NATIONAL TRANSPORTATION SAFETY BOARD
Office of Aviation Safety
Washington, D. C. 20594

AIRPORT AND EMERGENCY RESPONSE GROUP CHAIRMAN'S FACTUAL REPORT OF INVESTIGATION

July 11, 2000

A. ACCIDENT: DCA-00-MA-030

LOCATION: Burbank-Glendale-Pasadena Airport, Burbank, California

DATE: March 5, 2000

TIME : 1811 Pacific Standard Time

AIRCRAFT: Southwest Airlines Inc. Boeing 737-300, N668SW

B. AIRPORT/EMERGENCY RESPONSE GROUP:

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C. SUMMARY

On Sunday, March 5, 2000, at 1811[1], a Southwest Airlines Boeing 737-300, N668SW, operating as flight 1455 from Las Vegas, Nevada, overran the departure end of runway 8 following a landing at Burbank-Glendale-Pasadena Airport (BUR), Burbank, California. The airplane traveled through a blast fence at the end of the runway and came to rest on a highway outside the airport perimeter. There were no fatalities to the 137 passengers and 5 crew aboard. The flight was on an IFR flight plan and was cleared for a visual approach to land. Visual Flight Rules (VFR) weather conditions prevailed at the time.

D. DETAILS OF THE INVESTIGATION

1. Airport Information

BUR, elevation 775 feet msl, is located approximately 3 miles northwest of Burbank, California. BUR is owned by the Burbank-Glendale-Pasadena Airport Authority and is operated under contract by a private company, Airport Group International. BUR is certified by the Federal Aviation Administration (FAA) at Aircraft Rescue and Fire Fighting (ARFF) index C[2] in accordance with the applicable provisions of Title 14 CFR Part 139. The last full scale disaster drill was held in March 30, 1999. The last FAA annual airport certification inspection took place December 8-10, 1999

BUR is served by two asphalt[3] transverse grooved runways, 8/26, and 15/33. Runway 15/33 is 6886 feet long and 150 feet wide. Runway 8 is 6032 feet long and 150 feet wide, and it is configured for precision instrument landings, and is equipped with high intensity runway edge

1 All times herein are pacific standard time (PST) based on the 24 hour clock unless otherwise noted.

2 ARFF Index C - 14 CFR Part 139.315/317 -minimum required for aircraft at least 126 feet, but less than 159 feet in length two or three vehicles with a total of at least 3000 gallons of water and Aqueous Film Forming Foam.

3 The first 500 feet of runway 8 was constructed of concrete.

lights, and distance to go markers. A 4-box Precision Approach Path Indicator (PAPI) is located 1,520 feet from the approach end of runway 8 on the left side of the runway. The visual glide path angle is 3.00 degrees. Runway 8 is also equipped with a medium intensity approach lighting system with runway alignment indicator lights (MALSR).

The runway 8/26 runway safety area (RSA) is 500 feet wide, 250 feet each side of the centerline, except for the southern edge of runway 8 east of the runway 15/33 intersection, which is 125 feet, and marked with a movement/non-movement area delineator line. The extended RSA at the west end of runway 8/26 is 200 feet. No RSA exists on the east end of runway 8/26. Metal blast fences are located 270 feet east of the runway 26 threshold and 255 feet west of the runway 8 threshold (See attachment #2).

On March 16, 2000, the Burbank-Glendale-Pasadena Airport Authority Executive Director sent a letter to the Airport/Emergency Response Group Chairman to clarify the status of RSAs at BUR (see Attachment 3). In his letter, he stated that: "The Authority determined that the greatest safety concern and risk to life and property was the close proximity of the passenger terminal and the close proximity of parked and taxiing aircraft adjacent to both runways. The Authority made the decision to pursue replacement of the passenger terminal as its highest priority." He also stated: "Concurrently with the process of replacing the terminal, the Authority has pursued the acquisition of clear zone properties and has considered the possibility of lowering Hollywood Way for the purpose of creating a overrun area. The Authority did successfully acquire some existing parking lots in the RPZ (runway protection zone)." However, he added: "First, the City of Burbank has historically not favored airport acquisition of airport-adjacent properties that have the result of removing businesses from the tax base." Additional details may be found in the Executive Director's letter, attachment #2.

2. Coefficient of Friction Measurements and Runway Assessments

The following coefficient of friction measurements and runway assessments were conducted by the group member from the Federal Aviation Administration (FAA) Technical Center. He was accompanied and assisted by the Airport and Emergency Response Group members. FAA Advisory Circular (AC) 150/5320-12C Measurement, Construction, and Maintenance of Skid-Resistant Airport Pavement Surfaces (dated March 18, 1997), provided terminology and criteria for the inspections.

2.1. Visual Observations

Runway 08/26 measured 6057 feet-long by 150 feet-wide. The surface is Portland concrete cement concrete (PCC) and hot-mix asphalt (HMA). The PCC section extends for the first 500 feet of runway 08. It is grooved with 1/4" by 1/4" at 2 " on center. The HMA section extends for the remainder of runway 08. It is grooved with 1/4" by 1/4" at 1 1/2 " on center. The runway has a single transverse slope, as opposed to a crowned runway that slopes down and away from the runway centerline. The runway pitched down from the north edge to the south.

Average slopes (down to the south):

Station 0+00 1.35%
Station 10+00 1.43%
Station 30+00 1.50%
Station 50+00 1.38%

These averages are within the gradient limits established by AC 150/5300-13 "Airport Design."

Visual inspection of the entire surface of 08/26 indicated a light to medium rubber deposit contamination from Station 10+00 through 20+30 extending 25 feet each side of the runway centerline. These observations were consistent with the Continuous Friction Measuring equipment (CFME) readings.

2.2. Surface Friction Measurements

The CFME device was supplied by San Francisco International Airport (SFO). The CFME was a Mark III version of the Safegate Friction Tester in a SAAB automobile. Test runs were made at 40 mph and 60 mph 10 feet to the right of the runway 8/26 centerline (referenced from the direction of travel) in the 08 and 26 direction. Initial test runs at 40 and 60 mph indicated 500-foot averages above the maintenance planning levels, as indicated in AC 150/5320-12C. The friction readings in the 26 direction were consistently higher than the corresponding readings in the 08 direction. This difference was most notable in the touchdown and braking area for runway 08 landings.

The second set of 40-mph test runs indicated friction levels below the maintenance planning level for two concurrent 500 foot-long segments (in the 08 direction only). These segments correspond to the touchdown zone for runway 08 landings (stations 9+00 through 19+00). AC 150/5320-12C, paragraph 3-20 b states that "the airport operator should conduct extensive evaluation into the cause(s) and extent of the friction deterioration and take appropriate corrective action". Data strips from the SAAB friction tester are attached as part of this report (see Attachment 5).

Texture depth measurements were measured at the touchdown, midpoint, and rollout areas for runway 08. The touchdown area readings (0.01) reflect the presence of rubber deposits and are consistent with the CFME and visual evidence. AC 150/5320-12 C, Paragraph 3-22 b (3) recommends correction of this condition within 2 months. Texture depth measurements at the midpoint and rollout averaged 0.04. Paragraph 3-22 b (1) recommends texture depth measurements each time a runway friction survey is conducted.

Groove widths, depths and spacing were measured at touchdown, midpoint, and rollout.

Averages:

Station 0+00 1/4" wide by 1/4" deep by 2" oc in PCC
Station 10+00 1/4" wide by 3/16" deep by 1 1/2" oc in HMA
Station 30+00 1/4" wide by 3/16" deep by 1 1/2 " oc in HMA

Station 46+87 1/4" wide by 1/8" deep by 1/1/2" oc in HMA.

There was evidence of groove deterioration between stations 43+19 and 53+08 in the paths of the mains (10' off centerline). Average groove depths/widths are at or below 1/8" for approximately 1000'. AC 150/5320-12C paragraph 3-5 recommends immediate action when this condition exists for 1500 feet or more.

4. Emergency Response

4.1 Notification and Response

On March 7, 2000, the Survival Factors Group interviewed the 6 BUR fire fighters who initially responded to the accident. They reported that, at 1811, the BUR Air Traffic Control Tower (ATCT) notified the BUR ARFF station via the direct crash phone, an "Alert 3...alert 3...alert 3[4] -runway 8/26". The BUR ARFF station personnel responded with all ARFF trucks and fire fighters, which included 6 fire fighters and 3 fire trucks and 1 rescue truck (see Attachment 1). Crash 1, 2, and 3 contained 4500 gallons of water and Aqueous Film Forming Foam (AFFF) (1500 gallons per truck).

Crash 1 reported that the airplane was on Hollywood Way and Crash 2 (Incident Command) radioed the other Crash units to use Gate 300 to access scene, because the blast fence debris precluded the direct route. Crash 2 used Gate 300 as advised, and it was the first truck on the scene followed by Crash 4. Rescue 17 followed Crash 4 and was the third emergency vehicle through gate 300. A fire fighter used the truck public address system to direct evacuating passengers to move behind the emergency vehicles. Another fire fighter placed a ladder against the left wing to gain access to airplane. A handline was deployed to the interior through the left over wing exit. An additional handline was deployed outside of the airplane to control a small fuel spill. One fire fighter noticed that the L2 slide was at a bad angle so he halted the evacuation repositioned the slide, and reinitiated the evacuation.

Crash 1 responded at a high closure speed toward the blast fence and experienced difficulty slowing the vehicle due to a radio microphone which became lodged between the foot feed causing it to jam in the full open position. After, freeing the microphone, he radioed the other emergency vehicles that gate 300 should be utilized because debris was blocking access through the break in the blast fence. He arrived at gate 300 where the other vehicles had arrived and waited for him to open the gate. After multiple attempts to open the gate with his access card, which required about 30 seconds, he opened the gate, and the trucks proceeded. Crash 1 was the last airport emergency vehicle through gate 300.

4 Alert 3 - Defined in the BUR Emergency Plan as: " ..an aircraft accident has occurred on or in the vicinity of the airport."

Fire fighters blanketed the area with foam and maintained adequate supplies of water and foam. They observed some passengers exiting via the L1 and L2 exits. The fire fighters stated that most of the passengers had evacuated (approximately 90 people) by the time they arrived. Fire fighters estimated their response time to be between 1 ½ and 1 ¾ minutes. One fire fighter entered the airplane via the ladder at the left wing, went to the rear, and noticed an "electrical smell." He then instructed the a flight attendant to "keep doing what she was doing and get people off and then get herself off". A hand line was then brought in. A Southwest Airlines pilot accompanied by a fire fighter was boosted up to the cockpit window to check the switch positions, to ensure that they were off.

The incident commander (IC) stated that no smoke or fire was observed. He stated that on the approach to the airplane he observed what he thought was fuel under each wing and quite a few passengers on the left side of the airplane. As part of the incident commander's logistical duties, he ensured a relay operation was established and maintained in order to keep an adequate supply of foam and water available to the active crash trucks on scene. He also made sure that a blanket of foam was maintained under the aircraft to suppress the volatility of the fuel spill. While foaming, the IC observed steam rising from what he stated were the brakes leading him to believe the brakes were hot.

The IC was concerned with electrical power to the aircraft and wanted the aircraft batteries to be disconnected. He observed the batteries being disconnected by two Southwest Airlines mechanics, as the baggage was being removed from the forward cargo compartment. During the airplane recovery process the IC ensured that foam was sporadically applied to the area while de-fueling and salvage operations were taking place.

While assessing the scene one of the fire fighters from Rescue 17 checked a car that was involved in the accident, tuned off the ignition and gave the keys to the police. He asked a flight attendant for a passenger and crew count, and after receiving it he instructed her to help position passengers by the gate. All 137 passengers and 5 crew members were accounted for. Six persons were transported to local hospitals with minor injuries. A total of 300 emergency response personnel, 11 fire trucks, 8 advanced and basic life support vehicles, and miscellaneous support vehicles responded to the accident. (also see Attachment 4)

4. 2. Emergency Preparedness

BUR has an FAA approved Airport Emergency Plan (AEP) is accordance with 14 CFR Part 139.325.

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