NATIONAL TRANSPORTATION SAFETY BOARD
OFFICE OF AVIATION SAFETY
WASHINGTON, D.C. 20594

December 8, 1995

MAINTENANCE RECORDS GROUP CHAIRMAN'S FACTUAL REPORT

NTSB ID No.: DCA-95-MA-054

A: ACCIDENT

Location:	Carrollton, Georgia
Date:	August 21, 1995
Time:	12:53 Eastern Daylight Time (EDT)
Airplane:	Embraer EMB-120RT, N256AS, Atlantic Southeast Airlines, Flight No. 7529

B. MAINTENANCE RECORDS GROUP

Gordon J. Hookey Group Chairman	National Transportation Safety Board Washington, D.C.
Hurley Perry	Federal Aviation Administration Atlanta, Georgia
Melvin Taylor	Federal Aviation Administration Atlanta, Georgia
Glenda Gibbs	Atlantic Southeast Airlines Macon, Georgia
Robert Mueller	Air Line Pilots Association Dallas, Texas

C. SUMMARY

On August 21, 1995, at about 1253 eastern daylight time (EDT), an Embraer EMB-120RT, N256AS, airplane operated by Atlantic Southeast Airlines (ASA) crashed after departing the Atlanta Hartsfield International Airport (ATL), Atlanta, Georgia. The flight was a scheduled passenger flight carrying 26 passengers and a crew of three operating under the provisions of Title 14 Code of Federal Regulations (CFR) Part 135. The flight was operating in accordance with instrument flight rules (IFR). While

climbing through 18,000 feet, the flightcrew declared an emergency and initially attempted to return to Atlanta. The pilots advised they were unable to maintain altitude and were vectored toward West Georgia Regional Airport, Carrollton, Georgia for an emergency landing. The airplane continued descent until ground impact. The airplane was destroyed by impact forces and postcrash fire. The captain and four passengers received fatal injuries.

D. DETAILS OF THE INVESTIGATION

The on-site investigation of the airplane wreckage revealed one of the four propeller blades on the left propeller assembly, a Hamilton Standard Model No. 14RF-9, was fractured transversely approximately 13 inches from the blade butt end. Examination of the fractured blade by an NTSB metallurgist at the NTSB laboratory in Washington, D.C. confirmed a fatigue fracture from the taper bore progressing outward.

The maintenance records review included an examination of the logbooks and records for the aircraft,engines, and propellers; maintenance activity on the aircraft and left propeller, repair records for the fractured propeller blade; and Hamilton Standard Service Bulletins and Federal Aviation Administration (FAA) airworthiness directives (ADs) applicable to the 14RF-9 propeller.

The Maintenance Records Group convened on August 23, 1995 at the FAA Atlanta, Georgia Flight Standards District Office (FSDO) to review ASA's records for the Embraer EMB-120RT airplane, Registration No. N256AS and the installed Pratt & Whitney of Canada PW118 engines and Hamilton Standard 14RF-9 propellers. The Group also met at ASA's Macon, Georgia maintenance facility on August 24, 1995 to review additional maintenance records.

ASA EMB-120RT airplane, N256AS, had been assigned to ASA's Dallas-Ft. Worth, Texas hub up until about one week prior to the accident. The airplane was transferred to ASA's Atlanta hub in preparation for a 'C' check which was to have been accomplished at the Macon maintenance facility. The records for N256AS were maintained by ASA's Texarkana, Arkansas maintenance facility and were shipped to the FAA's Atlanta FSDO immediately following the accident per the FAA's request. The records from Texarkana which had been delivered to the Atlanta FSDO were taken to ASA's Macon maintenance facility and left in the custody of ASA's Record Supervisor who is a Group Member.

1.0 AIRPLANE HISTORY

Model:	Embraer EMB-120RT
Serial No.:	120122
Date of Manufacture:	March 1, 1989
Date of Delivery:	March 3, 1989
Total Time:	17151.3[1]
Total Cycles:	18171[2]

2.0 ENGINE HISTORY

The engines installed on N256AS were Pratt & Whitney of Canada (PWC) PW118 turboprops, rated at 1,800 shaft horsepower (shp).

Position	No. 1 (left)	No. 2 (right)
Serial No.	115087	115305
Total Time	21538.2	15292.9
Total Cycles	21432	16300
Time since O/H[3]	6679.5	4352.8
Cycles since O/H	6479	4434
Time since HSI[4]	2470.4	N/A
Cycles since HSI	2506	N/A

The No. 1 (left) engine, SN 115087, was last overhauled by Ryder-Aviall, Dallas, Texas on November 17, 1992. The engine was removed from ASA EMB-120 airplane, Registration No. N233AS, No. 1 (left) position on August 9, 1994, for high high pressure turbine rotor speed (Nh) and had a hot section inspection accomplished by ASA at Macon, Georgia on September 16, 1994. Following the HSI, the engine was installed on N256AS on September 18, 1994.

The No. 2 (right) engine, SN 115305, was last overhauled by PWC, St. Hubert, Canada on October 25, 1993. Following the overhaul, the engine was installed on N256AS on December 27, 1993.

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[1] All times and cycles listed are as of 8/20/95 and do not include any flights on 8/21/95.

[2] A cycle is defined as one flight which would include one takeoff and one landing.

[3] Overhaul

[4] Hot section inspection

3.0 PROPELLER HISTORY

Position	No. 1 (left)	No. 2 (right)
Part number	780100-8	780100-8
Serial number	900407	860703
Total time	11422.5	19516.0
Total cycles	11562	20413
Time since overhaul	7252.7	4158.0
Time since installation	7252.7	3958.0
Cycles since installation	7519	4225

Blade No. 1

Part No.	RFC11M2-6A+B	RFC11M1-6A
Serial No.	851653	874892
Time since O/H	515.3	6829.4
Time since installation	515.3	3547.8
Cycles since installation	525	3408
Date of installation	June 12, 1995	April 21, 1994 A.D. 95-05-03D C/W[5]

Blade No. 2

Part No.	RFC11M1-6A	RFC11M1-6A+C
Serial No.	861398	861950
Time since O/H	BROKEN BLADE	1907.6
Time since installation	Refer to	1907.6
Cycles since installation	Section 4.1	1946
Date of installation		Dec. 2, 1994

Blade No. 3

Part No.	RFC11M1-6A+B	RFC11M1-6A
Serial No.	867601	855120
Time since O/H	971.7	7079.4
Time since installation	515.3	4158.0
Cycles since installation	525	4225
Date of installation	June 12, 1995	Jan. 26, 1994

[5] Complied with

Blade No. 4

Part No.	RFC11M1-6A	RFC11M1-6A+B
Serial No.	852549	867998 *
Time since O/H	8218.6	1907.6
Time since installation	3719.6	1907.6
Cycles since installation	3763	1946
Date of installation	Mar. 29, 1994	Dec. 2, 1994
	A.D. 95-05-03D C/W	

* A serial number discrepancy was found to exist in the records for the No. 2 propeller, blades No. 2 and 4. Serviceable tags (yellow) were checked and the serial numbers matched to serial numbers recorded from the blades installed on the airplane. The discrepancy was due to an administrative error.

4.0 FRACTURED PROPELLER BLADE

4.1 HISTORY

Propeller blade PN RFC11M1-6A SN 861398 was manufactured by Hamilton Standard in 1989. The blade was installed on propeller assembly PN 780100-8 SN 890625 which was shipped to Embraer on June 16, 1989. The blade's total time and time since overhaul is 14728.3 and 5182.3 hours, respectively. Following the inspection and repair of the taper bore, the blade was installed on airplane N256AS on September 30, 1994 and had accumulated 2398.5 hours and 2425 cycles. A copy of the serviceable tag is attached, Attachment 1.

4.2 MAINTENANCE HISTORY

The propeller blade was returned to Hamilton Standard, East Windsor, Connecticut for overhaul on March 16, 1993 at a total time of 9546.2 hours. The overhaul limit for 14RF-9 blades is 9500 hours. ASA is permitted, by the airline's operations specification and approved by the FAA, an overfly extension, also known as a short term escalation, of 10% of the overhaul limit not to exceed 500 hours. The blade's shop traveler shows only routine inspections and repairs were accomplished during the overhaul; a dye check of the butt and shank; tap test; replacement of the erosion sheath, internal heater erosion film, heater lead, and teflon strip; balancing; repainting; and stencilling. The overhaul was completed on April 7, 1993. A copy of the shop traveler for the blade is attached, Attachment 2.

On May 19, 1994, the blade received an ultrasonic inspected of the taper bore by a Hamilton Standard contract inspector in accordance with AD 94-09-06 and rejected for a 60% full scale height (fsh) indication. A copy of the May 19, 1994

ultrasonic inspection results is attached, Attachment 3. At the time of the inspection, the blade was installed on ASA EMB-120 airplane N263AS, No. 1 propeller. The blade was removed and initially returned to Hamilton Standard, East Windsor, Connecticut for evaluation and repair. The blade was subsequently shipped to Hamilton Standard's Rock Hill, South Carolina facility for inspection and repair. At Rock Hill, the taper bore ultrasonic indication was confirmed. Hamilton Standard in an August 23, 1995 letter to the FAA, Attachment 4, reported the following work was accomplished to the blade at Rock Hill: taper bore balance lead removed, taper bore borescoped, taper bore grit blasted, taper bore borescoped - no visible faults were found, taper bore blended and borescoped, taper bore ultrasonic inspected - inspection was acceptable, taper bore cleaned and conversion coated, and the teflon strip, decal, nickel sheath, erosion sheath, and internal heater leads were removed. Rock Hill also determined it was necessary to repair the lightning strap. The blade was returned to Hamilton Standard, East Windsor, Connecticut for the lightning strap repair and to complete the remainder of the required work. The following work was accomplished at E. Windsor; lightning strap weld and fiberglass repair, nickel sheath leading edge installed, erosion sheath and film installed, internal heater leads installed, friction reduction strip installed, erosion coat (paint) applied, blade static balanced, decal applied, blade bearing hardware reassembled, airfoil stencilled, and final inspection. The blade was shipped to ASA on August 30, 1994. Hamilton Standard provided ASA with an FAA Form 8130-3 Airworthiness Approval Tag (Attachment 5) for the blade indicating the blade taper bore had been repaired in accordance with PS960A, AD 94-09-06. Although AD 95-05-03 had not been released when the blade was repaired at Rock Hill, the PS960A repair did accomplish the intent of AD 95-05-03 which at that time was the terminating action for the recurring taper bore ultrasonic inspections.

4.3 SIGNIFICANT EVENTS OR MAINTENANCE

ASA computer printout of maintenance records for airplane N256AS from March 1, 1995 up to day of the accident were reviewed to check for any significant events or maintenance that could have affected the propeller.

The following are excerpts from the records of N256AS:

4/29/95	Aircraft encountered hail storm on ground. Carried out visual inspection of exterior of aircraft. No defects noted.
6/12/95	Prop blade on left engine shows delamination. [Remove and replace] #1 and #3 [left engine] prop blades as required. #1 blade SN on 851653, off 860939, #3 on 867601, off 859063. Ground run up normal. No leaks noted at this time.

8/10/95 Left engine torque varies + or - 3%, NH 1%, and fuel flow + or - 30 lbs with power lever set below 30% in descent. Stops at or below 13000 ft. Moved left EEC to DML 23777 operate per MEL 73-21-1 Cat C Exp 8-20-95. Placard installed. Cleared deferred item 23777 by replacing left [engine] EEC 14K switch SN on N5764, SN off M6421. Ops check good. All done IAW MM and Std Practice 664.

8/18/95 [Left] EEC goes to manual while climbing thru 14K, resets OK at lower altitudes. Moved to DML # 23778. Operate per MEL # 73-21-1 Cat C Exp 8/20/95. Placard installed. Suspect HMU potentiometer, need to ohm check. Replaced [left] side HMU and fuel pump assy. SN on HMU F7342 SN off F7694. SN on fuel pump 1890, SN off 2293. Ops and leak check good. Defer cleared. Placard removed.

The prop blade which fractured had been installed on ASA EMB-120 airplane N263AS, No. 1 (left) propeller assembly, prior to being removed for the ultrasonic inspection indication. An ASA computer printout of maintenance for N263AS for the period from April 20, 1993 to May 19, 1994 when the blade was removed was reviewed. The following are excerpts from N263AS maintenance records:

11/30/93 Tug hit [left] front fuselage. Repaired damage [in accordance with] E.O. 120-53-0009. Installed flush skin repair as required. ASA reported there was no damage to the propeller.

3/12/94 Bird strike aft of radome at frame 2 left side. Inspected aircraft at frame 2 left side and found a/c to be safe for ferry flight from DFW to MCN. In MCN, repaired damage [in accordance with] E.O. 120-53-0015. ASA reported there was no damage to the propeller.

4/24/95 Bird strike left side aft of radome. Inspected bird strike and surrounding area. No damage or defects noted. Suitable for continued service.

5.0 AIRWORTHINESS DIRECTIVES

There were two ADs applicable to Hamilton Standard 14RF-9 propellers as installed on Embraer EMB-120 airplanes.

AD 94-09-06 This AD, effective on May 2, 1994, was applicable to several Hamilton Standard 14xF-x propeller series including the 14RF-9 propeller

installed on EMB-120 airplanes. It required a one time ultrasonic shear wave inspection of the taper bore within 45 days to detect cracks. This AD was superseded by AD 95-05-03.

AD 95-05-03 This AD, effective on March 23, 1995, was also applicable to several Hamilton Standard 14xF-x propeller series including the 14RF-9 installed on EMB-120 airplanes. It made the ultrasonic shear wave inspection of the taper bore a recurring inspection at 1,250 cycle intervals. It also provided terminating action for the recurring inspection by removal of the taper bore cork seal and a visual inspection to check for any corrosion.

6.0 LINE CHECK

A line check was accomplished to airplane N256AS at ASA's Macon maintenance facility on August 20, 1995, during the overnight stop. The line check included an inspection of the left and right propellers. A copy of the ASA EMB-120 Line Check checklist which details the items inspected on N256AS on August 20, 1995, is attached, Attachment 6.

A review of the ASA Work Control Cards written during the line check shows the following significant items.

The left engine outboard aft mount and right engine inboard aft mount were worn and were replaced. ASA reported the rubber-like part of mount is a vibration dampener and deteriorates from contact with turbine engine oil necessitating the replacement.

The mid wing deice boot was replaced. The 48 hour pull test of the boot to ensure an adequate bond was placed on the deferred maintenance list.

The left engine intake lip deice boot, which was worn and had several patches, was replaced.

Left and right engine power control rods were out of rig and readjusted.

Left inboard aft gear door half frames were cracked. Inspection showed the gear door could remain in service.

Cargo door seal was pulled loose and was resecured.

Various lights in cockpit, cabin, and on fuselage were replaced.

Various screws on fuselage were replaced.

7.0 AIRPLANE MAINTENANCE

7.1 MAINTENANCE PROGRAM

ASA's EMB-120 airplane maintenance program and inspection intervals are governed by ASA's Standard Practice No. 624, which is based on EMB-120 Maintenance Review Board documents and MSG-3 guidelines. ASA's maintenance program has been approved by the FAA. A copy of ASA's Standard Practice No. 624 is on file with the FAA Atlanta FSDO.

7.2 Maintenance Checks

TYPE	INTERVAL (hrs)	DATE OF LAST CHK	TIME TO NEXT CHK
Line	75	8/20/95	75.0
A	330	8/6/95	91.6
2A	660	8/6/95	91.6
3A	990	8/6/95	91.6
5A	1650	1/27/95	1521.6
C	3300	6/10/94	3160.1
2C	6600	4/28/95	6075.5
4C	13200	4/28/95	6075.5

7.3 WEIGHT AND BALANCE

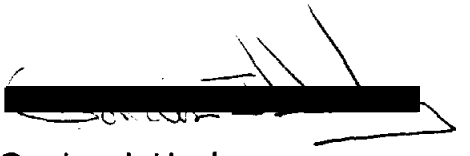
Empty weight of the airplane was 15969 pounds with a center of gravity computed to be 11.27% MAC. The airplane was last weighed on September 17, 1992. ASA received FAA approval for a four year weight and balance check interval in lieu of the FAR required three year interval.

7.4 PROPELLER BALANCING

ASA has a procedure for an on-wing balance of the propeller assembly that is accomplished on a scheduled 3 month interval. ASA indicated the propeller balance is done to minimize propeller vibration that was causing cracking in the engine nacelle sheet metal components. The next scheduled propeller balance check for N256AS was scheduled for October 1995.

8.0 SIGNIFICANT EVENTS OR MAINTENANCE

Other than those items listed in paragraphs 4.1 and 6.0, there were no events or maintenance actions that were considered significant recorded in the logbooks and maintenance records for airplane N256AS for the fuselage, engines, or propellers.



Gordon J. Hookey
Maintenance Records Group Chairman

12/4/95