2 1ST. 11/09/89 at 1,291 hours. Reason: Engine Stall
2ND. 04/03/93 at 13,021 hours. Reason: Performance (EGT).

Hector R. Casanova
Air Safety Investigator