
Runway overrun, McDonnell Douglas MD-11F, May 30, 2003

Micro-summary: This Douglas MD-11F overran the runway following a long touchdown point.


Event Date: 2003-05-30 at 431 EDT

Investigative Body: National Transportation Safety Board (NTSB), USA

Investigative Body's Web Site: <http://www.nts.gov/>

Cautions:

1. Accident reports can be and sometimes are revised. Be sure to consult the investigative agency for the latest version before basing anything significant on content (e.g., thesis, research, etc).
 2. Readers are advised that each report is a glimpse of events at specific points in time. While broad themes permeate the causal events leading up to crashes, and we can learn from those, the specific regulatory and technological environments can and do change. ***Your company's flight operations manual is the final authority as to the safe operation of your aircraft!***
 3. Reports may or may not represent reality. Many many non-scientific factors go into an investigation, including the magnitude of the event, the experience of the investigator, the political climate, relationship with the regulatory authority, technological and recovery capabilities, etc. It is recommended that the reader review all reports analytically. Even a "bad" report can be a very useful launching point for learning.
 4. Contact us before reproducing or redistributing a report from this anthology. Individual countries have very differing views on copyright! We can advise you on the steps to follow.
-

 National Transportation Safety Board FACTUAL REPORT AVIATION		NTSB ID: NYC03IA117		Aircraft Registration Number: N703GC	
		Occurrence Date: 05/30/2003		Most Critical Injury: None	
		Occurrence Type: Incident		Investigated By: NTSB	
Location/Time					
Nearest City/Place Jamaica		State NY	Zip Code 11401	Local Time 0431	Time Zone EDT
Airport Proximity: On Airport		Distance From Landing Facility:		Direction From Airport:	
Aircraft Information Summary					
Aircraft Manufacturer McDonnell Douglas		Model/Series MD-11F		Type of Aircraft Airplane	
Sightseeing Flight: No			Air Medical Transport Flight: No		
Narrative					
Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident:					
<p>HISTORY OF FLIGHT</p> <p>On May 30, 2003, at 0431 eastern daylight time, a McDonnell Douglas MD-11F, N703GC, operated by Gemini Air Cargo, as flight 17, sustained minor damage during a landing overrun at John F. Kennedy International Airport (JFK), Jamaica, New York. The two certificated airline transport pilots and one other crewmember were not injured. Visual meteorological conditions prevailed, and an instrument flight rules flight plan was filed for the scheduled international cargo flight that departed Brussels Airport (BRU), Brussels, Belgium. The flight was conducted under 14 CFR Part 121.</p> <p>During interviews, the captain and first officer both described the flight as normal and without incident. As the airplane approached the airport, they received the current automated terminal information service (ATIS). The ATIS weather included a visibility greater than 6 miles, winds from 240 degrees at 4 knots, ceilings of 15,000 and 25,000 feet broken, an altimeter setting of 29.56 in/hg, and a temperature and dew point of 15 and 14 degrees Celsius, respectively. The ATIS also indicated that runway 31R/13L was closed, and that inbound flights should expect vectors for the instrument landing system (ILS) approach to runway 4R. The first officer reported that they had originally planned to land on runway 31R, (a 10,000-foot-long, 150-foot-wide, asphalt runway); however, at the airplane's gross weight of about 470,000 pounds, they could also land on runway 4R (a 8,400-foot-long, 200-foot-wide, asphalt runway.) While they usually did not land on runway 4R, both pilots reported that they had landed on runway 4R during prior flights.</p> <p>The captain was the flying pilot. He received vectors to the final approach course for the ILS to runway 4R and planned to land visually. The airplane's approach speed was an indicated airspeed of 163 knots. He utilized the autopilot to 500 feet, before clicking it off, and stayed on the glide slope. The airplane was configured for a normal approach, which included autobrakes set to minimum and 35 degrees of flaps. The captain reported that the airplane touched down between 1,500 and 1,800 feet beyond the approach end of the runway, at an airspeed of about 158 knots.</p> <p>The captain applied reverse thrust and everything seemed normal until he observed the alternating red and white runway lights, which seemed to be coming up fast. The captain stated that with about 3,000 feet of runway remaining, at a speed of 110 knots, he began to apply manual braking. The first officer stated he could feel the brakes grab, and the airplane's nose pitched down. With 1,000 feet of runway remaining, the airplane's speed was about 80 knots. The first officer reported that he intentionally did not make the "80-knot callout" because he did not want the captain to secure the thrust reversers. The captain reported that the airplane did not seem to be responding normally to manual braking. He added that the airplane's speed was "between 60 and 80 knots, maybe even 40 knots," when the airplane departed the end of the runway.</p> <p>The airplane departed the end of the runway and entered an Engineered Materials Arresting System (EMAS), located about 123 feet beyond the end of the runway. The captain stated he remained on the</p>					
FACTUAL REPORT - AVIATION					
Page 1					

National Transportation Safety Board

FACTUAL REPORT

AVIATION

NTSB ID: NYC03IA117

Occurrence Date: 05/30/2003

Occurrence Type: Incident

Narrative (Continued)

brakes until the airplane came to a stop. He secured the thrust reversers as the airplane entered the EMAS because he did not want them to sustain "FOD" damage.

The captain further stated that he felt the airplane should have been able to stop in the distance remaining when he began to apply manual braking, and suspected that the runway might have been wet; however, when he exited the airplane, he did not notice any moisture on the pavement.

The airplane was equipped with a cockpit voice recorder and a flight data recorder, which were retained for further examination.

The incident occurred during the hours of night, approximately 40 degrees, 38.75 minutes north latitude, and 73 degrees, 45.26 minutes west longitude.

PERSONNEL INFORMATION

The captain was hired by Gemini Air Cargo on May 18, 1998. The captain held an airline transport pilot certificate for multi-engine land airplanes, and a commercial pilot certificate for single engine land airplanes. He also held type ratings for Lear 60, Boeing 707, 720, and McDonnell Douglas DC-10 and MD-11 series airplanes.

He reported 7,000 hours of total flight experience, which included about 1,000 hours in the MD-11F, all as pilot-in-command. The captain completed a satisfactory company flight proficiency check on April 12, 2003.

The captain's most recent FAA first class medical certificate was issued on March 18, 2003.

The first officer was hired by Gemini Air Cargo on December 12, 2000. The first officer held an airline transport pilot certificate for multi engine land airplanes. He also held type ratings for Raytheon BE-200, and McDonnell Douglas MD-11 series airplanes.

The first officer reported 6,000 hours of total flight experience, which included 900 hours in the MD-11F. The first officer completed a satisfactory company flight proficiency check on December 8, 2002.

The first officer's most recent FAA first class medical certificate was issued on May 8, 2003.

AIRCRAFT INFORMATION

Both flight crew members reported normal cockpit indications before, during, and after the incident.

The airplane was maintained under a continuous airworthiness inspection program and was most recently inspected on May 26, 2003. There were no open minimum equipment list (MEL) items for the flight.

The airplane was equipped with an automatic braking system (ABS) configured for a high deceleration rate, and selectable for minimum, medium, or maximum braking. In the minimum setting, braking is automatically applied after spoiler deployment, and at 3 seconds after nose wheel touchdown.

Post incident examination of the airplane, which included a brake inspection and an operational check of the autobrake system, did not reveal any faults or abnormalities. Five main landing gear tires, and the right nose gear tire were damaged during the incident. In addition, two first stage compressor blades from the number 3 engine, one first stage compressor blade from the number 1 engine sustained minor damage.

METEOROLOGICAL INFORMATION

National Transportation Safety Board

FACTUAL REPORT

AVIATION

NTSB ID: NYC03IA117

Occurrence Date: 05/30/2003

Occurrence Type: Incident

Narrative (Continued)

A weather observation taken at JFK, at 0451, reported: Winds from 230 degrees at 4 knots; visibility 7 statute miles, ceiling 25,000 broken; temperature and dew point 14 degrees C; altimeter 29.56 in\hg.

AERODROME INFORMATION

John F. Kennedy International Airport was operated by the Port Authority of New York and New Jersey. The airport was positioned at 40 degrees, 38 minutes, 28.5 seconds, north latitude; 73 degrees, 46 minutes, 41.9 seconds, west longitude, at an elevation of 12.7 feet above sea level.

Runway 4R-22L, was 8,400 feet long, 200 feet wide, and constructed of grooved asphalt and concrete. It was equipped at both ends with an instrument landing system (ILS), and an approach lighting system, with sequenced flashers, and touchdown zone lighting.

All runway and approach lighting systems on runway 4R-22L were operational at the time of the incident.

The overrun area of runway 4R contained an EMAS, that was 392 feet long, and 200 feet wide. The EMAS consisted of cellular cement material, which was intended to safely decelerate and stop aircraft that overrun the runway. The EMAS bed contained a paved "set back" area of 113 feet.

FLIGHT RECORDERS

Examination of the flight data recorder revealed that the airplane's ground speed at main gear touchdown was about 164 knots. The spoilers deployed and the nose gear touched down about 6 seconds later, at a ground speed of 154 knots, after the airplane had rolled a calculated distance of approximately 1,612 feet. After the nose gear touched down, the number 1, 2, and 3 engine thrust reversers deployed. The airplane's calculated ground roll from main gear touchdown to where it came to rest, was about 5,950 feet.

The 30 minute cockpit voice recorder only contained post incident conversations. The first officer was unaware of any company policies which required pulling the cockpit voice recorder circuit breaker after an abnormal incident.

WRECKAGE INFORMATION

The airplane's nose gear came to a stop approximately 238 feet beyond the end of the runway, after it traveled approximately 115 feet into the EMAS.

Three sets of parallel of tire marks were observed, and could be followed from the airplane's left, fuselage, and right main landing gear assemblies, to a point about 1,400 feet prior to the end of the runway. The tire marks veered to the right of the runway centerline, about 200 feet before the end of the runway. After 1,400 feet, the tire marks blended into other tire marks present on the runway.

TESTS AND RESEARCH

Runway friction tests were conducted at 40 and 60 mph in both directions (4R-22L), on May 31, 2003, using continuous friction measuring equipment. The average friction values were within acceptable FAA guidelines.

ADDITIONAL INFORMATION

National Transportation Safety Board

FACTUAL REPORT

AVIATION

NTSB ID: NYC03IA117

Occurrence Date: 05/30/2003

Occurrence Type: Incident

Narrative (Continued)

Airplane Performance

A recorded radar and performance study was completed for the incident flight by a Safety Board Specialist using data from the airplane's FDR, JFK airport surveillance radar, ATIS weather information, and on scene measurements.

According to the specialist's report, the airplane crossed the runway threshold at an altitude of about 60 to 120 feet above the ground. The main landing gear touched down approximately 2,800 to 3,000 feet from the beginning of runway 4R, and the nose gear touched down at about 4,300 feet. The automatic braking system initiated approximately three seconds after nose wheel touchdown. The pilot initiated manual braking with about 1,400 feet of runway remaining. The airplane departed the end of the runway traveling at a ground speed of about 30 knots, before stopping in the EMAS. The airplane's center of gravity came to rest about 160 feet from the end of runway 4R.

The required stopping distance for an airplane configured with high deceleration rate, minimum braking setting, weighing 471,600 pounds, and 35 degrees of flaps was about 6,600 feet.

Gemini Runway Selection Criteria

According to the operator's performance data for the airplane, the maximum landing weight allowed to utilized runway 4R with zero wind, in a 35 degree flap, auto-spoiler configuration was 491,500 pounds for a "dry" runway, and 417,500 pounds for a "wet" runway. With a 5 knot tailwind, the maximum landing weights for a "dry" and "wet" runway were 452,800, and 378,600 pounds, respectively.

The maximum landing weight allowed to utilized runway 4R with zero wind, in a 50 degree flap, auto-spoiler configuration was 491,500 pounds for a "dry" runway, and 463,100 pounds for a "wet" runway. With a 5 knot tailwind, the maximum landing weights for a "dry" and "wet" runway were 491,500, and 420,700 pounds, respectively.

The airplane's maximum structural landing weight was 491,500 pounds.

Captain's Previous Landing on Runway 4R

The captain reported that the incident landing was his second landing attempt on Runway 4R, in less than 10 days. According to company records, the captain landed on runway 4R, on May 21, 2003; however the airplane's weight during the landing was about 14,000 pounds lighter than on the incident flight.

Sun Position

According to United States Naval Observatory astronomical data obtained for the Jamaica, New York, area for the date of the incident, civil twilight was to begin at 0455, and sunrise was to occur at 0527.

Wreckage Release

The airplane was released on June 2, 2003, to a representative of the operator.

National Transportation Safety Board

**FACTUAL REPORT
AVIATION**





NTSB ID: NYC03IA117

Occurrence Date: 05/30/2003

Occurrence Type: Incident

Narrative (Continued)

 National Transportation Safety Board FACTUAL REPORT AVIATION		NTSB ID: NYC03IA117				
		Occurrence Date: 05/30/2003				
		Occurrence Type: Incident				
Landing Facility/Approach Information						
Airport Name John F. Kennedy International		Airport ID: JFK	Airport Elevation 13 Ft. MSL	Runway Used 4R	Runway Length 8400	Runway Width 200
Runway Surface Type: Asphalt						
Runway Surface Condition: Dry						
Type Instrument Approach: ILS-complete						
VFR Approach/Landing: None						
Aircraft Information						
Aircraft Manufacturer McDonnell Douglas		Model/Series MD-11F		Serial Number 48411		
Airworthiness Certificate(s): Transport						
Landing Gear Type: Retractable - Tricycle						
Homebuilt Aircraft? No		Number of Seats: 3	Certified Max Gross Wt. 630500 LBS		Number of Engines: 3	
Engine Type: Turbo Jet		Engine Manufacturer: General Electric		Model/Series: CF6-80-C2D1F	Rated Power: 63500 LBS	
- Aircraft Inspection Information						
Type of Last Inspection Continuous Airworthiness		Date of Last Inspection 05/2003	Time Since Last Inspection 306 Hours		Airframe Total Time 41725 Hours	
- Emergency Locator Transmitter (ELT) Information						
ELT Installed? Yes		ELT Operated? No		ELT Aided in Locating Accident Site? No		
Owner/Operator Information						
Registered Aircraft Owner Wells Fargo Bank Northwest		Street Address 299 S. Main Street				
		City Salt Lake City		State UT	Zip Code 84111	
Operator of Aircraft GEMINI AIR CARGO INC		Street Address 44965 Aviation Drive, Suite 300				
		City Dulles		State VA	Zip Code 20166	
Operator Does Business As:				Operator Designator Code: G6OA		
- Type of U.S. Certificate(s) Held:						
Air Carrier Operating Certificate(s): Cargo						
Operating Certificate:			Operator Certificate:			
Regulation Flight Conducted Under: Part 121: Air Carrier						
Type of Flight Operation Conducted: Scheduled; International; Cargo						

 <p>National Transportation Safety Board FACTUAL REPORT AVIATION</p>	NTSB ID: NYC03IA117
	Occurrence Date: 05/30/2003
	Occurrence Type: Incident

First Pilot Information

Name On File	City On File	State On File	Date of Birth On File	Age 59
-----------------	-----------------	------------------	--------------------------	-----------

Sex: M	Seat Occupied: Left	Principal Profession: Civilian Pilot	Certificate Number: On File
--------	---------------------	--------------------------------------	-----------------------------

Certificate(s): Airline Transport

Airplane Rating(s): Multi-engine Land; Single-engine Land

Rotorcraft/Glider/LTA: None

Instrument Rating(s): Airplane

Instructor Rating(s): Airplane Multi-engine; Airplane Single-engine

Type Rating/Endorsement for Accident/Incident Aircraft? Yes	Current Biennial Flight Review? 04/2003
---	---

Medical Cert.: Class 1	Medical Cert. Status: Valid Medical--w/ waivers/lim.	Date of Last Medical Exam: 03/2003
------------------------	--	------------------------------------

- Flight Time Matrix	All A/C	This Make and Model	Airplane Single Engine	Airplane Multi-Engine	Night	Instrument		Rotorcraft	Glider	Lighter Than Air
						Actual	Simulated			
Total Time	7000	1000								
Pilot In Command(PIC)	5500									
Instructor										
Last 90 Days	103	103								
Last 30 Days	42	42								
Last 24 Hours	0	0								

Seatbelt Used? Yes	Shoulder Harness Used? Yes	Toxicology Performed? Yes	Second Pilot? Yes
--------------------	----------------------------	---------------------------	-------------------

Flight Plan/Itinerary

Type of Flight Plan Filed: IFR

Departure Point Brussels	State	Airport Identifier EBBR	Departure Time 2127	Time Zone EDT
-----------------------------	-------	----------------------------	------------------------	------------------

Destination Jamaica	State NY	Airport Identifier KJFK	
------------------------	-------------	----------------------------	--


Type of Clearance: IFR

Type of Airspace: Class B

Weather Information

Source of Briefing: Company

Method of Briefing: In Person

 <p>National Transportation Safety Board FACTUAL REPORT AVIATION</p>	NTSB ID: NYC03IA117
	Occurrence Date: 05/30/2003
	Occurrence Type: Incident

Weather Information

WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
JFK	0451	EDT	13 Ft. MSL	NM	Deg. Mag.

Sky/Lowest Cloud Condition: _____ Ft. AGL Condition of Light: **Night**

Lowest Ceiling: **Broken** 12000 Ft. AGL Visibility: **7** SM Altimeter: **29.56** "Hg

Temperature: **14 °C** Dew Point: **24 °C** Wind Direction: **230** Density Altitude: _____ Ft.

Wind Speed: **4** Gusts: _____ Weather Conditions at Accident Site: **Visual Conditions**

Visibility (RVR): _____ Ft. Visibility (RVV) _____ SM Intensity of Precipitation: _____

Restrictions to Visibility: **None**


Type of Precipitation: **None**

Accident Information

Aircraft Damage: **Minor** Aircraft Fire: **None** Aircraft Explosion: **None**

Classification: **U.S. Registered/U.S. Soil**

- Injury Summary Matrix	Fatal	Serious	Minor	None	TOTAL
First Pilot				1	1
Second Pilot				1	1
Student Pilot					
Flight Instructor					
Check Pilot					
Flight Engineer					
Cabin Attendants					
Other Crew				1	1
Passengers					
- TOTAL ABOARD -				3	3
Other Ground					
- GRAND TOTAL -				3	3

 <p>National Transportation Safety Board FACTUAL REPORT AVIATION</p>	NTSB ID: NYC03IA117
	Occurrence Date: 05/30/2003
	Occurrence Type: Incident

Administrative Information

Investigator-In-Charge (IIC)

Luke Schiada

Additional Persons Participating in This Accident/Incident Investigation:

Eric E West
Air Safety Investigator
FAA Headquarters (AAI-100)
800 Independence Aveune, S.W.
Washington, DC 20591

Jim Carlson
Director of Safety
Gemini Air Cargo
44965 Aviation Drive, Suite 300
Dulles, VA 20166

William C Steelhammer
Senior Flight Safety Investigator
Boeing Long Beach Division
3855 Lakewood Boulevard
Long Beach, CA 90846