National Transportation Safety Board
Aviation Incident Data Summary

Location:	Midland, TX	**Incident Number:**	FTW02IA027
Date & Time:	11/02/2001, 0734 CST	**Registration:**	N814AW
Aircraft:	Airbus Industrie A319-132	**Injuries:**	89 None
Flight Conducted Under:	Part 121: Air Carrier - Scheduled		

Analysis

The transport airplane was in cruise flight at flight level 390 for 12 minutes when they received an "engine oil filter bypass" fault message on the engine centralized aircraft monitoring (ECAM) system; however, all of the engine parameters remained within limits. Subsequently, the oil pressure indication for the #1 (left) engine rose into the red band and a "high vibration and a thumping sound" was felt and heard. The flight crew then declared an emergency and diverted to another airport. The captain reported that during the landing roll, he moved both throttle levers into reverse, and simultaneously the cockpit and cabin began to fill with smoke. Air traffic controllers reported they observed white smoke emanating from the #1 engine during the landing roll. The captain stopped the airplane on the high-speed taxiway, turned off both engines, and an emergency evacuation ensued. The 1L and 2L doors were operated normally; however, the 1R door jammed when the flight attendant attempted to open it. Examination of the 1R door actuator and slide did not reveal the reason it failed to operate. Examination of the engine revealed that debris contamination of the #3 bearing initiated spallation of the bearing's outer ring raceway. Cyclic loading from the bearing balls passing over the growing raceway spall resulted in extensive fretting of the outer diameter surface of the outer ring, from which a fatigue crack was initiated. High-cycle fatigue progression radially through the outer ring was followed by rapid fracture and subsequent liberation of the outer ring fragments. The debris contamination more than likely came from the high-pressure compressor (HPC) stubshaft coating, which was liberated and entered the #3 bearing area causing it to fracture, and the engine to lose power. Research revealed this was one of five similar occurrences, which was traced down to a change in the manufacture process for the HPC stubshaft coating. The manufacturer has taken actions to alert operators of the existing problem.

Probable Cause

The National Transportation Safety Board determines the probable cause(s) of this incident to be:
the #1 engine's fatigue failure of the #3 bearing due to the manufacturer's inadequate design of the high-pressure compressor stubshaft coating, which resulted in a loss of engine power and an emergency landing.

Findings

Occurrence #1: LOSS OF ENGINE POWER(PARTIAL) - MECH FAILURE/MALF
Phase of Operation: CRUISE - NORMAL

Findings
1. 1 ENGINE
2. (C) TURBINE ASSEMBLY,SHAFT BEARING - FATIGUE
3. (C) MATERIAL DEFECT(INADEQUATE QUALITY OF MATERIAL) - MANUFACTURER

4. (C) TURBINE ASSEMBLY,SHAFT BEARING - FAILURE,TOTAL

Occurrence #2: FORCED LANDING
Phase of Operation: DESCENT - EMERGENCY

Findings
5. PRECAUTIONARY LANDING - PERFORMED - FLIGHTCREW

Pilot Information

Certificate:	Airline Transport; Flight Instructor; Commercial	**Age:**	45
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Instrument Rating(s):**	Airplane
Other Aircraft Rating(s):	None	**Instructor Rating(s):**	Airplane Single-engine
Flight Time:	15000 hours (Total, all aircraft), 800 hours (Total, this make and model)		

Co-Pilot Information

Certificate:	Airline Transport; Flight Instructor; Commercial	**Age:**	30
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Instrument Rating(s):**	Airplane
Other Aircraft Rating(s):	None	**Instructor Rating(s):**	Airplane Single-engine; Instrument Airplane
Flight Time:	4800 hours (Total, all aircraft), 1000 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Airbus Industrie	**Registration:**	N814AW
Model/Series:	A319-132	**Engines:**	2 Turbo Fan
Operator:	America West Airlines Inc.	**Engine Manufacturer:**	International Aero Engines
Operating Certificate(s) Held:	Flag carrier (121)	**Engine Model/Series:**	IAE-2524-A5
Flight Conducted Under:	Part 121: Air Carrier - Scheduled		

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	**Condition of Light:**	Day
Observation Facility, Elevation:	MAF, 2871 ft msl	**Weather Information Source:**	Weather Observation Facility
Lowest Ceiling:	None	**Wind Speed/Gusts, Direction:**	8 knots / , 230°
Temperature:	17°C	**Visibility**	10 Miles
Precipitation and Obscuration:			
Departure Point:	Houston, TX (IAH)	**Destination:**	Phoenix, AZ (PHX)

Airport Information

Airport:	Midland International (MAF)	**Runway Surface Type:**	Asphalt
Runway Used:	16R	**Runway Surface Condition:**	Dry
Runway Length/Width:	9501 ft / 150 ft		

Wreckage and Impact Information

Crew Injuries:	5 None	**Aircraft Damage:**	None
Passenger Injuries:	84 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Latitude, Longitude:	31.942500, -102.201944		

Administrative Information

Investigator In Charge (IIC):	Jason A Ragogna	**Adopted Date:**	12/03/2004
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov, or at 800-877-6799. Dockets released after this date are available at http://dms.ntsb.gov/pubdms/.		