National Transportation Safety Board
Aviation Accident Final Report

Location:	KILLEEN, TX	**Accident Number:**	FTW00FA101
Date & Time:	03/21/2000, 1914 CST	**Registration:**	N353SB
Aircraft:	Saab 340B	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 Minor, 35 None
Flight Conducted Under:	Part 121: Air Carrier - Scheduled		

Analysis

The captain was the flying pilot for the night landing on runway 01 in instrument meteorological conditions (IMC), with a right cross wind from 110 degrees at 14 gusting 18 knots, drizzle, and a wet runway. Prior to starting the approach, the flightcrew determined that the landing approach speed (Vref) and the approach speed (Vapp) were 122 and 128 knots, respectively. DFDR data showed the airplane flying on autopilot as it passed the middle marker at 200 feet AGL at 130 knots on the ILS approach. Approximately 3 seconds after the first officer called "runway in sight twelve o'clock," the captain disconnected the autopilot, while at a radio altitude of 132 feet and on a heading of approximately 18 degrees. Within approximately 11 seconds after the autopilot disconnect, the glideslope and localizer deviation increased. The first officer called "runway over there." Approximately 5 seconds before touchdown, the airplane rolled right, then left, then right. DFDR data-based performance calculations showed the airplane crossed the threshold at an altitude of 35 feet and 130 knots. The airplane touched down 2,802 feet from the approach end of the 5,495-foot runway (844-foot displaced threshold) at 125 knots on a heading of 10 degrees. The airplane overran the runway and struck a ditch 175 feet beyond the departure end of the runway. Landing roll calculations showed a ground roll of 2,693 feet after touchdown, consisting of 1,016 feet ground roll before braking was initiated and 1,677 feet ground roll after braking was initiated until the airplane exited the pavement. According to Saab, for a wet runway, the aircraft would have needed 1,989 feet from the time of braking initiation to come to a complete stop. The American Eagle Airlines, Inc., FAA approved aircraft operating manual (AOM), states in part: Stabilized approaches are essential when landing on contaminated runways. Landing under adverse weather conditions, the desired touch-down point is still 1,000 feet from the approach end of the runway. Touchdown at the planned point. Cross the threshold at Vapp, then bleed off speed to land approximately Vref -5. Use reverse, if needed. To achieve maximum braking effect on wet runway, apply maximum and steady brake pressure. In 1992, the City of Killeen submitted a proposal that included extending the north end of runway 01 by 194 feet. The FAA originally disapproved the proposal, in part, because the runway extension decreased the length of the runway safety area (RSA) which was already shorter than the recommended 1,000 feet for a 14 CFR Part 139 certificated airport. The proposal was subsequently approved and a drainage ditch was installed in the north RSA, perpendicular to the runway and

approximately 175 feet north of the departure end of runway 01. In 1993, the airport received FAA Part 139 certification. The 1998 and 1999, FAA airport certification inspection reports noted the inadequate RSA; however, neither letter of correction, sent from the FAA to the City of Killeen following the inspections, mentioned the RSA. Following this accident, the ILS runway 01 was flight checked by the FAA and all components were found to be operating within prescribed tolerances. Examination of the airplane found no anomalies that would have prevented it from operating per design prior to departing the runway and encountering the ditch.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the captain's failure to follow standard operating procedure for landing on a contaminated ruway in that he touched down long, which combined with his delayed braking resulted in a runway overrun. Contributing factors were the captain's failure to maintain runway alignment following his disconnect of the autopilot, the gusty crosswind and the wet runway. In addition, the following were contributing factors: (1) the airport operator's failure to fill in a ditch in the runway safety area, (2) the FAA's granting of 14 CFR Part 139 approval to the airport when the runway safety area (RSA) did not meet the recommended length for a Part 139 airport, and (3) the FAA's continued lack of acknowledgement to the airport of the inadequate RSA following their annual airport inspection checks.

Findings

Occurrence #1: OVERRUN
Phase of Operation: LANDING - ROLL

Findings
1. LIGHT CONDITION - NIGHT
2. WEATHER CONDITION - LOW CEILING
3. (F) WEATHER CONDITION - CROSSWIND
4. (F) WEATHER CONDITION - GUSTS
5. (F) AIRPORT FACILITIES,RUNWAY/LANDING AREA CONDITION - WET
6. (F) PROPER ALIGNMENT - NOT MAINTAINED - PILOT IN COMMAND
7. (C) PROCEDURES/DIRECTIVES - NOT FOLLOWED - PILOT IN COMMAND
8. (C) TOUCHDOWN - DELAYED - PILOT IN COMMAND
9. (C) BRAKES(NORMAL) - DELAYED - PILOT IN COMMAND

Occurrence #2: ON GROUND/WATER ENCOUNTER WITH TERRAIN/WATER
Phase of Operation: LANDING - ROLL

Findings
10. (F) TERRAIN CONDITION - DITCH
11. (F) AIRPORT - NOT CORRECTED - AIRPORT PERSONNEL
12. FACILITY INADEQUATE - FAA(OTHER/ORGANIZATION)
13. (F) INADEQUATE CERTIFICATION/APPROVAL - FAA(ORGANIZATION)
14. (F) INADEQUATE SURVEILLANCE,INADEQUATE PROCEDURE - FAA(ORGANIZATION)

Factual Information

HISTORY OF FLIGHT

On March 21, 2000, approximately 1914 central standard time, a Saab 340B twin turboprop airplane, N353SB, operating as Eagle Flight 3789, sustained substantial damage upon impact with a drainage ditch following a runway overrun during the landing roll on runway 01 at the Killeen Municipal Airport (ILE), Killeen, Texas. (All times in this report are central standard time, based on a 24-hour clock). The airplane was operated by American Eagle Airlines, Inc., and was registered to AMR Leasing Corporation of Fort Worth, Texas. The scheduled domestic passenger/cargo flight was operating under 14 Code of Federal Regulations (CFR) Part 121. The 3 crewmembers and 33 passengers were not injured. One passenger was transported to the hospital for treatment of hypertension. Night instrument meteorological conditions (IMC) prevailed for the flight, and an instrument flight rules (IFR) flight plan had been filed. The flight originated at 1829 from the Dallas/Fort Worth International Airport (DFW), Texas, with a destination of ILE.

According to the cockpit voice recorder (CVR) data and flight crew interviews, the captain was the pilot flying (PF) on the flight from DFW to ILE, and the first officer was the non-flying pilot (PNF). The flight crew reported that the takeoff/initial climb from DFW, the en route phase of flight, and the clearance for the instrument landing system (ILS) approach at the destination non-towered airport were routine.

At 1854:36, the PNF obtained the ILE automated weather observation: wind from 090 degrees at 11 knots, visibility 1 1/2 miles, ceiling sky overcast at 200 feet, temperature 18 degrees Celsius, dew point 17 degrees Celsius, altimeter 29.96 inches Hg. At 1855:34, the PNF made initial contact with the Gray Approach Control controller and reported the flight descending to 8,000 feet. At 1855:39, the flight crew was advised by the controller to expect an ILS runway 01 approach at ILE.

The flight crew performed the descent and approach checklist during which the altimeters were set to 29.96 inches of Hg, and the speeds were briefed as 122 [Vref-red], 128 [V-approach green], and 130 [V-minimum maneuvering or V-clean configuration] knots, respectively.

At 1857:55, the controller cleared the flight to descend to 3,000 feet.

At 1859:22, the PNF identified the Morse code for the IRESH NDB/OUTER MARKER.

At 1859:59, the controller began vectoring the flight for the ILS approach to runway 01 at ILE and assigned an initial heading of 190 degrees.

The PF briefed on the missed approach procedures, and the PNF tuned and identified the Morse code for the localizer for runway 01 at ILE. After a series of turns the flight was cleared at 1908:42 for the ILS runway 01 approach. Subsequently, the glideslope and localizer were intercepted, and the flight crew performed the before landing checklist.

At 1910:22, the controller issued a frequency change, and requested that the flight crew report when the airplane was on the ground.

At 1910:41, the PNF transmitted that Eagle flight 789 was on the ILS runway 01 Killeen, five miles out.

At 1912:33, the PNF called approaching minimums.

At 1912:40, the PNF called intermittent ground contact.

At 1912:46, the PNF called runway in sight twelve o'clock.

At 1912:49, there was a sound similar to autopilot disconnect, and the PF called going visual.

At 1913:01, the PNF called "runway over there".

At 1913:28, there was a sound of loud noise.

At 1913:37, the captain gave the command to evacuate the aircraft. The airplane was evacuated through the main cabin door, and the passengers were transported to the terminal via vans.

The captain notified the controller that the airplane went off the end of the runway. The first officer notified American Eagle Operations/Dispatch that the airplane ran off the end of the runway.

During interviews and in written statements, the captain reported that he "did not have the condition of the runway prior to the touchdown or he would not have landed the airplane at ILE." There were no aircraft discrepancies in flight. During the ILS approach, the airplane was on glideslope and on localizer at Vref 122 or less. Touchdown was in the touchdown zone (TDZ) and before glideslope intersect of the runway. The landing was "firm" on the right main landing gear followed by the left main landing gear and nose landing gear. Upon seconds after touchdown, the airplane was slipping forward and left (diagonal) toward the left side and felt like it was skidding along and accelerating. The captain described it as "like stepping on a banana." He said he did not lose 100% directional control; however, as he attempted to maintain centerline alignment, the airplane veered right, departed the runway onto the grass, and into the ditch. The captain described the runway as contaminated: glassy, slick, lots of water, braking action NIL. The last weather report obtained by the crew was from the ILE Automated Weather Observation System (AWOS), which was recalled as 1 1/2 miles visibility, 200-foot overcast, with the wind from 090 degrees at 11 knots.

During interviews and in a written statement, the first officer (FO) reported that he did not observe any aircraft discrepancies during the preflight inspection at DFW or en route to ILE. The FO stated the touchdown at ILE was 500 feet beyond the displaced threshold, and the aircraft was slipping after touchdown. He recalled a lack of deceleration. He observed the power levers moving aft toward beta; however, he did not recall full reverse before departing the runway. The FO did not recall puddles of water on the runway or constant precipitation at the time of the landing. He described the runway as glassy. The weather was mist in the air and the visibility was good. He recalled the anti-skid working, deceleration, and braking.

One witness, an Army Aviation Safety Officer and pilot, who was waiting for a passenger on the flight, first sighted the airplane on final approach "approximately 600 feet agl. On short final the [air]plane making sharp corrections to first the left, and then to a lesser correction to the right." The airplane was "still making corrections when it touched down on the runway, abeam the witness's position near the terminal, approximately mid field before taxiway Delta. The aircraft was still traveling at a high rate of speed at touchdown and did not appear to slow as it continued down the runway." This witness reported the weather conditions were "overcast with light rain and drizzle." He further stated that the wind was from "090 degrees (windsock abeam my position approximately 500 feet away). The wind sock was fully extended."

A second witness was one of the airport rescue and fire personnel, who also observed the aircraft's approach and landing from his location at midfield. He observed the airplane landing

on the runway "about the 2,000 feet remaining marker." Further, this witness "thought it was going too fast and was not going to make it." The witness stated that the weather had been drizzling "off and on all day [and] the runway and taxiways were very wet."

A third witness, the aircraft line technician, observed the airplane coming in on runway 01 with all landing lights on, and the aircraft "appeared to touchdown midfield" and "traveling faster than normal and the right wing dipped upon touchdown." Toward the end of the runway, "it appeared the tail section was moving up and down as if brakes were being applied at high speed. The aircraft turned right and the tail section raised to about a 45 degree angle and came back down" as the aircraft struck the ditch. The runway lights were on and the rotating beacon was operational. This witness reported the "wind was calm to light, low clouds and solid, not raining but damp and misty."

Passenger Statements (NTSB Form 6120.9) were sent to twenty-two passengers. Nine passengers returned their Passenger Statements to the NTSB investigator-in-charge (IIC). On their statements, the passengers reported the following information: Seat belts were fastened during the entire flight, and the flight attendant expedited the evacuation in an orderly fashion. The passengers had to jump about 2-3 feet from the doorway to the ground. Passengers reported that it was 20-30 minutes to about 1 hour, standing in light drizzle and rain, before they were bused to the terminal.

One passenger, a student pilot with 32 hours who stated he flew into ILE about 15 times per year on the airlines, reported the pilot brought the airplane in "high, hot, and long and quite simple run out of runway. The engine noise coming in didn't cut back much, we were higher than normal crossing the south border of the runway, we did land longer down runway, and the prop[ellers] trim was harder and more abrupt than normal." The pilot "waved the airplane on final several times" prior to touchdown. This passenger described the airplane as banking left just prior to touchdown, leveling before touchdown, and landing "normally." The landing was "quite a ways down the runway though [and] we rolled out quite a ways before the props [propellers] were trimmed and when this occurred it was substantially harder jolt than normal."

A second passenger, who was also a pilot and had landed as a pilot at the airport many times, reported dark night conditions with a strong crosswind. Further, he stated the airplane was "coming in too fast and were too high, touchdown seemed to be farther down the runway than normal. Prop[ellers] reversal was not engaged for several seconds after touchdown. Full reverse thrust and full braking then occurred."

Additionally, two passengers recalled "halfway past the runway as the airplane was landing."

Other passengers reported the airplane was high and fast on the approach. The airplane did not touchdown on the first part of the runway. The touchdown was very bumpy. After touchdown, tires were grabbing, the engines were roaring loudly, and the airplane started shaking and the vibration got worse until the airplane stopped.

Passengers described the conditions as dark night, sky overcast with low ceilings, fog, freezing drizzle, light drizzle, light rain, and rain. Some passengers reported there was good visibility below the cloud layer.

PERSONNEL INFORMATION

Neither the captain nor the first officer had any Federal Aviation Administration (FAA) record

of airplane accidents, incidents, or enforcement actions. The accident flight occurred on the 2nd day of a 4-day trip sequence. On the day of the accident, the accrued crew duty time was 5 hours 35 minutes with an accumulated flight time of 2 hours and 29 minutes. Reviews of the flight and duty time records and crew interviews disclosed no evidence of any activities that would have prevented either flight crewmember from obtaining sufficient rest in the 72 hours before the accident.

The Captain

The captain held an airline transport pilot certificate with the ratings and limitations of airplane multiengine and single-engine land; and type ratings for the Saab 340 and L-382. The captain obtained his Saab 340 type rating on June 6, 1995. His most recent FAA first-class medical certificate was issued on November 18, 1999, with the limitation that he possess glasses for near and intermediate vision while acting as a pilot.

During a review of company records, the completed Pilot/Operator Aircraft Accident Report (NTSB Form 6120.1/2), interviews with company personnel, and an interview with the captain, the following information was revealed. The captain, hired in March 1989 by Simmons Airlines as a first officer, was upgraded to captain in August 1995 when American Eagle, Executive, Simmons, Wings West, and Flagship merged with AMR. The captain was designated as a company line check airman, and he was current and qualified (ground, emergency, flight, line) as captain for the CFR Part 121 flight. The captain's most recent recurrent ground and flight training was accomplished in June 1999 at the facilities of American Airlines, Inc., of Dallas, Texas. On June 14, 1999, the captain satisfactorily completed his most recent line check during a 1.08-hour flight from TXK to DFW. He had accumulated 12,518 total flying hours of which 9,251 (3,574 captain; 5,677 FO) were in the Saab 340. He had flown 74, 154, and 787 hours in the past 30 days, 90 days, and 1 year, respectively. The captain had accumulated 2,155 total night flying hours, and 1,186 actual instrument flight hours of which he estimated 750 hours were in the Saab 340. He had accumulated an estimated 106 flights into ILE during which he had performed the ILS runway 01 approach on several flights in IMC. The captain was previously dispatched on the DFW to ILE route on March 6 and March 7 in the Saab 340 airplane, where he landed the airplane at 2316 and 1831, respectively.

The First Officer

The first officer held a commercial pilot certificate with the ratings and limitations of airplane multiengine land, single-engine land, and instrument. He also held a flight instructor certificate with the ratings and limitations of airplane single-engine land and instrument. His most recent FAA first-class medical certificate was issued on June 23, 1999, with the limitation that he must wear corrective lenses for distant vision.

During a review of company records, the completed Pilot/Operator Aircraft Accident Report (NTSB Form 6120.1/2) and an interview with the first officer, it was revealed that the first officer was hired by American Eagle in June 1998 as a flight crewmember on the Saab 340 airplane. The first officer was current and qualified to act as second-in-command of the Saab 340B airplane for the CFR Part 121 flight. He had accumulated 2,105 total flying hours of which 1,040 hours were in the Saab 340. He had flown 70, 215, and 840 hours in the past 30 days, 90 days, and 1 year, respectively. The first officer had accumulated 436 total night flying hours, and 193 actual instrument flight hours. The first officer estimated that he had been a

crewmember on 15 flights into ILE; however, this was the first flight in night IMC on the approach to minimums.

AIRCRAFT INFORMATION

N353SB, a Saab 340B, serial number (S/N) 353, was issued an airworthiness certificate on December 3, 1993. The airplane was configured to carry 35 passengers, two pilots, and one flight attendant. The airplane was equipped with two General Electric, model CT7-9B, engines rated at 1,750 shaft horsepower for maximum continuous and normal takeoff. The airplane was equipped with two Hamilton Standard, Model 14 RF-19, four bladed composite propellers.

According to a Saab Aircraft engineer, the "power lever angles are 90 degrees maximum, 42 degrees flight idle, 19 degrees ground idle, and 0 degrees maximum reverse." Further, the engineer stated the "power lever angle at ground idle can not be adjusted and is not affected by A/C rigging. Position for the ground idle is 18-22 degrees measured from the surface of the control quadrant, or as an alternate measurement: 18.5 +-1 degrees aft rig point in the control quadrant."

DFDR data for the previous flight indicated a left power lever angle of 14.1 degrees; right 15.2 degrees, respectively, when the aircraft was parked at the gate.

Weight and Balance

Eagle flight 3789 departed DFW with 2,794 pounds of fuel. The subsequent de-fueling at the accident site was calculated at 2,200 pounds.

Landing field length with flaps 20 degrees, temperature 18 degrees Celsius, winds 100/9, wet asphalt and landing weight of 28,170 pounds calculated as 4,200 feet with good braking. Medium to good braking (4,560 feet) add 360 feet, medium braking (4,974 feet) add 774 feet. If reverse is not available, add 4,017 feet to landing field chart length.

Utilizing the SAAB 340B center of gravity calculator, the airplane's landing weight of 28,170 pounds and its center of gravity (CG) were within landing limits. According to the American Eagle Airlines, Inc., FAA approved operating manual, the landing approach speed (Vref) for the calculated landing weight was 120 knots. V approach (minimum Vref +5; maximum Vref +20) = Vref + 1/2 wind + gust (maximum wind factor increment 20 knots; if wind direction is more than 45 degrees off runway centerline the wind increment may be reduced 5 knots).

Maintenance Records Review

The maintenance check intervals are the Periodic Service Checks (PS-1, 3 calendar days, and PS-2, 7 calendar days), Phase Checks (400 flight hours), Main Base Visit (MBV/"C" check @ 4,800 flight hours), and HMBV/"C+" check @ 9,600 flight hours). The HMBV checks are performed at the main maintenance base at Abilene, Texas; however, all other inspections may be performed at Abilene or the hub stations: DFW, ALB, MIA, SBP, or LAW. The company operates 110 SAAB 340B aircraft of which 25 are 340B Plus aircraft.

The last Heavy Main Base Visit (HMBV) for a major inspection of airplane N353SB, which had been operated by AMR Leasing Corporation since December 1993, was performed in January 1999. At that time, the airplane had accumulated 11,975.9 flight hours and 12,189.0 cycles. At the time of the runway overrun, the airplane had accumulated 14,054.0 flight hours, 14,658 cycles, and 2,078.1 hours since the last HMBC check.

The nose landing gear tires were changed on February 22, 2000, at an accumulated aircraft

flight time of 13,889.5 hours. The main landing gear tires had been changed as follows:

Tire	Date	Aircraft Total Time	Flight hours	Estimated cycles*
#1	March 7, 2000	13972.1	81.9 hours	82 cycles
#2	February 28, 2000	13921.8	132.2 hours	130 cycles
#3	February 20, 2000	13881.8	172.2 hours	177 cycles
#4	March 18, 2000	14025.1	28.9 hours	18 cycles

*Tire cycles based on company personnel estimate of 5.89 cycles per day.

Three of the four wheel speed transducers (left outboard S/N 1754, left inboard S/N 1779, right inboard S/N 1842) had 14,054.0 flight hours (14,658 cycles) since new and had not been changed during the life of the aircraft. The right outboard transducer, S/N 1908, was changed on November 13, 1997, at a total aircraft time of 9,508.6 flight hours (10,331 cycles). There was no maintenance history found for the antiskid control valves (P/N 39-647, S/N's 851 & 852) or the control box (P/N 42-683-3, S/N 442).

The left main landing gear strut was repacked on August 5, 1999, at an accumulated total aircraft time of 12,687.7 hours. The right main landing gear strut was repacked on July 31, 1999, at 12,663.2 hours. There was no maintenance history found for the nose landing gear strut.

Aircraft Maintenance Log (AML) entries for December 8, 26, and 31, 1999, indicated the nose wheel steering was binding and difficult to steer when making left turns from the center position. On the 8th, the nose wheel steering was lubricated and adjusted. On the 26th and the 31st, an operational check was performed and no defects were noted at that time. On January 29, 2000, the shimmy damper was serviced. On February 11, 2000, the tiller was reported as hard to turn left. The steering cable was cleaned and lubed, and the steering checked within specifications.

On July 30, 1999, at an accumulated total aircraft time of 12,679.0 hours, the main landing gear #3 brake assembly was replaced with a serviceable assembly. On October 23, 1999, at an accumulated aircraft time of 13,166.5 hours, the main landing gear #1 and #2 worn brake assemblies were replaced. On December 14, 1999, at an accumulated total aircraft flight time of 13,479.9 hours, the main landing gear #4 brake pin was found flush and the brake assembly was removed and re-installed.

Both engine power levers were rigged on April 8, 1999, at an accumulated total aircraft flight time of 11,975.6 hours. The left propeller power lever cable, HMU to PCU, was replaced on June 27, 1999. On September 13, 1999, following a pilot report that the power lever for the left engine would not go into reverse, maintenance personnel reset the idle stop, performed an engine run-up without discrepancies, and returned the aircraft to service at an accumulated total aircraft flight time of 12,924.3 hours. The right engine power lever cable was replaced on November 8, 1999, and the power control rigged on November 10, 1999, at accumulated total aircraft time of 13,268.9 hours.

The hydraulic emergency accumulator was serviced on April 15, 1999, at an accumulated total time of 12,006.11 flight hours. The capacity of the main hydraulic reservoir is 310 cubic inches

(approximately 5 liters) with a 1,650 psi nitrogen pressure pre-charge, and an accumulator pressure specification for 2,100 to 2,900 psi.

On June 27, 1999, at an accumulated aircraft time of 12,453.3 hours and 12,724 cycles, the left engine, P/N 6058T8G01, S/N GE-E785548 was installed on the aircraft. At the time of this installation, the left engine had accumulated 11,718.4 hours and 12,175 cycles since new. On October 7, 1999, at an accumulated aircraft time of 13,078.6 hours and 13,653 cycles, the right engine, P/N 6058T83G01, S/N GE-E785485, was installed on the aircraft. At the time of this installation, the right engine had accumulated 14,533.5 hours and 15,106 cycles since new.

Maintenance records, reviewed by the NTSB IIC, did not reveal evidence of any open discrepancies at the time of the runway overrun.

Minimum Equipment List

Review of the operation specifications for American Eagle Airlines, Inc., indicated that the company was authorized to use an FAA-approved Minimum Equipment List (MEL). Neither a visual examination of the aircraft nor a review of the aircraft maintenance log revealed any evidence of inoperative items at the time of the runway overrun.

METEOROLOGICAL INFORMATION

The National Weather Service (NWS) issued the 1800 CST Surface Analysis Chart at 1938 CST on March 21, 2000. The chart depicted a stationary front located to the north of Killeen, Texas, running from New Mexico, into northwest Texas, the Oklahoma panhandle, to northeast Kansas. Another weak stationary frontal boundary was located across Texas running in a southeast-to-northwest direction over Killeen, Texas. An outflow boundary was also depicted over northeast Texas running eastward into central Louisiana, to the east-northeast of Killeen, Texas.

The Surface Analysis at 1800 CST on March 21, 2000, depicted a general east to southeast wind flow with overcast skies, with several stations along the frontal border reporting visibility restrictions in fog or mist, and north of the frontal boundary continuous light rain.

The Automated Weather Observation System (AWOS-3) official weather reports transmitted for Killeen, Texas (ILE) surrounding the time of the accident in part are:

At 1915 CST, wind from 110 degrees at 14 knots gusting to 18 knots, visibility 1 3/4 statute mile in light drizzle, ceiling overcast at 200 feet, temperature 18 degrees Celsius (C), dew point temperature 17 degrees C, altimeter 29.96 inches of Hg.

At 1855 CST, wind from 100 degrees at 12 knots, visibility 1 1/2 miles in light drizzle, ceiling overcast at 200 feet, temperature 18 degrees C, dew point 17 degrees C, altimeter 29.96 inches of Hg.

From the time of the accident back to 1335 CST on March 21, 2000, the weather conditions at Killeen were characterized as low instrument flight rules (LIFR) with ceilings at 200 feet or less, and visibilities ranging from 3/4 to 1 3/4 statute mile in drizzle or rain showers. The rain that occurred between 1355 CST and 1635 CST, measured 0.05 inches. The total precipitation that fell during the 2 1/2 hour period would have been classified as light to moderate in intensity. The reports indicate that "runway and taxiway surfaces were wet as a result of the precipitation, but do not support a flooded or standing water condition."

The upper air soundings from Fort Worth, Texas (located 107 miles north of Killeen), at 1800

CST, on March 21, 2000, indicated surface winds from the east at 11 knots veering to the southwest with height.

Satellite data, recorded immediately following the accident, depicted a dark gray tone indicative of low stratus type cloud over Killeen, Texas. The NWS issued AIRMET Sierra and AIRMET Tango, in part for: (1) occasional ceilings and visibility below overcast 1,000 feet and 3 miles visibility in clouds, scattered precipitation, and mist; (2) occasional moderate turbulence below 8,000 feet.

The flight crew's pre-departure weather document was prepared by and issued by American Airlines Weather Services meteorologists. The weather document included the departure weather forecast, destination weather forecast, alternate weather forecast, in-flight weather advisories, pilot reports, weather depiction map, current weather conditions at DFW, ILE, ACT, CLL, and AUS. The weather document indicated there were no D-NOTAMs published for ILE. Further, the document included the field condition report issued at 1620 on March 21, 2001, by the American Eagle Station personnel, who were not certified by the National Weather Service as observers. The report included the following data: runway 01/19 open with the runway conditions as wet with 0.01 inches of water, with braking action good.

The American Airlines forecast for ILE expected the following conditions: From 1300 CST wind from 120 degrees at 10 knots gusting to 20 knots, visibility better than 6 miles, ceiling overcast at 1,000 feet, probability 30 percent of visibility 4 miles in light rain showers and mist, ceiling broken at 500 feet and overcast at 1,000 feet. From 1800 CST, wind from 130 degrees at 12 knots, visibility better than 6 miles, ceiling overcast at 1,200 feet. Temporary conditions between 2000 CST to 2200 CST of visibility 5 miles in mist, ceiling overcast at 600 feet.

AERODROME INFORMATION

ILE, located approximately 3 miles east of Killeen, is owned and operated by the City of Killeen, Texas. According to American Eagle personnel, their flight crews operate the Saab 340 aircraft at 12 different airports, including Killeen, where the longest runway is less than 6,000 feet.

ILE is a non-towered airport with one runway, runway 01/19. Runway 01/19 is an asphalt/aggregate friction seal coat surfaced runway, 5,495 feet long, and 100 feet wide. Runway 01 elevation is 848 feet and runway 19 is 840.1 feet. Runway 01 has an 844-foot displaced threshold with a runway crossing height of 46 feet agl and a touchdown zone elevation of 843.8 feet msl. Runway 01's 5,495-foot-length minus 844 feet for the displaced threshold results in 4,651 feet of runway available for landing. Runway 01 is equipped with a 3-degree visual glide path angle 4-box VASI and a 1,400-foot medium intensity approach lighting system with runway alignment indicator lights (MALSR). The approach lights are pilot activated on the common traffic advisory frequency (CTAF) 122.7 Megahertz. A timer operated the runway lights and the taxiway lights; however, the intensity of the runway lights may be changed when the pilot keys the airplane microphone over the CTAF.

Runway 01 is served by an ILS with an outer compass locator, identified as IRESH, co-located with the outer marker, 3.5 nm from the runway threshold, and a middle marker, 0.4 nm from the runway threshold. The glideslope intercept altitude is 2,100 feet msl (1,256 feet agl) at 3.5 nautical miles from the runway threshold. The middle marker intercept altitude is 1,030 feet msl (186 feet agl) at 0.4 nautical miles from the runway threshold. Minimum approach visibility is 3/4 mile with a final approach course of 010 degrees and a decision altitude of

1,094 feet msl (250 feet agl).

Following the accident, a NOTAM issued by the airport operations manager closed the airport. The airport was re-opened on March 22, 2000; however, per the NTSB IIC's request, the manager issued a NOTAM for the glideslope out of service pending an FAA flight check of the ILS glideslope. On March 23, 2000, the ILS was flight checked by the FAA, all components were found to be operating within prescribed tolerances, and the NOTAM was cancelled.

A review of the airport discrepancy log revealed the following lights were inoperative at the time of the accident: 3rd row MALS east light; RAIL #5 light; 4th row MALS east light; and southwest light of the windsock.

On the morning of March 22, 2000, the NTSB IIC and the FAA inspectors performed a visual inspection of runway 01/19. All inoperative lights had been repaired. Runway 01 had a downhill slope towards the departure end, and a slope [engineering plans, dated 1998, indicated a runway pavement slope of 1.5 percent] from the centerline toward the runway edges. The ground elevation along each edge of the runway sloped downward away from the edge of the runway. Additionally, the runway seal coat was missing in numerous sporadic areas where confined shallow pockets less than 1/4 inch deep were found in the runway surface and narrow pockets approximately 6 inches long were found parallel to the runway centerline. In the vicinity of taxiway Charlie, one runway centerline reflector was found loose and one reflector was missing from the runway. Runway reconstruction profile elevation documents dated January 1986 indicated a runway centerline to edge slope of 1.5 percent.

Airport Improvement Project

In 1992, the City of Killeen submitted a proposal that included extending the north end of runway 01 by 194 feet. The FAA originally disapproved the proposal, in part, because the runway extension would "decrease the safety area by 194 feet. The existing safety area is already shorter than the recommended 1,000 feet" for a Part 139 certificated airport. However, in August 1992, the FAA approved the runway extension. In August 1993, the runway extension project was completed, and the airport was granted FAA Part 139 certification at that time. During the runway extension, a drainage ditch was installed in the north runway safety area (RSA), perpendicular to the runway and approximately 175 feet north of the departure end of runway 01.

FAA Inspection Records

According to the Airport Certification Manual (ACM), there was a 300-foot RSA at the north end of the runway, and a 100-foot RSA at the south end. The August 1998 Airport Certification/Safety Inspection Checklist for ILE contains an entry in the narrative section that reads: "Safety area off the end of R/W 19 now only 200 feet. Airport cut a drainage ditch across the safety area." In August 1999, the annual inspection report mentions that the ACM should be changed because "it appears that the runway safety areas do not extend 200 feet beyond end of the runway." However, neither the letter of correction sent from the FAA to the City of Killeen following the 1998 inspection, nor the letter sent following the 1999 inspection mention the RSA.

According to the ILE operations manager, preparations were being made to fill the drainage ditch early in 2000. A Notice of Proposed Construction or Alteration, dated April 4, 2000, was submitted by the City of Killeen to the FAA, and work was completed on June 2, 2000.

FLIGHT RECORDERS

The cockpit voice recorder (CVR) installed on the aircraft was a Fairchild, model A100A, S/N 54711. The voice recording consisted of four channels with channels 1, 3 and 4 of fair quality (due to excessive noise consistent with 400 Hz A/C electrical power interference) containing the captain's and first officer's audio panel, and the public address system. The audio on channel 2 (cockpit area microphone) was not recorded. A partial transcript was prepared for the 30-minute 52-second recording.

Examination of the cockpit area microphone revealed a broken wire and a split in the insulation surrounding the cabling near the microphone housing. It could not be determined if this damage was a result of removing the microphone from the airplane, or a pre-existing condition. However, according to the recorder manufacturer, a broken wire would likely result in electrical noise being captured on the area microphone channel of the CVR. The cockpit area microphone was tested in the NTSB lab, and it functioned normally during the test.

The digital flight data recorder (DFDR) installed on the aircraft was a Loral Fairchild Digital Flight recorder model F800, S/N 4746, P/N 17M800-261. A readout of the DFDR was performed by the NTSB Office of Research and Engineering and a factual report prepared.

Data from the DFDR shows the autopilot was disengaged at 19:12:49, while at a radio altimeter height of 132 feet. Also at that time, the left and right power lever angles decreased from values of 57.3 degrees and 58.8 degrees, respectively, to values of 50.1 degrees and 51.9 degrees two seconds later.

At 19:12:58, left and right aileron positions were recorded as -13.3 degrees and 11.1 degrees, respectively, before being recorded the following second as -4.1 degree and 2.3 degrees. Also at that time, rudder position was recorded as -9.3 degrees trailing edge left.

At 19:13:02, vertical acceleration was recorded as 1.164 g's. The following second, the glideslope reached a full scale positive deviation, radio altitude decreased to 4 feet, and roll attitude was -7 degrees. Vertical acceleration was then recorded as 0.822 g's at 19:13:04. Also at that time, left and right aileron positions were recorded as -16.8 degrees and 10.1 degrees, respectively.

At 19:13:06, while at a heading of 9.8 degrees, radio altitude decreased to 0 feet, and roll attitude was 8.1 degrees. Also at this time, decreases in power lever angle began, with the right power lever angle reaching 41.7 degrees. The following second the left power lever angle reached 41.3 degrees. Vertical acceleration reached 1.285 g's at 19:13:07, followed by 0.866 g's the next second. Also at that time, longitudinal acceleration was recorded as -0.149 g's.

At 19:13:11, the left weight on wheels status changed to "ground" before returning to "air" during the same second. The following second it returned to "ground", as did the right weight on wheels status. Also at that time, longitudinal acceleration was recorded as -0.509 g's and decreases occurred in left power lever angle to 17.3 degrees and right power lever angle to 14.9 degrees, respectively.

At 19:13:18, the aircraft began a right turn from its heading of approximately 10 degrees. Beginning at 19:13:24, while at an airspeed of 31.0 knots, vertical acceleration values began to fluctuate, increasing over the next several seconds, "most likely due to loss of contact with the runway surface." Three seconds later pitch attitude was recorded as -5.6 aircraft nose down and airspeed was recorded as 21.8 knots.

At 19:13:28, at a heading of 40.1 degrees, the aircraft experienced a longitudinal acceleration of -0.916 g's, a vertical acceleration of 1.450 g's, and a roll of -3.2 degrees.

From 19:13:29, until the end of the incident data, the left weight on wheels status indicated "air."

Flap position remained approximately 19.5 degrees during the landing.

AIRCRAFT PERFORMANCE

An aircraft performance study performed by the NTSB Office of Research and Engineering examined the motion of N353SB and correlated when various events occurred. DFDR and CVR data were used to develop time history of the accident aircraft motion described in the performance report. Calculations of performance parameters derived from the DFDR data for the final several seconds of the landing are presented in the report.

DFDR data showed the aircraft flying on autopilot as it passed the middle marker at 200 feet above ground level (AGL) at 130 knots on approach to Killeen, Texas. DFDR data showed the aircraft approximately -0.1 dots deviation on the localizer, and approximately -0.2 dots deviation on the glide slope. Approximately 3 seconds after crossing the middle marker, the autopilot was disconnected, while the aircraft was flying on a heading of approximately 18 degrees.

Seconds after the autopilot was disconnected, the rudder started to deflect to the left and the heading started to decrease. The airplane rolled to the right. Approximately 8 seconds after the autopilot disconnect, the glideslope deviation increased to -1 dots (fly down), and the localizer deviation had increased to -0.6 dots (fly left) approximately 11 seconds after the autopilot disconnect.

Approximately 5 seconds before touchdown, as the airplane passed the glideslope transmitter, the airplane rolled from 5 degrees right wing down (RWD) to 8 degrees left wing down (LWD), then back to the right to 8 degrees RWD in three seconds, and then near zero at touchdown 1.5 seconds later.

The airplane touched down at 125 knots on a heading of 10 degrees, with the ailerons and rudder deflected. At touchdown the vertical acceleration spiked to 1.3 g's. Immediately after touchdown, the ailerons were returned to neutral position, yet the rudder remained deflected near -4 degrees. The longitudinal acceleration increased from near zero at touchdown to between -0.1 and -0.15 for the next 4.5 seconds after touchdown. The longitudinal acceleration then increased "substantially" to between -0.4 and 0.45 g's for the next 5 seconds. The indicated airspeed was 116 knots at the initiation of higher longitudinal acceleration, and the speed reduction increased with the added longitudinal acceleration. This "substantial increase in longitudinal acceleration is consistent with application of brakes by the flightcrew."

Approximately 15 seconds after touchdown, as the airplane slowed to approximately 40 knots, the magnetic heading started to increase from approximately 10 degrees, reaching 40 degrees 5 seconds later. As the airplane reached 40 degrees magnetic heading, large spikes in vertical, lateral, and longitudinal acceleration were noted, as well as large variations in several other parameters, indicating the aircraft leaving the paved runway surface. The airspeed had slowed to approximately 20 knots when the large spikes in parameters occurred.

DFDR data-based performance calculations showed the aircraft crossed the threshold while at an altitude of approximately 35 feet and 130 knots. Landing roll calculations show a ground

roll of 2,693 feet after touchdown, consisting of 1,016 feet ground roll before braking is initiated and 1,677 feet ground roll from where braking is initiated until the airplane leaves the pavement. The integrated groundspeed of 32.6 ft/sec (19 knots) when the aircraft left the paved surfaces matches the DFDR recorded airspeed of 20 knots.

Subtracting the 2,693-foot ground roll from the runway length of 5,495 feet, indicates the airplane touched down 2,802 feet from the approach end of the runway and 1,958 feet from the displaced threshold.

Saab Aircraft AB provided stopping distances using the accident aircraft weight and speed at braking initiation. According to Saab for a wet runway, the aircraft would have needed 1,989 feet from the time of brake initiation to come to a complete stop. For reference, the dry runway braking distance provided by Saab for the same speed at braking initiation is 1,316 feet.

The SAAB Aircraft Operating Manual (AOM) Part 2, page 25/9 outlines flight procedures for landing. The AOM states in part: The approach should follow at 2.5-3 degrees glide path angle. With an aiming point approximately 1,000 feet down the runway. Start to bleed off speed at approximately 50 feet above the runway. When initiating the flare, gently reduce power to flight idle, immediately after touchdown retard power levers to ground idle. Do not cause the aircraft to float just above the runway by increasing nose up attitude during flare as this increases landing distance. Fly onto the runway near the aiming point. Touchdown with excessive speed may increase landing distance. To achieve maximum braking on wet runways, apply maximum and steady brake pedal deflection.

The American Eagle Airlines, Inc., Aircraft Operating Manual (AOM) Volume 1 outlines procedures for landing. The AOM states in part: Stabilized approaches are essential when landing on contaminated runways. Landing under adverse weather conditions, the desired touch-down point is still 1,000 feet from the approach end of the runway. Touchdown at the planned point. Cross the threshold at Vapp, then bleed off speed to land approximately Vref - 5. A firm landing is better than a "grease job." Keep nose wheel firmly on the runway. Use ground idle after the nose is lowered to the runway. Use reverse, if needed. To achieve maximum braking effect on wet runway, apply maximum and steady brake pressure. DO NOT PUMP THE BRAKES. This will greatly decrease braking efficiency by interfering with the anti-skid function.

WRECKAGE AND IMPACT INFORMATION

The airplane came to rest on a measured magnetic heading of 040 degrees, in a ditch, approximately 175 feet beyond the departure end of runway 01 and aligned with the right edge of the 100-foot wide runway. The 2.5-foot-deep ditch was aligned perpendicular to the runway. Tire tracks from the nose landing gear and both main landing gear tires were found extending from the numbers on the end of the runway through the grass to the airplane. The nose landing gear tire tracks were aligned approximately 2 feet 6 inches right of the runway centerline.

The left main landing gear strut and the nose landing gear strut were found collapsed. The two inboard main landing gear (MLG) tires were found worn. The two outboard main landing gear tires and the two nose landing gear (NLG) tires were unremarkable. The tread measurements were 2/32-NLG tire, 4/32-#1, 1/32-#2, 1/32-#3, and 6/32-#4 MLG tires, respectively.

The left engine propeller blades were found dislodged from the hub housing with associated damage to the hub. The blades exhibited damage consistent with ground impact. The left

propeller spinner/bulkhead was destroyed. The propeller blade actuator was found cracked. The left engine mount was distorted, the bulkhead cracked, and the longerons deformed. At the left flap fairing, the bulkhead was deformed. The left wing rear spar exhibited buckling. The right engine propeller blades remained in the hub; however, all blade tips sustained damage.

Debris fragments impacted both sides of the external fuselage skin forward of the wing leading edges; however, the inner wall liners remained intact and the cabin was not penetrated. The right side skin was punctured between fuselage stations 236 and 258. The right side bottom panel was punctured at fuselage station 329 and between fuselage stations 1622-1624. The left side of the exterior cabin was punctured aft of fuselage station 339, and dented at fuselage station 309. The left side was buckled between fuselage stations 304-319. The lower rear fuselage was deformed between fuselage stations 649-702.

Fire department personnel disconnected the battery. The battery was reconnected by an American Eagle mechanic in order to de-fuel the aircraft prior to recovery from the accident site to the hangar. There were 2,200 pounds de-fueled from the aircraft by maintenance personnel. Fuel samples did not reveal any evidence of debris or contaminants.

The cockpit flap indicator read 15 degrees, the flaps were set for 20 degrees, and an inspection of the extension system confirmed the flaps were extended 20 degrees. The captain's navigation instrument was set on frequency of 108.3 Megahertz, and the communication radio was set on 131.95 Megahertz. The atmospheric pressure was set at 29.96 inches of Mercury on the cockpit altimeters. The antiskid was found in the "ON" position. The color-coded airspeed "V bugs, Vref-red, V-approach green, and V-minimum maneuvering or V clean configuration" were found set on 125 Vref, 130 V approach, and 140 V minimum maneuvering or V clean configuration, respectively.

The hydraulic pump auto circuit breaker was found popped on the captain's circuit breaker panel. The hydraulic anti-skid outboard and the navigation lights wing/tail were found popped on the first officer's circuit breaker panel. The lavatory water heater circuit breaker was found pulled and collared. The fire extinguisher handles were found pulled. The landing lights were in the "ON" position. The clock read 1716. The propeller sync was in the " off" position, and the autopilot and yaw damper were disengaged. The ELT was in the "ARMED" position. The cockpit power condition levers were found in the reverse position and the fuel condition levers off.

MEDICAL AND PATHOLOGICAL INFORMATION

The flight crewmembers voluntarily submitted urine samples for toxicological testing. According to company personnel, the samples showed no indication of drugs of abuse or alcohol present.

SURVIVAL ASPECTS/EMERGENCY RESPONSE

The airport rescue and firefighting (ARFF) station is situated on the east side of the runway, approximately 1,800 feet from the departure end of runway 01. The station is staffed with 2 Municipal Killeen Fire Department firefighters, 24 hours per day.

The captain made an initial notification radio transmission to the Gray Approach Controller about 1914:33. Gray Approach personnel notified the Killeen Fire Department about 1915:50. According to the City of Killeen Police dispatch records, at 1916:48, the fire department and

police units were dispatched to the airport. At 1917:42, police dispatch was advised there were no injuries. Emergency personnel from the City of Killeen and the airport responded in accordance with the Title 14 CFR Part 139 Airport Emergency Plan, Alert 3. The Killeen Fire Department unit and personnel arrived on scene at 1918:34, and at 1924:01 the airport was closed.

The captain had commanded the flight attendant to open the cabin door and evacuate the passengers through the forward cabin door. The firefighters assisted in evacuating the aircraft and securing the accident site. The passengers were transported via ground vehicles to the airport terminal, and according to the police dispatch log, by 1956 the transporting of the passengers was completed.

TEST AND RESEARCH

On March 23 through 27, and on April 10, 2000, the aircraft damage and systems were examined. The nose landing gear (NLG) and left main landing gear (MLG) were found separated at the trunion mounts and folded aft. When the NLG doors and access panels 115AL, 117AL, 118AR, and 116AR were removed, substantial damage was found to the NLG structures in the wheel well and bulkheads. Areas of lower nose skin and forward fuselage were punctured, crushed, wrinkled, and buckled.

When the left hand MLG doors and the lower cowl oil cooler scoop were removed and the cowlings were opened, the left engine nacelle was found deformed upward. Structural damage occurred in the MLG bay area. Several cannon plugs for anti-skid system and wire bundles were found crushed.

Continuity was confirmed for the propeller reverse (beta) linkage and cables from the power levers to the hydromechanical unit (HMU) and propeller control unit (PCU). The engine power controls operated throughout the full range of travel, and the propeller blades cycled through the full range of motion. When the cockpit power control levers were placed in the full aft positions, the right engine PCU was found to be approximately 1/8 inch from contacting the full reverse travel stop. Although the left propeller blades separated from the hub, the internal mechanism was observed for full travel. With rigging pins installed in the cockpit, the left propeller control arm point was approximately 1/2 hole out of alignment. The SAAB Field Service Representative "did not feel this was unusual since two different dash number PCU's were installed on the aircraft, which is a normally accepted practice for the SAAB 340B aircraft." No discrepancies were found during the blade mechanism cycles that would have precluded operation of the propeller and engine controls per specifications prior to the accident.

When the left flap was removed, buckling was found inboard of the left engine nacelle. The left wing rear spar was buckled.

When the cargo bay floors were removed, lower skin damage was found from station (STA) 622.0 to 710.0. The lower support frames were deformed at stations 640.0, 649.0, 585.5, 668.0, 677.0, 686.8, and 694.0, respectively. Two belly skin panels, extending from stations 622.0 and 710.0, were damaged.

The pre-charge for the accumulators (main, emergency, outboard, and inboard) showed 1,650 psi (within serviceable limits = 1,650 +/- 50 psi). The main hydraulic reservoir had approximately 20% remaining fluid with the emergency reservoir at the full line. Hydraulic lines were found ruptured in the left hand MLG wheel well.

The outboard anti-skid circuit breaker (M4) was found popped. Examination revealed that the wires going from the outboard cannon plug to the main bundle were damaged. Wiring damage was also found on the inboard wheel speed sensor cannon plug and the left hand MLG weight on wheels switch. A resistance check on the weight speed transducers indicated they were within acceptable values. Continuity was confirmed from the anti-skid control cannon plugs to the transducers. The left hand inboard transducer had an open resistance due to broken wires at the MLG wheel well. The anti-skid sensors showed wiring continuity when the damaged wires were bypassed. The anti-skid transducers (4), control valves (2), and control box were removed for further examination. According to the operator, the antiskid would be activated under the following condition: power lever below flight idle + 3 seconds; weight on wheels switch to "ground" position for + 3 seconds; average wheelspeed reaching 50 knots. The antiskid automatically cuts out at approximately 20 knots.

On June 6, 2000, the antiskid components were physically inspected and tested under the surveillance of the FAA, at Hydro-Aire in Burbank, California. All components were tested in accordance with the appropriate Hydro-Aire Test Procedure. All four wheelspeed transducers as tested were in a fully functional condition. Both antiskid valves passed all sections of the test procedure with no areas of non-conformance observed. The control box was found to have no areas of non-conformance and no faults were found during any of the tests performed. The unit as tested was in a fully functional condition with no faults.

Continuity was checked for all four MLG weight on wheels switches with an Ohm meter. An open circuit was found in the left inboard switch circuit; however, the wire to connector pin "s" was found severed. Physical damage to the severed wire was consistent with impact overload. The brakes were pressurized to 850 psi and functionally checked within specifications. The brake wear pins showed the brake pads were within specification limits.

The aircraft was equipped with Michelin tires normally inflated to 115 to 123 psi for the main gear tires (specification 24 X 7.7) and 55 +/- 4 psi for the nose. All tires were found inflated and were checked for inflation pressure. The tire pressures measured on April 10, 2000, were the following: #1 100 psi, #2 108 psi, #3 112 psi, #4 93 psi respectively for the main tires. The #1 nose tire pressure was 52 psi, and the #2 nose tire pressure was 51 psi. There was no physical evidence of overheating or flat spots. Tire wear was measured with a vernier caliper, and all tires were within the wear limits specified in the American Eagle General Procedures Manual dated May 29, 1999.

The strut extension was inspected on April 10, 2000, at Killeen, and re-inspected for confirmation utilizing Reference SAAB 340 Maintenance Check Manual Section 32 for main landing gear strut pressure of 570 psi and nose landing gear strut pressure of 186 psi. The left hand strut pressure was found to be 600 psi, the right hand strut pressure 525 psi, and the nose landing gear strut pressure was 225 psi. At the time of the inspections, the airplane had been out of service for 20 days.

ADDITIONAL INFORMATION

The Safety Board was notified of the runway overrun about 2000 on March 21, 2000. The following morning, the NTSB IIC dispatched, and the Flight Recorders and Meteorology groups were formed. Additionally, Safety Board specialists provided assistance in the areas of Aircraft Performance and Airports.

Parties to the investigation were the FAA, American Eagle Airlines, Inc., SAAB Aircraft, General Electric Aircraft Engines, and the Air Line Pilots Association.

The airplane was released to the operator on May 5, 2000.

Pilot Information

Certificate:	Airline Transport	**Age:**	54, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 1 Valid Medical--w/ waivers/lim.	**Last FAA Medical Exam:**	11/18/1999
Occupational Pilot:		**Last Flight Review or Equivalent:**	06/14/1999
Flight Time:	12518 hours (Total, all aircraft), 9251 hours (Total, this make and model), 5538 hours (Pilot In Command, all aircraft), 154 hours (Last 90 days, all aircraft), 75 hours (Last 30 days, all aircraft), 5 hours (Last 24 hours, all aircraft)		

Co-Pilot Information

Certificate:	Commercial	**Age:**	26, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane Multi-engine; Airplane Single-engine; Instrument Airplane	**Toxicology Performed:**	No
Medical Certification:	Class 1 Valid Medical--w/ waivers/lim.	**Last FAA Medical Exam:**	06/23/1999
Occupational Pilot:		**Last Flight Review or Equivalent:**	06/27/1999
Flight Time:	2105 hours (Total, all aircraft), 1040 hours (Total, this make and model), 595 hours (Pilot In Command, all aircraft), 215 hours (Last 90 days, all aircraft), 70 hours (Last 30 days, all aircraft), 5 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Saab	**Registration:**	N353SB
Model/Series:	340B 340B	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Transport	**Serial Number:**	353
Landing Gear Type:	Retractable - Tricycle	**Seats:**	36
Date/Type of Last Inspection:	04/01/1999, Continuous Airworthiness	**Certified Max Gross Wt.:**	29000 lbs
Time Since Last Inspection:	2078 Hours	**Engines:**	2 Turbo Prop
Airframe Total Time:	11976 Hours at time of accident	**Engine Manufacturer:**	GE
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	CT7-9B
Registered Owner:	AMR Leasing Corporation	**Rated Power:**	1450 hp
Operator:	American Eagle Airlines, Inc.	**Operating Certificate(s) Held:**	Flag carrier (121)
Operator Does Business As:	American Eagle	**Operator Designator Code:**	SIMA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument Conditions	**Condition of Light:**	Night
Observation Facility, Elevation:	ILE, 848 ft msl	**Distance from Accident Site:**	
Observation Time:	1915 CST	**Direction from Accident Site:**	
Lowest Cloud Condition:		**Visibility**	1 Miles
Lowest Ceiling:	Overcast / 200 ft agl	**Visibility (RVR):**	
Wind Speed/Gusts:	14 knots / 18 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	110°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29 inches Hg	**Temperature/Dew Point:**	18°C / 17°C
Precipitation and Obscuration:			
Departure Point:	DFW AIRPORT, TX (DFW)	**Type of Flight Plan Filed:**	IFR
Destination:	KILLEEN, TX (ILE)	**Type of Clearance:**	IFR
Departure Time:	1829 CST	**Type of Airspace:**	Class E

Airport Information

Airport:	Killeen Municipal (ILE)	**Runway Surface Type:**	Asphalt
Airport Elevation:	848 ft	**Runway Surface Condition:**	Wet
Runway Used:	01	**IFR Approach:**	ILS
Runway Length/Width:	5495 ft / 100 ft	**VFR Approach/Landing:**	Full Stop

Wreckage and Impact Information

Crew Injuries:	3 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Minor, 32 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Minor, 35 None	**Latitude, Longitude:**	31.085833, -97.686389

Administrative Information

Investigator In Charge (IIC):	JOYCE ROACH	**Report Date:**	06/03/2002
Additional Participating Persons:	Edward J Trayhan; FAA FSDO; San Antonio, TX Lance K McDonald; American Airlines, Inc.; DFW Airport, TX Doug Brazy; National Transportation Safety Board; Washington, DC Donald E Eick; National Transportation Safety Board; Washington, DC Sarah L McComb; National Transportation Safety Board; Washington, DC Daniel R Bower, PH.D.; National Transportation Safety Board; Washington, DC Mark H George; National Transportation Safety Board; Washington, DC Wanda A Kimura; FAA Inspection District Office, ANM-108V; Van Nuys, CA Bo-Goran Windoff; SAAB Aircraft; Linkoping, Sweden, David Gridley; General Electric Aircraft Engines; Lynn, MA Jack L Eppard; Air Line Pilots Association, Int'l (ALPA); Euless, TX		
Publish Date:			
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov, or at 800-877-6799. Dockets released after this date are available at http://dms.ntsb.gov/pubdms/.		