

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

June 22, 1999

SURVIVAL FACTORS GROUP FACTUAL REPORT OF INVESTIGATION

A. ACCIDENT

DATE : December 28, 1997
LOCATION : Over Pacific Ocean
1 ½ hours after departing Narita Japan
AIRCRAFT : B-747-100
AIRLINE : UAL Flight 826
NTSB NO. : DCA.98.MA.015

B. SURVIVAL FACTORS GROUP

Chairman : Nora Marshall
National Transportation Safety Board
Washington, D.C.

Member : Dr. Mitchell Garber
National Transportation Safety Board
Washington, D.C.

Member : Kelli Jones
United Airlines

Member : Fidel Gonzales
Association of Flight Attendants

Member : Maria Armanino
Federal Aviation Administration

Member : John Purvis
Boeing

Member : Michael Dunican
Boeing

Member : Bob Frantz
Airline Pilots Association

C. SUMMARY

At about 2310, Japanese Standard Time, United Airlines Flight 826, a Boeing 747-100 encountered severe turbulence approximately 1000 miles southeast of Narita International Airport, Japan. The event occurred at flight level 330 and the airplane was en route from Narita to Honolulu International Airport, Hawaii. The airplane returned to Narita for an uneventful landing. There were 374 passengers (369 passengers and 5 in-lap infants), and a crew of 19.

Japan's Aircraft Accident Investigation Commission (AAIC) assisted the Safety Board with the investigation of this accident.

D. DETAILS OF THE INVESTIGATION

1. Aircraft Configuration

See Figure 1

2. Cabin Crew Information

2.1 Flight Attendant Training

There were 16 flight attendants assigned to flight 826. Please refer to Attachment 1 for flight attendant training history.

2.2 Flight Attendant (F/A) Interviews

Flight Attendant No. 1
Bruce Ushijima
Purser
L-1 Jumpseat

There were 5 in-lap infants on board the flight. There were 2 language-qualified flight attendants; one working in the upper deck and one working in the back cabin.

The captain gave a pre-flight briefing. When the captain boarded the airplane he told the chief-purser that there were reports of turbulence about 2 hours after take-off. The captain told him that they would stay in contact with a Northwest flight ahead of them and that the captain would let the chief purser know what the Northwest plane reported.

He notified F/A No. 2 about the captain's briefing. The pre-departure safety briefing was an English-speaking video with Japanese sub-titles. He heard the chimes when the seatbelt sign was turned off after take-off.

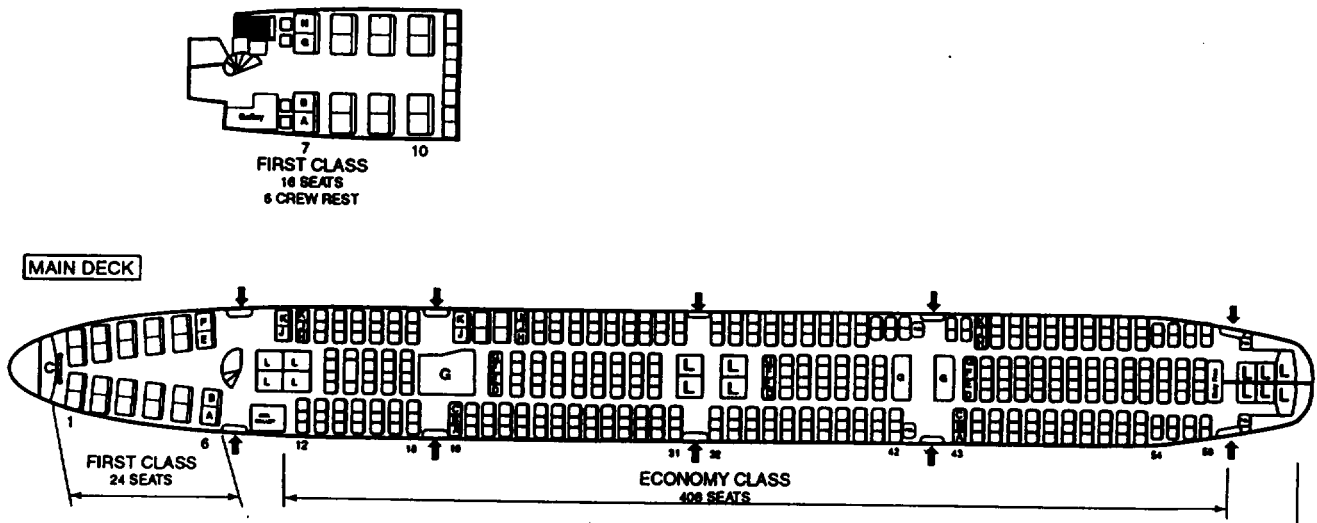


Figure 1

He said that the seatbelt sign was on when the turbulence occurred, but he did not know for how long. He was standing at the 1L Galley when the turbulence occurred. There was a slight drop and he grabbed the countertop. The next thing he knew he was upside down and his feet hit the ceiling. It was like an earthquake, the airplane was "jumping around" for about a minute. F/A Nakatori fell and he asked her if she was okay.

He checked on the upper deck (UD) F/A and then walked around the cabin. There was a woman (who was throwing up) lying on the floor in the aisle just forward of door 2L whose husband said she was okay. He saw flight attendants seated in passenger seats at door 4L and he was told that there was an unconscious passenger. The woman was in the right aisle of E Zone with her head in front of an "G" seat and her legs in front of HJ seats. F/A Kozan was checking the passenger. He checked the passenger for breathing and pulse. She had a slight pulse and her lips were getting blue. He went to get a microshield and told F/A Murakami to make an announcement to ask for a Doctor's assistance. He began giving CPR to the woman as he blew air into the woman he heard "gurgling" and when he released her nose she began to vomit blood through her nose and mouth. She had blood coming from her ears and nose.

A Japanese doctor examined the woman. He asked about oxygen and F/A No. 1 explained the type of first aid oxygen that was on board the airplane. The second officer brought the stethoscope from the medical kit. After the doctor completed his examination, he said "no good, no good." He gave CPR for about 1 hour. The doctor told them once again, "No good." The woman was carried back to the cross aisle at the 5L and 5R doors.

He made several announcements during the flight. His announcements included a description of the service, a movie announcement, instruction to passengers to keep their seat belts fastened outside of their blanket if they went to sleep.

He heard the cockpit make an announcement with instructions to keep seat belts fastened while seated. After the turbulence occurred he made an announcement asking passenger who needed assistance to identify themselves to a flight attendant. He received a list with 35-40 names on it, which he gave to the "Ground Supervisor" after they landed at Narita. There were additional passengers who needed assistance after landing.

When they landed at Narita, medical personnel met the airplane. Prior to landing, he made sure that there was a flight attendant seated at every floor-level exit because injured flight attendants were seated at passenger seats.

Flight Attendant No. 2
Jeff Ikeda

He was the aft Purser (economy section). He was on the right side of the aft service center when he felt an initial rumble, felt a blow to his back and neck area and ended up on the

floor. The turbulence subsided and he heard the captain's announcement. He heard carts hitting walls and debris came into the service center. A cart fell in the service center and landed on some bins. Liquids were "falling on us" and "every bin fell on us." A liquor cart at the 4R door hit the door and then hit the closet. A cart fell on his leg and he was pinned under the cart for a while. It was difficult to pick up but he got out from under the cart and began to assist injured passengers. He saw a female passenger laying in the aisle at row 45 or 46 with her head in front of the G seat. He checked for breathing and pulse and then started CPR. He flashed a light in her eyes but her eyes stayed dilated even when exposed to light. F/A No. 1 began "airway breathing" on the woman and he started chest compressions. A passenger, who was a doctor, came and took over the compressions. The second officer brought the medical kit from the cockpit. They used the stethoscope from the medical kit, but could not detect a heartbeat.

He did not recall if the seat belt sign was on when the turbulence occurred. The weather was "smooth" so he did not expect it to be on. He stated that the purser had done a pre-departure briefing in which he instructed the flight attendants that they might encounter turbulence approximately 2 hours after take-off. He believed that he heard chimes activated three times before the turbulence. He did not see any overhead bins open during the turbulence. He helped clear debris and assisted the second officer in removing and stowing a loose ceiling panel from the right aisle at about row 50.

Flight Attendant No. 3
Gordon Parinas

He was in the forward lower galley pulling an entrée cart out of the elevator when the turbulence occurred. He felt the first "tremor" and he grabbed the counter. The next thing he knew he was lying on his back near the elevator door. He heard the captain's PA announcement instructing flight attendants to be seated. He sat on the galley jumpseat until he felt it was calm. He went upstairs to the main deck and saw Elaine seated in a passenger seat and a woman lying in the aisle in B Zone forward of the 2L jumpseat. A woman in C Zone asked him to "check" her baby. The baby was sleeping and he did not see any signs of injury to the baby but he asked F/A No. 5 (who spoke Japanese) to speak with the woman. He gave a cold compress to a man with a laceration and then he helped put a liquor cart into the aft service center.

When the seatbelt sign was turned off after takeoff, he heard the captain's announcement instructing passengers to keep their seat belts fastened while seated and he heard an announcement in Japanese following the captain's announcement. He could not remember if he heard chimes when the seatbelt sign and/or no smoking signs were illuminated. He stated that the chime was not loud or distinctive. He did remember hearing chimes when the seatbelt sign was turned on for descent.

He thought that a "hand hold" or railing in the lower galley might have been helpful when the turbulence occurred.

He sat at the 2L jumpseat for landing.

Flight Attendant No. 4
Kent Zarbaugh

He was in the aft lower galley when the turbulence occurred. He was lifted off the floor approximately 8 inches and hit the galley ceiling panels and pushed them in. He ended up in the corner of the galley near the jumpseat. He tried to get into the galley jumpseat but had difficulty fastening the seatbelt quickly because of the inertia reel. He heard the captain's announcement for flight attendants to take their seats. He attempted to call the front galley and then called the 4L station. He spoke with "Joey" who instructed him to stay downstairs. He heard an interphone "all call" and heard someone talk to the captain about a woman who was in the aisle and a discussion about whether they should turn around and go back.

He stated that the seatbelt sign was not on prior to the turbulence. He stated that it "was smooth" and there "was not reason for it [the seatbelt sign] to be on."

He said that, following the turbulence, there "must have been a PA" that told flight attendants that they could get out of their seats. He came up from the galley and went into E Zone and noticed that some ceiling panels were "gone" and there were "holes" in the ceiling. He saw people who were "dazed" and had abrasions. He saw approximately 4 passengers who had donned their life vests.

When the turbulence occurred the "only loose thing" in the galley was a suitcase. The suitcase hit his right knee and injured it. His neck and back hurt also. He thought there should have been "hand holds" in the lower galley.

Flight Attendant No. 5
John Murakami

He was working a "coach aisle" position and was seated at 3R for takeoff. He is a Japanese-qualified language flight attendant but was not assigned a language flight attendant position on this flight. When the turbulence occurred he was about 4 rows from the back of C zone on the right side. When the turbulence began he squatted down and grabbed the seat restraining bars on the H and G seats. He was facing aft against the H seat. He "rode it out" and was not injured. Out of his peripheral vision he saw people "tossed out of [their] seat[s]," but he did not see anyone hit the ceiling. A female passenger who had been on his right ended up on top of his back. He said that the seatbelt sign had been on for less than a minute. When the sign came on he was at 2R and he was able to walk to about 4 rows from the back of C zone before the turbulence hit. He walked to the aft Service Center (4 door) and noted that there was about a foot of debris in the Service Center. Passengers wanted to know what happened and he called the cockpit and asked what was going on. He gave them information about the physical damage and injuries. He asked the cockpit if they were going to turn around and was told, "we'll get back to you." He saw the second officer in the aft cabin. F/A Murakami called the cockpit to ask about the decision to return to Tokyo. The cockpit eventually made a PA announcement that they would return to Tokyo.

F/A No. 5 made an announcement in English requesting the assistance of medical personnel and F/A No. 15 translated the announcement into Japanese. He provided first aid to several passengers. He helped a man in row 39 who had a gash on his foot. A doctor examined the man and bandaged his foot. F/A Murakami applied a bandage to a passenger at the left side of the back of E zone (possibly row 51). The passenger's forehead had a cut. Another passenger who was 3 or 4 rows ahead of the person in row 51 had a gash on his right cheek and eyelid. He used a first aid kit and said that it was difficult to use the contents of the first aid kit because it was hard to open the packages with gloves on. He did not think there were enough gloves available because he thought that they should change gloves after each person was bandaged so that blood would not be transferred from one person to another. He also said that the scissors in the first aid kit did not "cut well."

He stated that his 1st aid knowledge about equipment and procedures was gained from the Air National Guard, not United Airlines. He said the "recurrent" first aid training at was "not adequate."

He observed damage to the cabin in D and E zones. The damage was noted at the center bin end cap in D zone. He saw damage to ceiling at door 4 cross aisle in E zone. He observed dented ceiling panels at 4L inboard of raft compartment and the door 4R slide cover had a hole in it. He saw damage to armrests and ceiling panels through out D and E zones. When they were preparing for landing he checked interior to see if anything (i.e., ceiling panels) might come loose on landing. He called another flight attendant to help him take down a loose ceiling panel. He stated that the PA system was "on the weak-side" in D and E zones both before and after takeoff. He heard F/A No. 1's announcement "okay" but the Captain's and F/A no. 15's announcements were "kind of hard to hear." When the seat belt sign came on just before the turbulence, he heard the chime signal while he was at 2R.

Flight Attendant No. 6
Joel Nakamoto

He was in the aisle at 4L when the turbulence occurred. He was lifted upward and hit the ceiling. The airplane yawed and he hit the wall and he didn't see anything until he hit the ground. He could not recall whether the seat belt sign was on. He said that he usually hears a chime when the seatbelt sign was turned on and he did not hear chimes before the turbulence. After the turbulence he heard an announcement for flight attendants to take their seats. He had heard chimes earlier in the flight when they were seated on their jumpseats after take off.

After the turbulence he called the cockpit twice and asked if they were going to turn back because they had critically injured passengers and flight attendants. The cockpit crew told him that they were sort of busy and would call back. The cockpit called back and asked for F/A No. 1 and asked if they needed to turn around. F/A No. 1 instructed him to tell the cockpit that they needed to turn around and land the airplane

He stated that there was a lot of fluid and blood and that he thought that there should be access to gloves through-out the airplane. He also believed that they needed more bandages and a better first aid kit.

He sustained a fracture to "T-10" and a "whiplash" injury.

Flight Attendant No. 7
Diane Vanderzanden

She was working Position No. 7 and was seated at 5L for takeoff. When the turbulence occurred she was in the galley at the aft service center. She was lifted upward and her head went through a plastic panel and into florescent lights. She ended up on the floor and coffee and tea poured down on her. She was bleeding from her nose and F/A No. 2 told her to hold a cloth to her nose and to stay where she was. She sat in seat 43C across from the 4L jumpseat. Elizabeth was seated in seats 43A and B and was in pain. She heard the captain make an announcement for flight attendants to take their seats.

Prior to departing Narita she heard the captain's briefing to the Purser that there may be some turbulence about 2 hours after take off. She also heard the captain instruct the purser that the flight attendants should remain seated after takeoff until the seatbelt sign was turned off. When the sign was turned off she heard the captain make the "routine announcement" that passengers should keep their seatbelts fastened when they were seated. She could not remember if the seat belt sign was on when the turbulence occurred.

She remained seated at seat 43C for the rest of the flight. She told the purser that she would sit at 5L for landing and he instructed her to stay at 43C. She received 9 stitches around her eye, pulled a muscle in her right inner thigh and sustained a laceration to her knee.

Flight Attendant No. 8
Yoko Cahill

She was a Japanese-speaking flight attendant. She was in the upper deck aisle when the turbulence occurred. She was raised upward, dropped a tray, and grabbed the armrest at seat 8G. The turbulence caused everything to come out of the UD galley.

She sat down in seat 9B and "strapped in." She estimated that she sat there for about 5 minutes and then saw the Second Officer (SO) come out of the cockpit and go down the stairs to the main deck.

She cleaned up glasses and china that was piled in front of the cockpit door. She went to the main deck and walked down the left aisle to the aft galley. She told passengers individually that the airplane was okay. F/A No. 1, the purser, asked her to get names of severely injured passengers. She translated into Japanese several of F/A No. 1's announcements. She went down right aisle checking for injured passengers. "Most of front" [passengers] were okay. A woman was injured in row 17, seat B or C. One or two people were injured in C zone. She collected

30+ names of passengers with injuries on 2 sheets of paper. She gave the names to the purser. When she walked to the back of the cabin, some passengers in E zone were wearing life vests.

F/A No. 5 asked her to calm the passengers. She made an announcement in Japanese that the airplane was not going to crash. She explained that the airplane had “dropped” but it was not going to crash and that although there was a hole in the ceiling, the airplane was okay.

Two people in the UD were unbelted when the turbulence occurred; one in the lavatory and a woman in 10B. The woman in 10B came down on the tray table and her tray ended up on the floor. The woman in 10B was not transported from the airplane to the hospital.

When they landed at Narita F/A No. 8 made an announcement that was requested by the firefighters who met the airplane. She asked passengers to let the most severely injured passenger off first and she asked passengers to be patient.

During the flight she heard several announcements. She heard the purser make “Welcome” “Safety” and “Service” announcements. At the top of climb she heard the pilot make an announcement instructing passengers to keep their seat belts on when seated. He also said that it was winter weather and they may experience a tail wind. F/A No. 15 “started” to translate the Captain’s announcement but F/A No. 8 did not hear exactly what she said. The seat belt sign came on once before the turbulence and F/A No. 15 translated the seat belt announcement. F/A no. 8 was in the UD galley and heard the cockpit announcement and the chime associated with the seat belt sign being turned on.

She sat in UD for landing. She had some aches and pains after she got home.

Flight Attendant No. 9
Elaine French

When the turbulence occurred she was at the Service Center at 2R/2L with F/A No. 15. She felt a bump and reached for edge of counter and tried to hang on. Her head hit the ceiling and she heard a loud crash. Coffee poured down on her and she may have “blacked out.” She did not remember what happened until she sat down in the “C” seat in row of passenger seats at door 2L. She tried to put on a seat belt but it was difficult to do so because her left hand was injured. F/A No. 12 sat in the “A” seat of the same row. She did not know if the seatbelt sign was on when the turbulence occurred. After the violent turbulence, she heard the captain make an announcement instructing the flight attendants to sit down. She saw a passenger lying in the aisle forward of the 2L jumpseat. She saw F/A No. 3 come out of the galley and he appeared very shaken. He gave her ice for her injured hand. She heard John make an announcement requesting assistance from doctors and nurses. A male passenger kept trying to get up from his seat and they shouted to him to remain seated.

She walked through C zone and gave ice to 2 passengers. She was stunned by the damage at the 4L door. She saw passengers who were wearing life vests and noted that no one was helping 3 injured flight attendants. She went to the front cabin and tried to clean the service

center. She picked up broken glass and china. She distributed water to passengers. After the airplane landed and was stopped, uninjured passengers exited 2L. Injured passengers went out door 2R. A stretcher that was used was "extremely wide" and could not go down the aisle. Ambulatory injured passengers exited at 2L and walked down the Jetway's stairs.

Flight Attendant No. 10
Lianne Kozan

When the turbulence occurred, she was in the right aisle at row 38. She felt herself go down toward the floor and she grabbed the luggage bars under the "H" seats. She then sat in seat 38H and wedged her legs under the armrest to hold herself down. She did not remember if the seat belt sign was on.

She checked on passengers and found a woman in the right aisle with her head at about row 40 and her feet at about row 41. She helped her to her seat at about 41F.

She was told there was a woman who was unconscious. The woman was lying on her back at row 45. Her shoulders were at about seat 45G and her head was almost to the "F" seat. The woman's husband was seated in the "G" seat right next to her. She checked for a wrist pulse and felt a faint pulse. F/A No. 2 brought a "micro shield which they placed in the woman's mouth.

F/A No. 10 began giving breaths and heard a gurgling sound and saw blood coming from the woman's nose and ears. F/A No. 1 took over breathing and F/A no. 2 gave compressions.

She closed some "super" bins in E Zone after the turbulence, however she did not know if the bins opened during the turbulence encounter.

She did not recall whether the seatbelt sign was on or off when the turbulence occurred, nor did she recall whether she had heard chimes during the flight.

She stated that she had a problem using the gauze from the first aid kit. The items in the first aid kit were covered in plastic "shrink wrap" and she could not open the packages. She tried opening them with gloved hands and she also tried opening the packages after removing her gloves.

Flight Attendant No. 11
Valerie Nagatori

She was standing next to a tray cart at the 1L jumpseat when she felt an initial tremor. She placed her hand on top of tray cart and the next thing she knew she was in the air. Both she and the cart hit the ceiling and then landed on the floor. The cart "missed" her and did not hit her. The service items on top of the cart went forward. She heard the captain make an announcement for flight attendants to stay in their seats. She saw the seatbelt sign come on less than a minute before the turbulence encounter. She did not recall hearing an announcement when the sign went on. When the sign came on she was standing at row 3 and she walked to 1L.

There was a "bar cart" at 1L and the "bins" came out of the bar cart. She heard a language announcement translation for the Purser's welcome announcement.

Flight Attendant No. 12
Amy Erice

She was in the aisle picking up cans and cups about two rows from the L3 door. She felt the initial "hit" and dropped down as low as she could and tried to grab an armrest at a "C" seat. She was thrown upwards. She blacked out and when she "came to" she was forward-facing on top of the chair backs for seats in the E and F positions. Her legs were forward of the seats: the right knee was in seat F and left knee was in seat E. She asked the passengers (a man in seat F and a woman in seat E to "please hold onto my legs" and the passengers complied with her request. She turned around and shouted to passengers, "Seat Belt, Seat Belt, Seat Belt." When the airplane smoothed out she asked two men to help her and she sat in a "C" seat at door 3L. She applied ice to her left ribs.

After landing, she was taken to a hospital with three other flight attendants but the hospital did not have Xray equipment and they were then taken to another hospital where there was a long wait for treatment. She did not get to a hotel until after 6:00 AM. She sustained fractures to her 3rd and 4th left ribs.

She could not remember if the Seat Belt Sign was on when the turbulence occurred. She stated that she thought all of the English announcements had been translated into Japanese. The seatbelt sign had gone on and off previously because she had checked seat belts prior to the meal service and when she was pouring coffee. She stated that she checked seatbelts for the passengers on the left side of Zones B, C, and D and they listened to her when she instructed them to fasten seat belt. For the passengers who did not speak English, she would point to the seatbelt and used a motion simulating fastening the seat belt. She said that most of the passengers had their seat belts fastened when she checked seat belts.

She held the ice to her side as she checked seatbelts for landing as she moved from the passenger seat at 3L to the 2L jumpseat for landing.

Flight Attendant No. 13
Elizabeth Stevens

Her height was 5'-1 1/4". The turbulence occurred just as the meal service was ending. She was walking aft and was just forward of the 4L jumpseat when the floor felt unstable. She began to run toward seat 43A because there were no passengers seated in seats 43ABC. She went toward seat A so that seats B and C seats would be available for other flight attendants. There was a liquor cart positioned between the L4 jumpseat and row 43, and another liquor cart (positioned in a forward to aft direction) in the aisle next to seat 43C. She was standing in front of the seats and reached down for the crossed seatbelt when she was thrown toward the overhead bins. She described the motion as "quick and forceful." Her head hit the oxygen compartment and she heard a "cracking" sound. She momentarily blacked out. Her legs "shot out" over seats

43B and 43C and she fell down in a supine position and hit the armrests. She stated that she landed on two armrests and her hips were the first part to hit the armrests. She then fell to the floor between the carts.

When the carts went to the ceiling, the doors opened and drawers came out. She noted that one of the carts was swaying in a forward and aft direction and she was afraid that the cart would fall on her. She linked her right arm around the seat legs. She noted that a florescent light in the ceiling was broken. With her one good arm and leg she pulled herself into seat 43B and grabbed a seatbelt from 43C and buckled it into the other half of the seat belt from 43B.

She heard a flight attendant make an announcement in Japanese. The flight attendant later explained that she made an announcement that explained that the airplane had dropped 300 meters.

Her neck felt "compressed." She knew that she was hurt and felt like she wanted to lay down on something hard and flat. The captain came by her seat and asked her if she wanted to use the cockpit crew rest bunk. She tried to get up but was unable to do so. A doctor came by and asked her to move her arms and fingers. She was cold because she had been drenched in liquids from the carts and someone put blankets over her.

She asked one of the flight attendants to tell the purser that she would need an "aisle chair" when they landed at Narita. She wanted to call the cockpit to tell them about her injuries but F/A No. 6 talked her out of it. After they landed at Narita she waited 20 to 30 minutes before she was taken off the airplane. She began to lose patience because they would not take her off and kept "passing her by." She was eventually placed in an aisle chair and a United Airlines representative gave her blanket to hide her face from the press. She was taken off the airplane and lowered to the ground in a catering truck. She was transported to Narita Red Cross Hospital in an ambulance. She was told that she had a broken bone in her pelvis and she was hospitalized. She reported that the pain medication that she was taking was not effective. Three days after the accident she was examined by a doctor and was re-x-rayed and told that she had a "broken neck." She was transferred to the hospital at the United States Air Force Base at Yokota, Japan. The Air Force doctor told her that she needed neck and rotator cuff surgery. She was medivaced to Okinawa for surgery. After she was stabilized she was medivaced to Tripler Army Hospital in Honolulu. She was released on January 26, 1998.

Her injuries included C6 and C7 fracture, 4 fractures in her pelvis and a rotator cuff injury.

She did not remember if the seat belt sign was on when the turbulence occurred. She remembered hearing all the "normal announcements" including the cockpit announcement for passengers to keep their seats belts fastened. She said that she would not have been able to determine if that announcement had been translated into Japanese.

Her duties included distributing infant life vests prior to departure. She said that she gave out 6 life vests to passengers seated throughout the cabin. She did not recall seeing child

restraint systems being used. She did not recall hearing chimes before the turbulence, but said that she may not have heard them if she was talking at the time.

Flight Attendant No. 14
Jennifer Simmons

When the turbulence occurred she was in D Zone, about 6 rows from 4L and she was bringing a cart back to the galley. The initial jolt of turbulence occurred and she let go of her cart. She grabbed for an armrest. She missed the armrest and hit her head on the ceiling. The airplane skewed to the right and the left side of her face scraped on the side of a seat. Her neck hit an armrest and then she hit the floor. She grabbed an armrest and stayed down. She tried to stand up and realized that she could not "straighten up."

Because of her injuries, she was unable to help in the cabin after the turbulence. Her injuries included a black eye, a concussion, cervical strain that resulted in a pinched nerve, sprain to both hands and a severe sprain to left index finger. She and three other flight attendants went to a hospital and then were picked up by a United supervisor who drove them to another hospital where they were treated.

During the turbulence she saw a woman on the other side of the cart (off to the left) going up into the air. The woman was wearing jeans and a yellow (or pale) shirt under a dark sweater.

She stated that the purser had given a pre-flight briefing and said that they might encounter turbulence on the flight. She said that the cockpit made an announcement after take-off that other airplanes had reported turbulence along their route. She did not remember if the cockpit crew's announcement was translated. When the seatbelt sign went on prior to the turbulence she thought that she heard a chime but there had not been time for an announcement. She stated that she could not remember for sure whether it was a chime for the seat belt sign or a call chime.

Prior to landing the purser came around and asked her if she would be able to open a door if needed. She said yes. For landing she sat at door 4L, outboard.

Flight Attendant No. 15
Miyoko Inada

She was a Japanese-speaking flight attendant and she worked in economy class. She was one of the "language flight attendants" on the flight and she was responsible for translating announcements during the first half of the flight. She translated announcements by F/A No. 1 and the pilots. The pilot made an announcement to the passengers that they might encounter turbulence during the flight but that it was nothing to worry about because turbulence was normal at that time of the year. The pilot's announcement was lengthy and different from the usual announcement that pilots made recommending that passengers keep their seatbelts fastened when seated even when the seatbelt sign was turned off. She did not know if she should translate the entire announcement because she was concerned that she would "scare" the passengers. She did

not make an announcement in Japanese recommending that passengers keep their seatbelts fastened while seated. She stated that she asked F/A No. 1, the Chief Purser, if she should translate the entire announcement. There was no answer and she returned to the R2 door. The seatbelt sign was turned on shortly after that and she made an announcement that the seatbelt sign was turned on by the captain and instructed passengers to remain seated with their seatbelt fastened. When the turbulence occurred she was thrown to the floor (but did not hit the ceiling) between 18H and the 2R jumpseat. She sat on the floor and then took a passenger seat.

She made an announcement in Japanese for passengers to remain seated. She also translated into Japanese an English announcement requesting the assistance of a doctor. When a doctor came to her she took him to the back cabin. She and a doctor walked down the right aisle from about the middle of C Zone to the back of the airplane. When they got to the back cabin F/A No. 5 asked her to make a short announcement that they were okay. She translated an announcement explaining the cause of turbulence (jet stream) and that they would be returning to Narita.

She gave ice to passengers who complained about neck pain. F/A No. 1 asked her to determine how many passengers were injured and how many passengers would need an ambulance when they landed at Narita. She and the doctor determined that at least 10 persons on the right side of the airplane would need medical assistance after landing. She prepared a list of passengers who were injured and gave it to F/A No. 1.

Flight Attendant No. 16
Amy Cerelejia

She was a Japanese-speaking flight attendant. She was in E zone (about row 47) on the right side picking up trays when the turbulence occurred. The first "bump was pretty severe" and she sat down on floor and grabbed an armrest. She was tossed into the air and might have hit a ceiling panel. She came back down and hurt her right arm. She observed a woman in front of her lying between rows 44 and 45, seats F and G and the woman's husband was trying to wake her. She saw that the woman had blood coming from her eyes and her lips were turning blue. F/A No. 16 sat at the 4R door and someone gave her ice to put on her sprained ankle and Rodney gave her sling for her arm. She did not recall if the seat belt sign was on when the turbulence occurred. She said that most passengers were seated in E zone when the turbulence occurred.

Please refer to Attachment 2 for Flight Attendant Reports.

3. Passengers

Safety Board investigators did not interview passengers. The AAIC sent questionnaires to 358 passengers who lived in Japan. The AAIC received responses from 310 persons. Of those passengers who responded to the questionnaires; 160 passengers stated that their seat belts were fastened, 129 reported that their seat belts were not fastened, 18 reported that they were not seated, and 3 passengers did not answer the question.

An english-speaking passenger seated in Zone A, Seat 5B, provided a statement to his employer and the statement was provided to the NTSB.

See Attachment 3 for AAIC summary of questionnaires and passenger statement.

4. Aircraft Cabin Damage

The airplane's cabin was examined in Las Vegas, Nevada, on January 7-8, 1998. The following damage was noted:

4.1 Armrest Damage

B Zone

- 13H - Aisle armrest deformed outboard $\approx 1''$
- 15F - Deformed downward slightly; trim panel partial separation
- 15G - Outboard armrest deformed downward; outboard trim panel torn; inboard rivet sheared; inboard armrest bent inboard and slightly downward
- 17A - Armrest shroud broken
- 17D - Armrest between 17D&E deformed inboard $\approx 2''$

C Zone

- 25F - Armrest loose; trim panel separated left side
- 26D - Aisle armrest-bent slightly downward
- 27D - Aisle armrest-deformed downward $\approx 1''$ and outboard. Aisle trim panel separated from armrest cap
- 27J - Twisted, bent and cracked armrest

D Zone

- 33C - Aisle trim panel pulled away. Armrest was loose when moved laterally
- 35H - Aisle armrest deformed outboard $\approx 2''$
- 35J/K - Armrest between seats J & K deformed $\approx 2''$ outboard
- 37H/J - Deformed outboard and downward to seat cushion; trim panel from outboard H side of armrest was separated.
- 38C - Aisle armrest deformed downward to seat cushion level
- 38D - Left armrest deformed downward and inboard
- 40D - Left armrest deformed downward and inboard $\approx 2''$. Side trim panel popped
- 40K - Outboard armrest deformed downward and inboard
- 41B/C - Armrest between seats B & C deformed downward and inboard
- 41C - Aisle armrest deformed downward and outboard $\approx 2''$
- 42B/C - deformed downward $\approx 2''$ and slightly inboard

E Zone

- 43J - Aisle armrest deformed inboard $\approx 1\frac{1}{2}$ "
- 45F - Left armrest deformed toward F seat cushion
- 46G - Right armrest deformed inboard
- 47K - Aisle armrest crushed and broken
- 48G - Armrest deformed downward to cushion and inboard ≈ 2 "
- 48H - Aisle armrest deformed downward to seat cushion and slightly outboard; aisle trim panel separated
- 49C - Armrest between B and C seats deformed inboard 1" and down $\frac{1}{2}$ "
- 49H - Left armrest deformed downward and outboard 3"
- 50D - Aisle armrest deformed downward and inboard slightly
- 51D - Aisle armrest arm cap had indentation near rear of cap
- 51G - Right armrest deformed downward 1"
- 52D - Deformed inboard ≈ 1 "
- 54A/B - Twisted and deformed inboard; arm cap dented
- 54D - Aisle armrest deformed downward to seat cushion
- 54H - Aisle armrest deformed downward and outboard $\approx 1\frac{1}{2}$ "
- 55B/C - Deformed downward $\approx 1\frac{1}{2}$ " and slightly inboard
- 55C - Aisle armrest cap missing
- 55D - Aisle armrest deformed downward to cushion and inboard ≈ 2 "
- 55D/E - Deformed downward slightly and audio controls damaged
- 56D/E - Deformed downward slightly and inboard 1"
- 57G - Aisle armrest deformed downward and outboard ≈ 2 "; aisle trim panel separated.
- 57H - Armrest deformed outboard approximately 2" and downward

4.2 Seat Backs and Seatbelts

- 14A - Seatback outboard lower attach fitting not secured
- 44J - Right seatback pin (PN94654-2) sheared at casting
- 53D - Upper seatback twisted ≈ 2 "
- 53H - Seat back bent aft approximately 2" and would not go into fully upright position
- 36C - Right seatbelt came loose from attach point when latched belt was pulled. No damage noted.

4.3 Ceiling Panels

- See ceiling diagrams in Attachment 4.

4.5 Damage to overhead panels

B-Zone

- Unable to open center stowage bin above 13GF
- Cove light panels Seats 12, 14, 15, ABC-taped up; 13K-17K taped up
- Dark hairs in seatbelt light panel above seat 17B
- 14 DEFG⁰₂ panel taped closed

C-Zone

- Oxygen panels above row 21 center seats taped on both aisles
- Row 20-22 HJK seats Passenger Service Unit (PSU) spacer panels taped up
- There is a gap between spacer panel (PN65B54016-1) forward of 25D-G and the spacer panel is fractured.
- Bottoms of stowage bins at seats 23A-C; 24A-C; 25A-C; and 26A-C are creased.
- 10-12" dark hair caught in light panel above seat 26A.
- 1 ½" dent in sidewall panel at seat 27A approximately 26" below cove light.
- 3/4" dent on bottom of stow bin above 26D and 26E
- Ceiling light in cart stowage area aft of center seats at row 29 was pushed up 1"
- Lavatory J (between doors 3R and 3L)
 - Fractured plastic light cover above mirror
 - Florescent tube connector was broken at inboard connector and dislodged at outboard connector
- Lavatory L (between doors 3R and 3L)
 - 4" hair lodged between ceiling and light cover

D-Zone

- Damage to stowage bin end cap (UAL drawing 6F 14986-2) above 37 center seats; hair strands noted in that area
- Seat 37F tray table bent downward 3"
- 37K - PSU light assembly fractured; PSU⁰₂ panel fractured
- Gasper vent panel fractured and strands of hair noted
- 39G - scuff mark on back of left side of tray table; dark fluid stain on carpet; cracked gasper air panel with dark hair attached
- 40J - Slight buckle (≈6") and delaminating to fascia bottom of overhead bin
- 41J - 3 ½" x 1 ½" elliptical dent in panel
- 41K - Dark hair strands lodged in spacer panels; light panel displaced downward, PSU rail closure displaced downward
- 42K - Spacer panel missing above 42K
- 41A - Light assembly pushed in and long strands of dark hair attached
- 42A-C - Strands of hair in gasper air vent

E-Zone (Left side)

- 44ABC - O₂ panel/gasper air panels damaged
- 48A and 49A – cove light shroud was loose
- 49ABC - O₂ panel/gasper air panels damaged and light assembly
- 50ABC - O₂ panel and light assembly damaged
- 51ABC - Light assembly panel damaged
- 55C – Spacer panel dented and delaminated; 30” crease in panel in forward to aft direction from rows 55 to 56.
- 56C – Spacer panel dented and delaminated; 30” crease in panel in forward to aft direction from rows 55 to 56.
- 58C – crease in overhead bins above seat; damage to light shroud

E Zone (Center)

- 45F – Video projector above seatback had black scuff mark on video shroud; 5” crack in PSU panel; spacer panel cracked
- 46F – Seat back pushed forward 4”; armrest deformed and crushed and small amount of dark fluid on top of end cap; PSU spacer panel missing 4” aft of video projector
- Stain in aisle carpet between seats 46 and 47G
- 47K – seat back pushed forward 2”
- 47 DEFG - O₂ panel hanging down 1/8”
- 49 DEFG - Stow bin end cap damaged and missing
- 51E - Under stow bin damaged; dented and cracked by release handle
- 52G - Under stow bin damaged; dented and cracked.
- 53EF - Light assembly damaged
- 53G - Under stow bin forward inboard corner dented
- 55EF - Spacer panel broken
- 56E - Under stow bin damage dented at center of bin
- 56DEFG - No smoking fasten seatbelt light cracked but was operational
- 56G - Under stow bin damage - dented center of bin
- 57F/G – Overhead bin separated; release hand pushed into bin and blood was observed on inside and outside of release handle; closure panel broken off; endcap support broken off and clam shell separated; forward snubber connection sheared at clevis
- 58DEFG - All section spacer panels broken or missing

E-Zone (Right side)

- 45 to 47 HJK – Spacer panel dented and creased
- 46J – Dent in spacer panel
- 46K - Spacer panel broken and a light assembly cracked
- 48 to 49HJK - Cove lights and cove light panels broken

- 48H - Dent in bottom of stow bin
- 50H - 3" crease in center of spacer panel
- 51HJK - Light assembly. spacer broken, cracked, gasper air also
- 51 & 52HJK - Stow bin creased down entire length of panel (approx. 36")
- 54HJK - Light assembly cracked - spacer panel pushed in.
- 55J - Crack aft corner of 02 Panel
- 55HJ - 57HJ - Stow bin creased entire length of panel approximately 36"
- 57HJ - 12" crease in spacer panel in an inboard/outboard direction
- Row 56 sidewall liner 3" crease in aft upper corner

4.6 Galleys

Forward Galley – (IL)

- IL Lowered ceiling - Wire access panel deformed

Upper Deck Galley – (UD)

- No damage noted

Mid Galley – (2L/2R)

- Forward galley module - Latching mechanism broken on 3rd drawer down, right side
- Aft galley module - Close-out seal pulled away on right upper corner
- Aft galley module - Left galley cart missing or removed

Forward Lower Deck Galley (LDG)

- Forward overhead light panel opaque cover - bowed upward 1 ¼"; bowed horizontally 30"

Aft Galley – (4L/4R)

- Soft floor panel - center floor
- Light fixture pan over left galley entry - two ballast and lights damaged/light cover missing
- Five potted inserts (inboard side of light pan) pulled out from ceiling panel - light fixture pan pulled out from ceiling panel over left galley entry
- Ceiling around light pan broken, cracked and distorted on forward and aft edges over left galley entry
- U-Channel supporting left entry ceiling panel is severed (Reference: U-Channel supported by angle - P/N:65B52995-5)
- Two support arms attached to U-channel are twisted (Ref.: P/N 15F6852-25)
- Inside cover of 4L lowered ceiling panel Ref.: 65B52927-375
 - Interior door is cracked and delaminated (door allows access to personnel lift and galley cart lift main electrical control boxes)

- Exterior door is smashed upward approximately six inches
- L-Shape Trim - forward side of 4L aisle, lowered ceiling door bowed upward (approximately 6" W x 24" L x 2"D)
 - Small crack on forward radius 3" long
- Puncture in 4L aisle pillow/blanket stowage bin H16
- 4L aisle closet (aft galley module) forward closet door has puncture and scrape in upper right corner
 - Puncture and scrape ¼ way down near forward closet door hinge
 - Aft closet door does not open
- L shape trim on aft side of lowered ceiling door in 4L aisle; scraped and pushed upward 2" and upper right corner delaminated
- Overhead ceiling light panel opaque cover - forward edge bowed 1"
- Aft galley module closure seal dislodged
- 4R aisle ceiling panel #15 - punctured and cracked on forward side
- 4R aisle ceiling panel #17 - punctured and cracked on aft side
- Aft galley module - 3 galley carts missing or removed

Aft Lower Deck Galley (LDG)

- Forward left light opaque cover - bowed one inch upward on trailing edge; bowed on forward edge - 2 ½" upward

Door 5 Cart Housing - L5/R5

- No damage noted

4.7 Doors

No damage was noted at doors 1L, 1R, 2L, 2R, 3L, 4L, 5L and the upper deck crew service door. The damage at doors 3R, 4R and 5R is described below:

3R Door

- ½" gap on upper right aft side of slide bustle

4R Door

- Door recess light housing - smashed and delaminated
- Puncture on slide bustle (upper aft side)
- Aft side of slide bustle- locking mechanism pulled out of slide pan cover

5R Door

- Evacuation slide dropped out of slide bustle assembly; five inches of slide material resting on carpet

4.8 Communication Systems

PA System

The PA system operated from all cockpit and F/A stations except the 3R F/A station.

FASTEN SEAT BELT/NO SMOKING SIGNS

- All illuminated during check except where damage was noted above seat 56F and 37EF
- Lavatory Signs (Return to Seat indication when Seat Belt Sign is illuminated)

All lavatory "Return to cabin" signs illuminated. Two different types of lighted signs were noted in the lavatories; pictorial symbols or "Return to Seat" signs. Lav J – "Return to Seat" Sign was damaged.

Chimes

Activation of Seatbelt and no smoking signs did not activate chime during tests. The PA1 amplifier module identified below was removed.

United ID No. MR 23314 Dash No. 336
 Collins Serial No. 2458
 PN 522-4538-002
 Type No. 346D-1B
 TSO C-50A
 UAL Mod. Chg. Status: 1-4 dots missing and 5-12 dots still present

On January 8, 1998 PA-1 amp removed from N4720U and installed. The unit is identified below:

United ID No. MR 23314 Dash No. 2012
 Collins Serial No. 4303
 PN 622-4096-001
 Type No. 346D-2B
 TSO C-50B
 Mod level 17

When the second unit was installed, chimes operated when Seat Belt Sign/No Smoking was turned on and off. The original unit was replaced the chimes did not work. See Attachment 5 for results of the amplifier tear down.

5. Medical

Japan's Aircraft Accident Investigation Commission (AAIC) provided passenger injury information which differed from injury information provided by United Airlines. (See Attachment 6 for injury information from AAIC and United Airlines) The injury chart below cites injury information provided by AAIC. 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. Flight attendant injury information was provided by flight attendants during their interviews. See Attachment 6 for injury information.

5.1 Injury Table

	Flight Crew	Cabin Crew	Passengers	Others	Total
Fatal	0	0	1	0	1
Serious	0	3	20	0	23
Minor	0	10	156	0	166
None	3	3	197	0	203
Total	3	16	374	0	393

The passenger who sustained fatal injuries was seated at 46F. Based on postmortem examination, the local police determined that the cause of death was "traumatic intracranial hemorrhage," however, an autopsy was not conducted. Japan's AAIC interviewed the husband of the woman who sustained fatal injuries. He stated that his wife was seated in seat 46F without her seatbelt fastened. He was seated in seat 46G without his seatbelt fastened.

6. Miscellaneous

The pre-departure video briefing included a statement that passengers should keep their seatbelts fastened while seated. (See Attachment 7 for transcript)


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