National Transportation Safety Board
Aviation Accident Final Report

Location:	PACIFIC OCEAN, PO	**Accident Number:**	DCA98MA015
Date & Time:	12/28/1997, 1410	**Registration:**	N4723U
Aircraft:	Boeing 747-122	**Aircraft Damage:**	Minor
Defining Event:		**Injuries:**	1 Fatal, 18 Serious, 171 Minor, 203 None
Flight Conducted Under:	Part 121: Air Carrier - Scheduled		

Analysis

The flightcrew inadvertently flew into an area of clear air turbulence. Weather forecasts indicated that there was not to be turbulence in the area where it was encountered. The ability to forecast clear air turbulence over the ocean is limited. In addition, the Japanese-speaking flight attendant did not fully translate one of the captain's instructions to fasten seat belts into Japanese, although such an announcement was made and translated several times prior to the turbulence encounter. Most of the passengers spoke only Japanese.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot-in-command's inadvertent flight into adverse weather conditions, and the difficulty of obtaining adequate weather forecasts of over-ocean turbulence. Factors contributing to the accident include the presence of clear air turbulence, and the failure of the flight attendant to issue a safety advisory.

Findings

Occurrence #1: IN FLIGHT ENCOUNTER WITH WEATHER
Phase of Operation: CRUISE

Findings
1. (F) WEATHER CONDITION - TURBULENCE,CLEAR AIR
2. (C) FLIGHT INTO ADVERSE WEATHER - INADVERTENT - PILOT IN COMMAND
3. (C) WEATHER EVALUATION - NOT POSSIBLE
4. (F) WEATHER FORECAST - INFORMATION INSUFFICIENT
5. (F) WEATHER FORECAST - REDUCED
6. (F) SAFETY ADVISORY - NOT ISSUED - FLIGHT ATTENDANT

Factual Information

HISTORY OF FLIGHT

On December 28, 1997, at 1340 UTC, a United Airlines Boeing 747-122, N4723U, experienced an episode of what the captain described as wave action (see footnote 1) followed by severe turbulence (two closely spaced turbulence encounters) about 870 nautical miles east southeast of New Tokyo International Airport, Narita, Japan (NRT) on Pacific Ocean navigation track 12 (see footnote 2). The airplane was operating under 14 Code of Federal Regulations (CFR) Part 121 in VFR conditions at the time of the accident and was bound for Honolulu, Hawaii (HNL). Of the 374 passengers (including 5 infants) and 19 crewmembers on board, 15 passengers and 3 flight attendants received serious injuries and 1 passenger was killed. Also, 161 minor injuries were sustained by flight attendants and passengers. Following the turbulence encounter, the airplane returned to New Tokyo Airport for an uneventful landing.

According to the captain, the overall flight planning activity was routine but there was more concern about turbulence than usual. Because of this concern, the captain selected track 12 as the route of flight because there were no SIGMETs near that track. However, even with that selection the captain felt some turbulence might be encountered approximately two hours after takeoff. The captain briefed the purser of this possibility. He also stated that prior to takeoff during the "welcome aboard" announcement he told the passengers that there might be turbulence enroute. The Japanese-speaking flight attendant translated this announcement into Japanese. Also before takeoff, a safety video was played for the passengers; this included a warning to passengers to keep their seat belts fastened when seated. The instructions in this safety video were narrated in English and also clearly communicated to Japanese language passengers by means of Japanese subtitles.

The takeoff, departure, and climb were uneventful. The Captain said that he turned the seat belt sign off during climb because the ride was smooth. After he turned the seat belt sign off, the captain made a PA announcement that included information about common weather patterns during that time of year, the probability of turbulence and a request that each passenger keep his or her seat belt fastened when seated. The Japanese-speaking flight attendant responsible for translating the announcement went to the purser to discuss the best way to communicate this information to the passengers. The flight attendant did not translate all of this announcement into Japanese. She stated that she did not want to alarm the passengers. At that time, the aircraft reached cruise altitude and the seatbelt sign was turned on for approximately 15 minutes when minor wave activity was encountered. When the minor wave action subsided, the seatbelt sign was turned off. Customary announcements during this period were made in English and Japanese. The seatbelt sign then remained off for approximately one hour.

The captain stated that approximately one hour and forty minutes into the flight the airplane encountered what he described as "wave action" and he turned the seatbelt sign on, again, as a precaution. The customary public address announcements to have the passengers fasten their seat belts were made in English and Japanese. Prior to the encounter, the captain noted seeing stars above. He also illuminated exterior lighting to look for clouds and he saw none. The captain also radioed NW flight 90, ahead of him, requesting a ride report. NW 90 reported that the ride was smooth with an occasional ripple of light turbulence at their altitude. The first turbulence encounter happened no more than one to two minutes later. According to the flight

data recorder (FDR), the aircraft encountered severe turbulence about 2 minutes after the "wave activity."

Seconds later, the flight experienced another turbulence episode. During the turbulence, the captain made a PA announcement for the flight attendants to sit down and then he made a PA announcement to the passengers telling them not to be alarmed. The captain ordered the first officer to reduce speed, and he complied by reducing the indicated airspeed to approximately 330-340 knots indicated airspeed. The captain said that he broadcast notice of the turbulence encounter to other flights. Northwest flight 22 responded by saying they were climbing to FL 350.

The captain said that at the time of the turbulence encounters, about 50 to 60 miles ahead and right of course, there were some light green echoes on radar. No red echoes were observed. At the time of the turbulence encounters, the radar was selected to the 80-mile range with the antenna tilted five degrees down. The aircraft's radar turbulence detection mode was also utilized using the turbulence detection switch. The turbulence detection mode allows the pilot to switch between Turbulence "Precip", Turbulence "Doppler" or "Both". The pilots stated prior to the encounter, both radar displays were on, the "Precip"/"Doppler" selector was in "Both" and was being switched back and forth between "Precip" and "Doppler" and that no "Doppler" returns were observed. Before and after the turbulence encounters, the captain saw a band of clouds with no lightning to the right and below the aircraft, but he did not see any lightning or clouds along the route of flight. Also at this time, Autopilot B was in Command mode and the flight director was in INS mode. Autopilot altitude hold was on and the autothrottles were not in use, according to company policy. The flight crewmembers did not remember the autopilot disengaging because of the turbulence. He said that the autopilot has a turbulence mode but it is rarely used on over-water operations unless the flight was in continuous light to moderate turbulence. At the time of the turbulence encounters, the flightcrew stated that total air temperature (TAT) read approximately minus 40-44 degrees C and did not change when the turbulence was encountered. He said that there was no rapid change in wind direction or speed before or after the encounter with turbulence.

At the time of the turbulence encounters, the flight crew stated that the overspeed warning sounded. The first officer reduced power with the captain assisting on the throttles. Warning lights illuminated on inertial navigation system (INS) numbers one and three. The number four hydraulic low pressure lights also illuminated. The captain said it concerned him that there might be structural damage to the airplane. The INS units worked normally after the error codes were cleared and no flight instrumentation was lost during the events. Upon investigation by the crew, it was determined the number four hydraulic lights illuminated because the hydraulic panel switches had apparently been bumped to the off position by something in the cockpit. The second officer believed that, during the turbulence, the switches may have been bumped into the off positions by a tray sitting on his desk. All other systems were indicating normal operation.

At the point at which the captain requested permission from ATC to climb to FL330, he asked the purser to provide him with information about the conditions in the cabin following the turbulence. The purser informed the captain that a flight attendant was in the aisle, the cabin was "a mess", and there were several injuries. The captain then asked the purser to see if a doctor was on board. Two doctors were found who asked for and were given the airplane's medical kit, oxygen bottles and first aid kits. One doctor stayed with the flight attendants in

the back of the cabin who were performing CPR on an unconscious passenger. The other doctor assisted the flight attendants who were providing first aid to other passengers.

When the aircraft was out of the area of turbulence, the captain asked the second officer to examine the cabin. The second officer reported to the captain that there were several injuries among the flight attendants and passengers. After the second officer returned to the cockpit, the captain went to the cabin to observe the damage and injuries himself.

The captain said that he considered whether to divert to Midway Island, the nearest suitable landing airport, or to go back to Narita. Because of its proximity, he considered a diversion to Midway appropriate if there were structural damage to the aircraft. On the other hand, he favored returning to Narita if he determined that passengers or crewmembers needed medical attention.

In addition to what he saw for himself upon examining the cabin, the captain also received the recommendations of one of the passenger-doctors who suggested getting medical aid as soon as possible. Upon making an assessment of the injuries and determining that the aircraft had not sustained structural damage, the captain made the decision to return to Narita for medical assistance. The captain stated that it took approximately 20 minutes to make the decision to return to Narita, because he did not want to make a final decision until he had fully assessed the airworthiness of the airplane, and had as much information from the flight attendants and the attending physician about the situation in the cabin as he needed. He said there was some difficulty in communicating with the doctors because the doctors could not speak English.

When he returned to the cockpit, the captain radioed UAL 824 (about 600 miles ahead of UAL 826) and asked them to contact UAL Dispatch to advise them that they were returning to Narita. He stated that he then used his emergency authority to turn off course and to climb 500 feet. Tokyo Air Traffic Control quickly gave them a clearance back to Narita when the ATC clearance was requested shortly thereafter. A turn was made to the north to reverse course and to parallel, in reverse direction, the navigation track they were previously assigned. The captain then made a second visit to the cabin where he observed several flight attendants under duress because of injuries.

According to the captain, United Airlines dispatch asked for an estimated time of arrival for Narita and the number of injuries onboard. Thereafter, United Flight Dispatch began working with United personnel at the Narita station and elsewhere to prepare for the arrival of the flight.

INJURIES TO PERSONS

Japan's Aircraft Accident Investigation Commission (AAIC) provided passenger injury information. Flight attendant injury information was provided by flight attendants during their interviews. See page 4 for injury matrix chart.

DAMAGE TO AIRCRAFT

The aircraft suffered no external or internal structural damage. Numerous fixtures and components of interior furnishings were damaged by acceleration forces and by being struck by objects and individuals in the cabin. A full description of damage to the interior of the airplane can be found in the Safety Board public docket for this accident.

PERSONNEL INFORMATION

Captain:

Total flying time: about 15,000 flight hours Time as B-747 captain: 1,100-plus hours Attended Advanced Maneuvers Training Route qualification: During B-747 initial operating experience Number of Pacific crossings: 30-40 Crew rest prior to accident flight: 24 hours

First Officer:

Total flying time: about 10,000 hours Time as B-747 crewmember: about 1,500 hours Attended Advanced Maneuvers Training Route qualification: During B-747 initial operating experience Number of Pacific crossings: about 35 Crew rest prior to accident flight: 30-plus hours

Second Officer:

Total flying time: about 3,500 hours pilot flight time, 850 hours second officer flight time Time as B-747 crewmember: 850 hours as B-747 S/O Did not attend Advanced Maneuvers Training Number of Pacific crossings: 10-15 Crew rest prior to accident flight: 30 hours

Flight Attendants:

2L Position 2L Initial Training March, 1972 Emergency Procedure Training September, 1997

Position 1L Initial Training July, 1968 Emergency Procedure Training August, 1997

Position 4L Initial Training June, 1970 Emergency Procedure Training September, 1997

Position 3R Initial Training March, 1978 Emergency Procedure Training July, 1997

Position 2L Initial Training May, 1970 Emergency Procedure Training October, 1997

Position 1R Initial Training April, 1970 Emergency Procedure Training May, 1997

Position 5R Initial Training February, 1972 Emergency Procedure Training October, 1997

Position 5L Initial Training June, 1963 Emergency Procedure Training April, 1997

Position 3L Initial Training December, 1989 Emergency Procedure Training May, 1997

Position 3L Initial Training June, 1972 Emergency Procedure Training June, 1997

Position 2R Initial Training March, 1969 Emergency Procedure Training April, 1997

Position 4R Initial Training July, 1968 Emergency Procedure Training July, 1997

Position UD Initial Training February, 1972 Emergency Procedure Training August, 1997

Position 2R Initial Training May, 1969 Emergency Procedure Training September, 1997

Position 4L Initial Training March, 1971 Emergency Procedure Training December, 1996

Position 3R Initial Training July, 1988 Emergency Procedure Training April, 1997

METEOROLOGICAL INFORMATION

Synoptic Situation

The December 28, 1997, 1200Z, Surface Analysis chart issued by the Japan Meteorological Agency showed a low pressure center near 36 degrees north latitude and 158 degrees east longitude, moving east-northeastward at 35 knots. An occluded front stretched from the low southward to about 32 degrees north latitude and 158 degrees east longitude. At this point a

cold front extended southward and a warm front extended southeastward.

Upper Air Data

The data showed westerly winds at about 105 knots at 30,000 feet, westerly winds at about 125 knots at 34,000 feet, and westerly winds at about 140 knots at 39,000 feet in the area of the accident. Significant horizontal wind shears were evident in the area of the accident at these altitudes. A vertical wind change [vector] of 25 knots between 30,000 feet and 34,000 feet was calculated for the area of the accident. A maximum value of 39 knots was noted about 115 nautical miles to the east of the accident location. Between 34,000 feet and 38,600 feet a vertical wind change of 18 knots was noted. A maximum value of 39 knots was noted about 245 nautical miles northeast of the accident site.

In-Flight Weather Advisories

The following SIGMETs were issued by the Japan Meteorological Agency on December 28, 1997: SIGMET 3 issued at 0840Z and valid until at 1240Z: Tokyo Flight Information Region [FIR] moderate to severe turbulence forecast between Flight Level 29,000 feet to Flight Level 35,000 feet moving east-northeast at 15 knots and intensifying. The area encompassed by this SIGMET did not include the accident location. SIGMET 4 issued at 1240Z and valid until 1640Z: Tokyo FIR moderate to severe turbulence forecast between Flight Level 29,000 feet and Flight Level 35,000 feet moving east-northeast at 15 knots no change in intensity. The area encompassed by this SIGMET did not include the accident location.

Pertinent Weather Information Provided to Flight Crew Prior to Departure

Information regarding possible moderate turbulence vicinity 145 degrees east longitude from Flight Level 28,000 feet [FL 280] to FL 380, and 160 degrees east to 170 degrees east longitude from FL 310 to FL 400. Information from SIGMET 3 valid from December 28 at 0840Z to December 28 at 1240Z. SIGMET 3 called for moderate to severe turbulence between Flight Level FL 290 to FL 350. The area encompassed by this SIGMET did not include the accident location. A Significant Weather Chart valid December 28, 1997 at 1200Z issued by the Regional Area Forecast Center [RAFC] Tokyo. Along track 12 the chart showed an area of forecast moderate turbulence the western extent beginning at about 158 degrees east longitude. Along track 12 occasional [1/8 to 4/8 coverage] embedded cumulonimbus activity was forecast starting at about 161 degrees east longitude with tops to 50,000 feet.

The following Pilot Report (PIREP): over 39 degrees north latitude 160 degrees east longitude / time 0908Z / FL 350 /occasional light chop from 158 degrees east longitude to 162 degrees east longitude.

A Vertical Cross Section of weather conditions from Narita to Honolulu (36 degrees north 150 degrees east, to 35 degrees north 160 degrees east, to 33 degrees north 170 degrees east) prepared by the Japan Meteorological Agency. According to United Airlines this information is only routinely provided for certain routes. The pilots were provided a vertical cross section for track 11, 120 miles to the north of track 12.

According to Japan Aircraft Accident Investigation Commission research into this incident, the New Tokyo Aviation Weather Service Center (New Tokyo AWSC) of the Japan Meteorological Agency (JMA) is responsible to issue SIGMET information for the Tokyo FIR when:

SIGMET information for turbulence is issued when an aircraft observation is reported and the phenomenon is expected to continue; or the occurrence of severe turbulence is expected by

examining weather charts, GMS cloud imagery, etc. SIGMET information for severe turbulence associated with cumulonimbus clouds is issued when a cluster of cumulonimbus clouds covers more than around a square of 100 kilometers by 100 kilometers. SIGMET information for thunderstorms is issued when a cluster of cumulonimbus clouds covers more than around a square of 200 kilometers by 200 kilometers. SIGMETs for thunderstorms do not include references to associated turbulence.

According to Japanese weather personnel, there were no SIGMETs in effect for the time and area of the accident because by examining weather charts, GMS cloud imagery etc, no occurrence of severe Clear Air Turbulence (CAT) was expected around 32 degrees 30 minutes north, 159 degrees east at 1400 UTC on 28 December. Although a cluster of cumulonimbus clouds was observed around the point, its scale was small and it was not expected to develop into a large-scale cluster of cumulonimbus clouds. Meteorological personnel also received the following Routine Air Reports from aircraft at 32 degrees north and 160 degrees east: 1312 UTC NWA 10 FL 350 CODE 0 (Smooth) 1339 UTC NWA 90 FL 350 CODE 1 (Occasional Light) 1351 UTC NWA 22 FL 350 CODE 0 (Smooth) 1502 UTC JAL 72 FL 370 (No Turbulence)

Summary of National Center for Atmospheric Research [NCAR] and Naval Research Laboratory Findings:

Satellite analyses indicated the presence of a rapidly-developing frontal wave system in the 6 hours leading up to the incident, which suggested synoptic and mesoscale circulation. A region of convective storms appeared to be forming to the southwest of this developing wave, just prior to the penetration of this region by the accident aircraft. These cells continued to develop rapidly after the accident, as evident in the satellite data. Convection is at or just below the altitude of the aircraft altitude of FL 310 (9.5 kilometers and approximately -40 degrees C).

Analyses indicated a rapidly deepening frontal wave and cyclonic circulation developed in the 12 hours preceding the accident, which moved as it developed to the east. The model appeared to confirm that a region of convection existed to the southwest of the primary wave, in the vicinity of the accident site. The model indicated a strong jet stream immediately above the flight (60 meters/second from the west) and the development of an extensive region of turbulence kinetic energy (TKE) immediately to the east of the event region. There are indications of mesoscale gravity wave structure in and around the system.

According to NCAR, the turbulence linked to this incident may have been associated with convection reaching up to or just below flight altitude, with a possible encounter within the convective cell, or immediately above it, or adjacent to such a cell.

FLIGHT RECORDERS

The 30-minute cockpit voice recorder magnetic tape recorded the last thirty minutes of nonpertinent cockpit conversation prior to engine shutdown after landing at Narita.

The flight data recorder, a Sundstrand Data Control model, indicated that while the aircraft was cruising at flight level 310, it experienced a positive 1.814 G vertical acceleration excursion. Six seconds later, the aircraft sustained a negative 0.824 G vertical acceleration. The aircraft subsequently rolled approximately 18 degrees right wing down and recovered to wings level flight shortly thereafter. During these events, altitude excursions were nominal. A full description of flight recorder information can be found in the Safety Board public docket for this accident.

SURVIVAL ASPECTS

According to the AAIC, none of the passengers who sustained fatal or serious injuries were wearing their seat belts at the time of the accident. The passenger who sustained fatal injuries was seated at 46F. During postmortem examination, an autopsy was not conducted. A medical officer, assigned by the JAAIC, examined the postmortem examination documents and believed that the victim probably suffered a fatal cervical spinal injury. The AAIC interviewed a passenger in seat 46G seated next to the female passenger who sustained fatal injuries in seat 46F. He stated the following: She was seated with her seat belt unfastened. She was lifted up from the seat by the third severe negative G, and possibly forcefully hit her head into the ceiling panel over the right side aisle or into the 46 G luggage bin cover frame. He was seated in seat 46G without his seatbelt fastened and only remembered that the fatally injured passenger was lifted up over him. She fell down to the aisle between seats 44J and 45H. (See footnote 3) A full description of passenger injuries can be found in the Safety Board public docket for this accident.

The pre-departure video briefing included a statement (in English, with Japanese subtitles) that passengers should keep their seatbelts fastened while seated.

TESTS AND RESEARCH

Some flight attendant statements indicate that the chime feature associated with the illumination of the seat belt was operative prior to the turbulence encounter; however, some passenger statements indicate that the chime was not heard. An examination of maintenance records revealed no anomalies with the chime on the flight segments leading up to the incident flight.

After the airplane was ferried to the United States, a teardown and further testing of components of the Collins Aircraft Passenger Address Amplifier (PA #1) revealed a failed photoelectric cell (Photoswitch RP11 (Lamp)) within the unit. This failed component did not allow the low chime to operate.

Investigation could not determine if the low chime failed during the incident flight (prior to or following the turbulence encounter) or during the ferry flight from NRT after the incident, while the aircraft was sitting in storage (see footnote 4), or at the time the aircraft was powered up for the purposes of post-accident testing at the storage site.

ORGANIZATIONAL AND MANAGEMENT INFORMATION

Following the accident, United Airlines issued Flight Safety Information Bulletin 98-1, titled "Turbulence Encounter and Passenger Fatality." This bulletin described the circumstances of the accident, commended the crew for conscientiously discharging its duties and also reiterated the importance of effective communication between pilots and flight attendants. Shortly after the accident, United Airlines took measures to reinforce its policy of encouraging passengers to wear seat belts whenever seated and regardless of whether the seat belt sign is illuminated.

Footnotes:

1 When asked to define "wave activity", the captain said that when flying straight and level, the aircraft started to rise or descend (oscillate) about 50 feet. He stated that in his experience this is often a precursor to turbulence.

2 Navigation tracks are over ocean routes that are assigned to flights to separate them from

other overwater aircraft in a non-radar environment. Aircraft report to oceanic air traffic control facilities at fixed reporting points, thus notifying these facilities of their flight progress.

3 The location of blood stains indicate that the passenger may have actually fallen between seats 45F and 45G.

4 Prior to this accident the airplane was scheduled to be sold to a salvage company to be disassembled for its scrap metal value. This sale was to occur approximately one month following the date of the accident. United Airlines decided to place it into salvage storage following the ferry flight from Narita to the United States, rather than repair the interior damage to the cabin.

Pilot Information

Certificate:	Airline Transport	**Age:**	, Male
Airplane Rating(s):	Multi-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Unknown Unknown	**Last FAA Medical Exam:**	
Occupational Pilot:		**Last Flight Review or Equivalent:**	
Flight Time:	10000 hours (Total, all aircraft), 1500 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	Boeing	**Registration:**	N4723U
Model/Series:	747-122 747-122	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Transport	**Serial Number:**	
Landing Gear Type:	Retractable - Tricycle	**Seats:**	
Date/Type of Last Inspection:	Unknown	**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	Unknown
Airframe Total Time:		**Engine Manufacturer:**	
ELT:	Not installed	**Engine Model/Series:**	
Registered Owner:	UNITED AIRLINES, INC.	**Rated Power:**	
Operator:	UNITED AIRLINES, INC.	**Operating Certificate(s) Held:**	Flag carrier (121)
Operator Does Business As:		**Operator Designator Code:**	UALA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	**Condition of Light:**	Night/Bright
Observation Facility, Elevation:		**Observation Time:**	
Distance from Accident Site:		**Direction from Accident Site:**	
Lowest Cloud Condition:	Unknown	**Temperature/Dew Point:**	
Lowest Ceiling:	Unknown	**Visibility**	
Wind Speed/Gusts, Direction:		**Visibility (RVR):**	
Altimeter Setting:		**Visibility (RVV):**	
Precipitation and Obscuration:			
Departure Point:	NARITA (NRT)	**Type of Flight Plan Filed:**	IFR
Destination:	HONOLULU, HI (HNL)	**Type of Clearance:**	IFR
Departure Time:	1200	**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	3 Serious, 10 Minor, 6 None	**Aircraft Damage:**	Minor
Passenger Injuries:	1 Fatal, 15 Serious, 161 Minor, 197 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal, 18 Serious, 171 Minor, 203 None	**Latitude, Longitude:**	

Administrative Information

Investigator In Charge (IIC):	ROBERT P BENZON	**Adopted Date:**	05/14/2001
Additional Participating Persons:	JOSEPH MANNO		
Publish Date:			
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/.		

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