NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

February 9, 2016

SURVIVAL FACTORS

Survival Factors Group Factual Report

DCA15FA085

A. ACCIDENT

Operator:	Delta Air Lines
Location:	LaGuardia Airport, New York, New York
Date:	March 5, 2015
Time:	1102 eastern standard time[1]
Airplane:	Boeing MD-88, registration N909DL

B. SURVIVAL FACTORS GROUP

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[1] All times are eastern standard time (EST) and based on the 24-hour clock unless otherwise noted.

C. SUMMARY

On March 5, 2015, about 1102 eastern standard time (EST), a Boeing MD-88, N909DL, operating as Delta Airlines flight 1086, was landing on runway 13 at LaGuardia Airport, New York, New York, and exited the left side of the runway, contacted the airport perimeter fence, and came to rest with the airplane nose on an embankment next to Flushing Bay. The 127 passengers received either minor injuries or were not injured, and the 3 flight attendants and 2 flight crew were not injured. The airplane was substantially damaged. Flight 1086 was a regularly scheduled passenger flight from Hartsfield-Jackson Atlanta International Airport (ATL) operating under the provisions of 14 Code of Federal Regulations (CFR) Part 121. Instrument meteorological conditions (IMC) prevailed, and an instrument flight rules (IFR) flight plan was filed.

D. DETAILS OF THE INVESTIGATION

A survival factors group was formed on April 6, 2015. Interviews were conducted with the flight attendants (F/A), Delta Air Lines (DAL) personnel, and a Federal Aviation Administration (FAA) cabin safety inspector (CSI) assigned to DAL. Flight attendant training and DAL manuals were reviewed, and records were collected.

1.0 Airplane Configuration

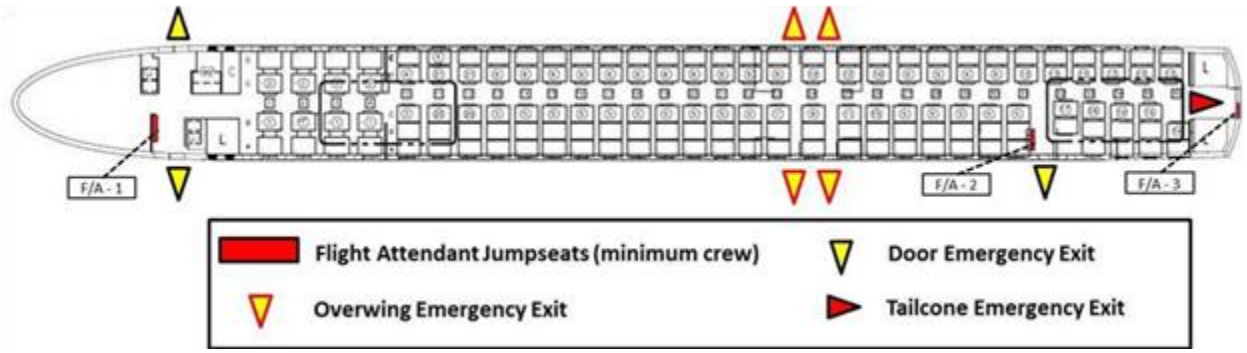

Figure 1. Interior diagram of N909DL showing emergency exits and F/A positon locations

2.0 Airplane Documentation

Refer to the Airworthiness Group Chairman's Factual Report for a description of the airplane and accident site.

3.0 Crew Information

Statements were obtained from the three flight attendants, which are included as attachment 1. Flight attendant training records are included as attachment 2, and flight attendant schedules are included as attachment 3.

3.1 Cabin Crew Information

Position	Date of Hire	Initial Training Completion	Last Recurrent Training
F/A 1 (Flight Leader)	10/31/77	11/23/77	2/13/15
F/A 2	2/26/14	3/25/14	8/25/14
F/A 3	8/25/90	UNK[2]	8/14/14

3.2 Cabin Crew Assignment and Jumpseat Location

F/A 1 - Flight Leader

The flight leader, who was 60 years old, had been continuously employed with DAL since October 31, 1977. On June 10, 2008, she qualified as a flight leader (FL)[3]. She was off duty on March 4, 2015, the day before the trip began; however, she commuted from West Palm Beach, Florida, to ATL that day so she could be ready for the flight the next day. F/A 1 occupied the flight attendant jumpseat at the main cabin door (1L).

F/A 2

F/A 2, who was 38 years old, had been continuously employed with DAL since February 26, 2014. She had been previously employed with DAL as a flight attendant from November 1, 1998 to December 31, 2006, during which time she qualified as a FL. She was off the day before the accident flight. F/A 2 occupied the flight attendant jumpseat at the 2L door.

F/A 3

F/A 3 was 49 years old. She was employed as a Northwest Airlines flight attendant on August 25, 1990, and became an employee of DAL after Northwest Airlines and DAL merged. She finished a trip the day before the accident flight; and had 12 hours of rest between the two trips. F/A 3 occupied the aft tailcone jumpseat.

3.3 Cabin Crew Interviews

The F/A interviews were conducted in Atlanta, Georgia, on April 22, 2015. All of the group members were present for the interview. Interview summaries are included as attachment 4.

[2] F/A 3 received initial training at Northwest Airlines, prior to its merger with DAL. Due to a recordkeeping error, F/A 3's initial training completion date could not be determined.

[3] Flight Leader (FL) was a flight attendant specifically trained in the duties and responsibilities of a purser or flight lead.

4.0 Accident Narrative[4]

The accident occurred on the first flight of a 3-day trip for the flight attendants (see attachment 3).

A passenger seated in a window seat at row 33, aft of the left wing described the landing and subsequent runway departure as "not being violent" but stated that he felt they "were in a very dangerous situation." The F/As described the landing as "feeling different," as though it was not controlled, and one described the airplane coming to rest as it "just stopped, not severely or abruptly, but just stopped, almost gentle."

The F/As shouted the commands "stay seated, stay calm." A passenger pointed to the middle of the cabin, and F/A 1 unbuckled her restraint and moved toward the middle cabin where the passenger had pointed. She found a female passenger who appeared to be crying but was not injured.

F/A 2 remained buckled in her jumpseat. She did not hear anything from the flight deck or from the FL. She tried to use the interphone to reach the flight deck and the FL but was unable to because the airplane had no power[5].

At the tailcone, F/A 3 was shouting commands to "stay seated, stay calm." She stated that it felt like a long time while waiting for a command from the captain. Hearing none, she unbuckled from her jumpseat and began to check on passengers. F/A 2 and F/A 3 both walked forward to the front of the cabin, informing passengers to stay in their seats and to stay calm.

When the captain came out of the cockpit, F/A 1 returned to the area of the forward flight attendant station to speak with him. He asked if the forward exits were usable. She had seen water outside the left-side windows, and advised that the forward doors were not going to be available.

As F/A 2 and F/A 3 approached the front of the cabin, they saw the water and the damaged left wing for the first time. F/A 3 told the captain she had assessed the overwing window exits as she walked forward and determined the right side was usable. He asked about the tailcone, and she said, "I don't know."

Because all of the flight attendants were in the front of the cabin and no one was monitoring the aft cabin, F/A 2 decided to return to the back of the cabin. As she walked aft, a passenger stopped her and pointed to a first responder that was motioning for him to open the

[4] F/A interviews and passenger statements (attachments 4 and 5) were used to develop the accident narrative.
[5] According to interviews with the first officer, the engines were shut down during the excursion causing the airplane to lose electrical power. The flight crew reportedly attempted to switch to emergency power without success.

overwing window exit. She told the passenger "no, we need to wait until our captain instructs us to evacuate."

The captain told F/A 1 and F/A 3 they needed to prepare to evacuate. As F/A 3 returned to the aft cabin, she noticed passengers on cell phones and began shouting, "Get off your cell phones right now, we need to evacuate, we need to prepare to evacuate, you need to listen to us, get your coats on."

The captain handed F/A 1 a megaphone and told her to begin an evacuation. Using the megaphone, she told the passengers they were going to evacuate. She told them they needed to put on their coats and, because she did not know how slippery the wing would be; and she told passengers wearing high heels to remove them. Even though F/A 1 was using the megaphone, the passengers in aft cabin could not hear her. She moved closer to the overwing exits and told passengers they were to evacuate using the right-side overwing exits. She told the passengers seated there to open the overwing exits and put the exit hatches on the seats. The passengers opened the right-side overwing exits and began to evacuate. F/A 1 asked for assistance from able-bodied passengers to stand outside and help people off the wing.

Firefighters were standing on ladders at the wing "yelling at passengers to hurry and get away." A firefighter told F/A 1 fuel was leaking under the left wing. She did not want to panic passengers, so she moved them along as fast as she could. She directed older passengers and children to the back tailcone as she thought it would be easier for them to exit there. It was not until she exited the airplane that she realized the tailcone had no slide.

When F/A 3 opened the tailcone, she "saw water" and immediately closed the door, assuming it was unusable. With the megaphone, she commanded "bad exit, go forward!" A passenger pointed out the water might have been from a firefighter's hose. She opened the exit again and could "see snow, but no slide." She gave the megaphone to a passenger and told him to "keep people back until I get the slide." She proceeded down the catwalk, lifted the slide cover handle, and pulled the manual inflation handle. At this time, the firefighters were yelling at her to "jump" but she remained on the catwalk. Once she pulled the inflation handle she heard the slide "explode," but she could see not see it. She did not understand the attitude of the airplane at the time and that the slide had inflated under the airplane. She commanded passengers to come to the edge of the tailcone, sit down, and jump to the ground.

The passengers who exited through the tailcone were instructed to leave all of their belongings, except for their jackets. A passenger discussed with other passengers whether to take their computer bags and agreed that they should. They felt "slightly guilty" about this decision. They agreed to leave the overhead luggage, even though they knew they "would not be seeing luggage anytime soon."

The lavatories were checked by F/A 1 and F/A 2, and F/A 1 told the captain everyone had evacuated. F/A 2 and F/A 3 exited out of the tailcone together. It was then F/A 2 also realized there was no slide for passengers to use. F/A 1 and the flight crew also exited out of the tailcone.

Most passengers were already on shuttle buses by the time the F/As exited the airplane. They were put on the same bus as the passengers before being taken off and put on another bus with the flight crew. The airport police asked for their identification and for the passenger count. Like most other flights, F/A 1 had ripped off the top portion of the departure report, which contained a passenger count, and had placed it in her pocket[6].She gave the top portion of the report to the police.

5.0 DAL In-Flight Service Onboard Manual

Excerpts from relevant sections of the DAL In-Flight Service Onboard Manual (OBM), dated March 1, 2015, are included as attachment 6.

5.1 Emergency Procedures

DAL's OBM contained F/A procedures for planned and unanticipated in-flight emergencies. Unanticipated emergency procedures instructed flight attendants to immediately return to their jumpseat, secure the airplane for landing, shout commands, and follow instructions from the flight crew to evacuate the airplane. The OBM stated unanticipated emergencies usually occurred during taxi, takeoff, and landing with little warning.

The OBM contained procedures for two types of anticipated in-flight emergencies: a yellow emergency and a red emergency. A yellow in-flight emergency existed when

- the captain anticipated the landing would be successful and would not cause injury to passengers and/or damage to aircraft,
- an emergency landing was not anticipated,
- the emergency evacuation decision would be made after landing, or
- aircraft rescue and firefighting equipment may be required.

A red emergency existed when

- the captain anticipated the landing may cause injury to passengers and/or damage to aircraft,
- an emergency evacuation was probable, or
- when an aircraft rescue and firefighting equipment was required.

An in-flight red emergency was initiated by an emergency signal: three chimes repeated as necessary. Either a pilot or a flight attendant could initiate this signal. During a red emergency, the flight attendants would prepare the cabin for an emergency landing/ditching evacuation.

[6] A departure report was generated by DAL airport customer service agents and provided to flight attendants prior to every flight. The reports contained specific information pertaining to the flight including, but not limited to, the expected totals of passengers, lap-held infants, unaccompanied minors, special assist animals, and special assist passengers.

5.2 Evacuation Procedures

According to "Chapter 3 - Emergency Procedures" of the OBM, F/As were to begin an evacuation when the captain commanded, "This is the captain. Evacuate! Evacuate!" The flight crew could also state which exits were to be used in the evacuation. F/As were also instructed to wait until the aircraft came to a complete stop and if at any time the flight deck crew announced, "This is the captain, remain seated with your seat belt fastened," F/As should not evacuate and shout, "Stay seated! Sit down! Stay calm!" and await instructions. The OBM also stated that F/As should operate under the premise "no doubt, get out," which gave the F/As the authority to initiate an evacuation if the conditions were life threatening[7].

Once an evacuation order/decision was made, the F/As were to assess the safety of their assigned exits. If it was safe to open an exit, the F/As were to open the exit, hold the assist handle, shout "Come this way! Leave everything!," and evacuate passengers in their respective areas. If it was not safe to open the exit or if the exit was inoperable, the F/As were to redirect passengers to alternate exits and use the commands "bad exit," "go across," "go forward," or "go back," as necessary.

The OBM also stated that if there was "no immediate danger after 30 seconds do not evacuate; the flight leader will contact the flight deck crew and advise F/As." The OBM contained no written procedure or guidance for F/As to stay at their assigned exits during an unusual event or prior to a potential evacuation.

6.0 Communication

6.1 Communication Equipment

Title 14 CFR 121.318 and 121.319 required all passenger-carrying airplanes with more than 19 seats to have a public address (PA) system and an interphone system. The PA system enables the airplane crew[8] to disseminate safety information to the passengers and to initiate evacuations. The interphone system provided a method for the crewmembers to communicate with the cockpit or any passenger compartment without having to leave the immediate area. In addition, 14 CFR 121.309 (f) required each passenger-carrying airplane to have portable battery-powered megaphones readily accessible to the crewmembers assigned to direct an emergency evacuation. The megaphones were to be installed at the forward end of the airplane and the most rearward location where it would be readily accessible from a normal flight attendant seat.

The locations of the two megaphones on the accident airplane are shown in figure 2.

[7] The OBM does provide a definition for "life threatening"
[8] The use of the word "airplane crew" and "crewmembers" refer to flight crew and/or flight attendants respectively.

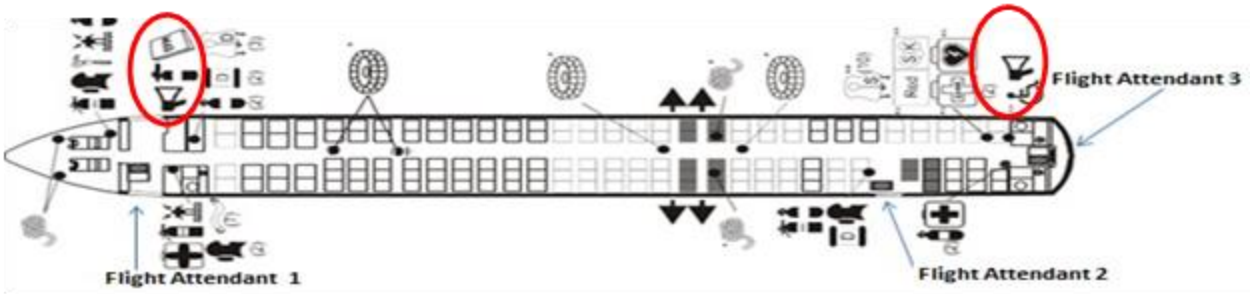

Figure 2. Interior diagram of N909DL showing megaphone locations and F/A position locations.

6.2 Communication Procedures

"Chapter 7 - Aircraft" of the OBM stated that megaphones were provided for use in an emergency; however, it did not address procedures for communicating in an emergency or aircraft evacuation when the interphone or PA was inoperative.

The DAL minimum equipment list (MEL) stated that, if an interphone was found to be inoperable during preflight, at least 50% of cabin interphones must be operative and located at operative jumpseats. For example, if there were three interphones on an airplane, at least two were required to be operative.

The OBM stated, if the PA becomes inoperable during the flight, the flight leader is required to notify the captain and to establish alternate methods of communication. Individual briefings, small group briefings, or the use of the megaphone were examples of alternate methods of communication.

7.0 Inflight Training

7.1 Training Overview

After being hired, DAL F/A candidates were required to complete an approved initial training program. Initial and recurrent training at DAL[9] was conducted under the advanced qualification program[10] (AQP). The initial flight attendant training program was 7 weeks and was primarily accomplished through a variety of electronic learning (eLearning) and instructor-led modules. The recurrent training program was also accomplished through eLearning and 8 hours

[9] DAL refers to their recurrent training program as "Flight Attendant Continuing Qualification."
[10] The Advanced Qualification Program (AQP) is a voluntary alternative to the traditional regulatory requirements under CFR 14, Parts 121 for flight attendant training. Under the AQP the FAA is authorized to approve significant departures from traditional requirements, subject to justification of an equivalent or better level of safety. The program entails a systematic front-end analysis of training requirements from which explicit proficiency objectives for all facets of flight attendant training are derived.

of instructor led modules. The training was conducted in training centers at ATL and Salt Lake City, Utah.

7.2 Emergency Management and Evaluation Training

DAL provided 68 hours of instructor-led emergency management and evaluation training in initial flight attendant training and 19.5 hours in recurrent training. The overall summary, including the course objectives and modules, are listed in attachment 7 to this report. During these emergency management modules, situational awareness, safety, communication and crew coordination, workload management, planning and decision-making, and threat and error management skills were evaluated.

DAL did not conduct joint flight crew/cabin crew communication and coordination exercises about evacuations and decision-making. However, F/A proficiency drills were conducted using taped crash sounds that included pilot commands. For example, if a flight attendant heard "this is the captain, evacuate, evacuate," the flight attendant would begin shouting his/her commands and if exit is usable, open exit, and begin evacuation or, if the exit is not usable, block and redirect. There were no scenarios involving a loss of communication.

In addition to the instructor-led emergency management and evaluation training, 14 hours of instructor-led training was provided on medical emergencies, 11.5 hours on security, and 62.5 hours on aircraft qualification. DAL also included 15.5 hours of computer-based training on inflight scenarios and aircraft specifics.

Recurrent training consisted of 11.5 hours of eLearning and 8 hours of instructor led modules. The modules are included as attachment 7 of this report.

8.0 FAA Cabin Safety Oversight

At the time of the accident, there were two FAA cabin safety inspectors (CSI) overseeing the DAL flight attendant program.[11]The FAA monitored in-flight training monthly and, according to an interview (attachment 8), one CSI characterized the quality of DAL training as "superb." The CSI stated AQP was a better training program than "traditional hours training" as required by 14 *CFR* Part 121 subparts N and O[12]. The CSI categorized the accident at LGA as a "non-normal" event. She stated this accident was a "unique situation" and mentioned the accident scenario would make a good training exercise. The CSI expected flight attendants to stay at their door position locations during emergencies but also remarked they are taught situational awareness to use their best judgment under any circumstance. She stated the cockpit- to-cabin communication was heavily trained and emphasized in both the flight attendant programs and flight operations training.

In Chapter 33 – Cabin Safety and Flight Attendant Management, of the FAA's Inspector Handbook, some emphasis on time management and crew coordination for impeding emergency landings had been established. For example, guidance stated that CSIs should ensure that their

[11] One CSI was considered to be primary in certain areas, and the other CSI was a considered to be secondary.
[12] Training requirements outlined by hours in the Code of Federal Regulations.

assigned air carrier's training department reviewed the accident scenario of United Airlines Flight 232. The lessons learned in that accident provided F/A's, who were required to act in rapidly changing emergency conditions, with knowledge of the air carrier's policies and procedures. Guidance was also provided for training, that in a crash scenario, air carriers should emphasize the need for F/As to stay restrained during a crash and the need to determine suitable exits, however, the handbook did not contain guidance to ensure F/As stayed at or near their duty stations in the event there was a need for a rapid evacuation following a takeoff or landing accident.

9.0 Passenger Manifests

According to the manager of airport operations at LGA, the airplane's flight and cabin crew did not provide a timely and accurate passenger count to first responders. The crew initially provided a passenger count of 125 and F/A 1 provided the Port Authority police with the top portion of the departure report listing the passenger count as 125. When asked directly by the manager of airport operations a F/A confirmed that 125 passengers was the correct count. It was not until later in the day the LGA airport operations staff learned that the actual passenger count was 127.

DAL provided a document entitled "emergency passenger manifest" via FAX to the NTSB at 13:25, about 2 hours 23 minutes after the accident. This document listed 127 passenger names and 5 crewmember names. The emergency passenger manifest supplied by DAL noted that there were two lap children on board the flight. However, the portion of the departure report provided by F/A 1 to the emergency responders did not include lap children as part of the "total on board" passenger count.

Title 14 *CFR* 121.693 required that all certificate holders prepare a load manifest that included, at the time of takeoff, the names of passengers (unless the passenger names are maintained by some other means). According to FAA InFO 08040, "Emphasis on Load Manifest" (July 10, 2008), FAA Action Notice 8430.29 (December 30, 1988) provided guidance on a legal interpretation of 14 *CFR* 121.693(e) regarding the manifest accounting of all non- crewmembers and the recording of passenger names (attachment 9). The guidance from the action notice was codified as Air Carrier Operations Bulletin (ACOB) No. 8-91-2, "Accident Notification and Manifest Accounting Procedures," which stated, in part, the following: "The principal reason for this regulation [14 *CFR* section 121.693(e)] is to facilitate the rapid and accurate determination of how many passengers are on board an aircraft, and who they are, in the event of an emergency situation such as an accident or hijacking." Further, the ACOB stated, "The word 'passenger,' as used throughout the Federal Aviation Regulations, means any passenger, regardless of age. "

9.1 DAL Departure Reports

DAL preflight procedures (attachment 14) required that a "departure report" be generated by the DAL customer service agent no more than 15 minutes before the scheduled flight departure to ensure that the passenger information was "as close to final as possible."

This report contained, but was not limited to, special customer service requests, a list of names of expected passengers, and a list of nonrevenue (stand-by) passengers.

The printed departure report reflected a passenger count that was derived and generated from the scanned passenger boarding passes of those passengers on board the aircraft. However, it also listed checked-in passengers who might not have boarded the airplane. The passenger count did not include infants; however, infants were noted as INFT (infant in arms) in the body of the report with the adult's name and seat location.

9.2 DAL Weight Data Record

Once the DAL customer service agent had finished scanning the boarding passes of passengers on the flight, the agent entered the passenger count information into the reservation system. The information is used to generate the weight data record (WDR). The WDR includes cargo bin weight, passenger count, and fuel for weight and balance calculations. Since infants in arms were not issued a boarding pass, they would not be included in the passenger count and not calculated into the WDR. If there was an adjustment that needed to be made due to a late arrival of a passenger, the new count was entered as an update to the WDR. Jumpseat passengers are issued a boarding pass and reflected on the WDR. After departure, an electronic passenger list is generated in the reservation system as part of the flight close out procedures but not given to the flight attendant because this completed after departure, once the boarding door is closed.

9.3 DAL Emergency Passenger Manifests

DAL reported that official emergency passenger manifests were generated for "accidents, irregular operations, and for focus on customer care issues or media events" (attachment 10). These manifests were generated and verified through the Customer Emergency Response Tracking System.

Once a request was made to verify a list, passenger information was automatically extracted from the DAL Reservations Operations Center. Various data points were used to verify information on the list including data entries, seat usage, departure reports, and passenger boarding tickets. The Reservation Operations Center would also collaborate with the station that the flight departed from to ensure all actions were taken to close out the flight properly. Once the list was verified, it became the official manifest. According to DAL personnel, the process to verify a manifest would take about 60 minutes from time of the request.

The DAL Local Emergency Response Action Plan (LERAP) specified that the local Command Center Lead would verify and obtain from the DAL Command Center the aircraft type, number of people onboard (to include passenger, infants, crew), remaining fuel, and any dangerous goods or other special cargo and provide that information to the Airport Emergency Operations Liaison and the Incident Command Post Liaison.

9.4 FAA Oversight

The DAL Certificate Management Office (CMO) conducted oversight inspections of DAL operational control using data obtained through the safety assurance system. Nine different inspectors in the CMO conducted 32 inspections since the fourth quarter of fiscal year 2014. All inspections were satisfactory. These inspections included oversight of the load manifest which included elements of maintaining an accurate passenger list[13].

10.0 Previous NTSB Safety Recommendations

On July 6, 1996, a DAL MD-88 experienced an uncontained engine failure in Pensacola, Florida, in which engine parts penetrated the aft cabin. The aft F/A attempted to call the flight crewmembers to inform them they were beginning an evacuation, but the interphone system was not functioning. As a result, the flight attendant began to evacuate passengers in the back of the airplane while the flight crew, unaware of the situation in the back of the airplane, instructed passengers to remain seated.

In its report on that accident, the NTSB issued Safety Recommendation A-96-148, asking the FAA to "amend Advisory Circular [AC] 120-51B (Crew Resource Management Training) to include guidance regarding the communication of time management information among flight and cabin crewmembers during an emergency." In response, the FAA issued of AC 120-51C on October 30, 1998, specifically focusing crew resource management training on situation awareness, communication skills, teamwork, task allocation, and decision-making. As a result, the NTSB classified Safety Recommendation A-96-148 "Closed--Acceptable Action." The latest revision to this AC, 120-51E, was issued on January 22, 2004.

Several other accidents investigated by the Safety Board involved emergency evacuations. These prompted the Safety Board to conduct a study on the evacuation of commercial airplanes[14]. As a result of the safety study, the Safety Board made safety recommendations to the Federal Aviation Administration. One recommendation, A-00-80, required flight operations manuals and safety manuals to include an abnormal and emergency procedures checklists that directs flight crews to initiate or consider emergency evacuation in all emergencies that could reasonably require an airplane evacuation (for example, cabin fire or engine fire). The FAA issued Notice 8400.56, "Passenger Evacuation Checklist Procedures." Notice 8400.56 that directed principal operations inspectors (POIs) to provide information to their respective operators. This information included a review of abnormal and emergency checklists for procedures that would direct flight crews to initiate, or consider, an emergency evacuation in all emergencies that could reasonably require an aircraft evacuation. Consequently, Safety Recommendation A-00-80 was classified as "Closed--Acceptable Action."

On September 20, 1989, a US Air B-737-400 was an "extra section" passenger flight to replace the regularly scheduled (but cancelled) flight from New York City's LaGuardia

[13] SAS Data Collection Tool (DCT), 3.0 Operational Control: 3.3 Flight Planning and Monitoring- Question #6 Did your observations of Flight / Load Manifest / Weight & Balance Control procedures indicate the certificate holder produced outputs that met regulatory requirements, guidance, and safety performance objectives?

[14] National Transportation Safety Board, Emergency Evacuation of Commercial Airplanes, Safety Study NTSB/SS-00/01 (Washington, DC: NTSB, 2000).

Airport. As the first officer began the takeoff on runway 31, he felt the airplane drift left. The captain then took over and rejected the takeoff, but did not stop the airplane before running off the end of the runway into Bowery Bay. The accident occurred in darkness. Both pilots and the four cabin crewmembers had minor injuries. Two of the 57 passengers were killed and 15 had minor or serious injuries.

The NTSB investigation resulted in recommendations to the FAA that included recommendation A-90-105: Require airlines to provide airport crash/fire rescue personnel accurate and timely numbers of all persons aboard an accident/incident aircraft, and to provide assistance in determining the disposition of persons who have been recovered from the scene of an accident.

The problems associated with the recovery efforts involving an air carrier accident, in which a night takeoff was aborted and the airplane ended up running off the end of the runway and into a body of water, were compounded because rescue personnel did not know exactly how many persons were onboard the airplane. This situation was detrimental to the rescue effort because it created an uncertainty as to how many persons the rescuers had to account for during the rescue operation.

On May 11, 1996, an in-flight fire and impact with terrain of ValuJet Airlines flight 592, a DC-9-32, N904VJ, in the Everglades near Miami, Florida, lacked procedures for boarding and accounting for lap children.

The Safety Board had identified inaccuracies with passenger manifests to include lap children in previous accident investigations and had issued Safety Recommendations A-79-65 and A-90-105 to the FAA to require standardized reporting by air carriers of passengers on manifests.[15]The Safety Board issued Safety Recommendation A-95-56 to the air carrier to review its procedures regarding passenger manifests to ensure their accuracy and accountability of all occupants on the airplane.

11.0 Passenger Photographs and Video

An examination of passenger cellphone photographs and videos (attachment 12 and 13) was conducted to obtain additional information about the sequence of events, passenger and F/A actions, and timing associated with the emergency evacuation process. Time stamps were available for the photograph images, but not for the videos. However, the video durations were available because the videos were taken consecutively with the photograph images; an approximate timeline associated with the evacuation was developed. The photographs and video excerpts were taken by a passenger seated in an aft window seat behind the left wing.

[15] Safety Recommendations A-79-65 and A-90-105 were classified "Closed—Acceptable Action" on April 6, 1981, and April 1, 1992, respectively. ACOB-8-91-2 was developed in response to the Safety Board's Safety Recommendation A-90-105

IMAGE	TIME STAMP	VIDEO LENGTH	DESCRIPTION
IMG 0738 Photo	11:02:13	N/A	The photograph was looking out of the left side window at the left wing over Flushing Bay.
IMG 0739 Photo	11:02:16	N/A	The photograph was looking out of the left side window at the 500 foot runway marker.
IMG 0742 Photo	11:05:30	N/A	The photograph was looking out of the left side window at the left wing inside a mangled fence.
IMG 0743 Video	N/A	0:54	The video showed a passenger seated adjacent to F/A 2 jumpseat. F/A 2 and F/A 3 are walking forward down the aisle toward the front of the cabin. There was a glimpse of the outside conditions and the mangled wing inside the fence. Passengers are standing in the aisle retrieving and donning coats.

IMG 0744 Video	N/A	1:47	The video showed F/A 2 and F/A 3 mid cabin moving towards the aft of the cabin while F/A 1 was heard on the megaphone. F/A 2 told passengers toward the back of the cabin, "We're going to have to evacuate." F/A 1, using the megaphone, said, "We are going to start the evacuation process. The only exits you are required to use right now are the window exits. We will have to do this very calmly, slowly, and single file out of the exit. Please do not take any luggage with you. If you have coats, hats, scarves, gloves, that's great; it's cold outside. Please remain seated. No luggage. Please, no luggage." A passenger seated in one of the last rows of the aircraft asks, "When do we anticipate getting our luggage?" F/A 2 said to him, "We just need to get off the aircraft." Some passengers are standing in the aisle donning coats while some are seated and on cellphones. F/A 3 is moving toward the aft of the aircraft closing overhead bins and said "Calm down. We aren't ready." F/A 1, with the megaphone, said "If we crowd in the aisle we can't help, we can't do anything. We are waiting for instruction. We have fire crew outside the aircraft that will help you off the plane." F/A 3 asked, "Are we doing this now, Carol?" and F/A 1 replied, "I don't know." F/A 2 then stated, "Then we need everyone to stay seated unless you are getting your coats." F/A 3 is still closing opened overhead bins saying, "Stay seated until we direct you otherwise." F/A 3 continued to close overhead bins and states, "everyone stay seated, no bags, no bags, no luggage". A passenger in the aft of the cabin shouts back toward F/A 3, "I'm getting my coat". F/A 3 replied, "I'm sorry, I just don't want everyone to take their luggage". The passenger tells F/A 3, "you need to settle down". F/A 3 moves toward the aft cabin saying, "you all need to move, I need to get back here to my exit."

IMG 0746 Photo	11:15:25	N/A	The photograph was looking out of the left side window at the tailcone slide.
IMG 0747 Video	N/A	1:37	The video clip showed passengers in the aisle with coats and gloves. Some of the passengers have handbags. A female passenger asked, "Are we going that way or this way?" A male passenger responded, "This way is fine, come this way also." Passengers moved down the cat walk through the tailcone. F/A 3commanded "Sit on your butt, stay low, stay calm, sit on your butt, sit on your butt, sit on your butt." Passengers continued to move through the tailcone. F/A 3 said, "Thank you sir for helping, slowly, you have to slide off". F/A 3 is positioned at the tailcone opening. Two firefighters outside the tailcone helped passengers out of the tailcone. The passengers exited the tailcone with the assistance of a firefighter. Passengers are exiting using the wing. Snow is on the ground. Passengers are on cellphones. A first responder said "this way please, sir, over here, you need to go over there. Excuse me guys over there." Fire trucks, police cars, and first responders are neat the aircraft. Passengers have handbags and backpacks. One passenger has a rollerboard.
IMG 0748 Photo	11:19:06	N/A	Passengers are on tarmac in the snow. A fire truck was positioned aft of aircraft. Two fire fighters are on the right side wing helping passengers out of aircraft.

In summary, according to the examination of the photographs and videos about 6 minutes after the aircraft came to a stop was the first indication on the videos the passengers were told they were going to evacuate the aircraft; and about 9 minutes later before videos show passengers exited the aircraft. It was over 17 minutes after the aircraft came to a stop that the passengers were evacuated.

12.0 Medical and Pathological

12.1 Injury Table

Type of injury	Flight Crew	Flight Attendants	Passengers	Total
Fatal	0	0	0	0
Serious	0	0	0	0
Minor[16]	0	0	29	29
None	2	3	98	103

Emily S. Gibson
Survival Factors Investigator

Attachments
1. F/A Statements
2. F/A Training Records
3. F/A Schedules
4. F/A Interview Summary
5. Passenger Statement
6. DAL Inflight Service Onboard Manual Excerpts
7. DAL Inflight Training
8. FAA Cabin Safety Inspector Interview Summary
9. FAA Safety Alert for Operators - InFO 08040
10. DAL Personnel Interview Summary
11. DAL Inflight Training and Procedures Interview Summary
12. Passenger Photos
13. Passenger Videos
14. DAL Airport Customer Service Reference Material

[16] The LGA Airport Operations Manager reported the number of minor injuries; see the Airport Group Chairman's Factual Report for more information.