
Runway overrun on landing, Boeing 737-3H4, March 4, 2001

Micro-summary: This Boeing 737-3H4 overran the runway on landing.


Event Date: 2001-03-04 at 2030 MST

Investigative Body: National Transportation Safety Board (NTSB), USA

Investigative Body's Web Site: <http://www.nts.gov/>

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		NTSB ID: LAX011A109		Aircraft Registration Number: N335SW	
		Occurrence Date: 03/04/2001		Most Critical Injury: None	
		Occurrence Type: Incident		Investigated By: NTSB	
Location/Time					
Nearest City/Place Phoenix		State AZ	Zip Code 85034	Local Time 2030	Time Zone MST
Airport Proximity: On Airport		Distance From Landing Facility:		Direction From Airport:	
Aircraft Information Summary					
Aircraft Manufacturer Boeing		Model/Series 737-3H4		Type of Aircraft Airplane	
Sightseeing Flight: No			Air Medical Transport Flight: No		
Narrative					
<p>Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident:</p> <p>On March 4, 2001, at 2030 hours mountain standard time, a Boeing 737-3H4, N335SW, continued off the end of runway 8 during landing roll and came to a stop in a runway construction area at Phoenix Sky Harbor International Airport, Arizona. The aircraft, operated by Southwest Airlines Company as Flight 2021, departed Los Angeles, California, at 1833 Pacific standard time, and was a regularly scheduled domestic passenger flight operated under 14 CFR Part 121. The aircraft received minor damage. There were no injuries to the airline transport certificated pilot, the First Officer, 3 cabin flight attendants or 114 passengers. The flight was operating on an instrument flight rules flight plan; however, visual meteorological conditions prevailed.</p> <p>According to the cockpit voice recorder transcript of the incident flight, at 2000:34, the crew received the Automatic Terminal Information Service (ATIS) information DELTA, which contained, in part, the following: "runway eight last six thousand feet closed. If unable runway eight, advise Phoenix approach on initial contact. runway seven right localizer/DME out of service. wind zero five zero at four. expect visual approach runway seven right or visual approach eight." At 2015:06, the Captain briefed for a visual approach to runway seven right with an "ILS backup." At 2016:08, the crew learned that they would be parking at gate B-17. At 2016:20, following a discussion with the First Officer concerning the proximity of that gate with various runways, the Captain said, "I guess we want uh, eight if we can get it, huh?" The First Officer responded, "yeah, yeah." At 2018:29, Phoenix Approach Control advised the crew to "join the Phoenix runway seven right localizer. At 2018:46, asked approach, "would the north be available by any chance?" Phoenix Approach responded, "I'll put your request down."</p> <p>At 2022:25, Approach advised the crew to "report runway eight in sight." The First Officer responded, "uh, didn't quite understand that, we are requesting runway eight." Approach responded, "report it in sight." There was no briefing for the approach to runway eight. At 2023:01, flight 2021 was cleared for the visual approach to runway eight. Shortly thereafter, the crew began the before-landing checklist, and at 2027:56, the First Officer noted that the checklist was complete. At 2028:03, the flight was cleared to land on runway eight and the tower controller advised that the wind was, "two five zero at four." The target airspeed was 135 knots, and the last airspeed callout, on final approach, was 137 knots.</p> <p>Runway 8 at Phoenix Sky Harbor is 11,000 feet long and 150 feet wide; however, runway enhancement construction was in progress on the eastern 6,000 feet of the runway. Six thousand feet were removed during construction, and 1,000 feet were added to the non-construction section, leaving 6,000 feet available for landing. At 2056, the Phoenix surface wind was from 230 degrees at 4 knots. According to an inspector from the Federal Aviation Administration Arizona Flight Standards District Office, the aircraft came to a stop approximately 75 feet off the usable landing surface. During construction, runway 8 is a visual runway with a Precision Approach Path Indicator (PAPI) visual glidepath guidance system, but without electronic approach path guidance. A Notice to Airmen (NOTAM) was in effect regarding the runway condition. After stopping in the construction area, the</p>					
FACTUAL REPORT - AVIATION					
					Page 1

National Transportation Safety Board

FACTUAL REPORT

AVIATION

NTSB ID: LAX011A109

Occurrence Date: 03/04/2001

Occurrence Type: Incident


Narrative (Continued)


passengers were deplaned via stairs.

The Deputy Aviation Director of the Sky Harbor Airport, Planning and Development Department said that runway 8 was being used as a "visual" category runway. It was lighted and marked as a visual runway in accordance with FAA Advisory Circular AC 150/5340-24. This phase of the construction (west portion of the runway in use) had been in progress since February 18, 2001, and there have been "thousands" of operations on the runway without complaint from operators; although, there has been a "significant" refusal rate among pilots offered the runway. The instrument approach lighting system was not being operated. There were runway end identifier lights (REIL) and a PAPI in operation serving each end of the runway. There are high intensity runway edge lights (HIRL); however, the last 2,000 feet of lighting is not colored amber because this is a visual runway and the amber light requirement in the FAA AC pertains to instrument runways. At the time of the incident there were four runway threshold lights on each side of the runway. The outer-most light was aligned with the runway edge lights and the other three lights spaced inward, toward the center of the runway on 10-foot centers. After the incident, the runway marking and lighting were examined by the FAA and found to be in compliance with applicable ACs. After the incident the number of threshold lights was increased to eight per side (16 total per end), the lenses were replaced and the wattage of the light bulbs was increased. The threshold lights are on a different dimming circuit from the edge lights but were "always brighter." The PAPI is positioned so as to provide a 50-foot threshold crossing height using a 3-degree glidepath. The morning after the Southwest incident the 4-box PAPI serving runway 8 was checked. The first box was found positioned correctly, the second box was 1 -minute off, the third box was positioned correctly and the fourth box was 4-minutes off. Regarding the pilot's report of glare, the Deputy Aviation Director said that the evening hours construction is more than 1,000 feet beyond the end of the runway and later at night they close the runway entirely before working nearer the operational portion of the runway.

The Phoenix Chief Pilot for Southwest Airlines said that the west end of runway 8/26 was completed first and the east end was being completed at the time of the incident. Southwest's agreement with the airport was that there would be 6,000 of usable runway kept open. He thought the PAPI was positioned for a touchdown point about 1,300 feet from the threshold to accommodate Boeing 757 aircraft, the largest aircraft anticipated to use the runway during construction.

The Chief Pilot further said that he examined the runway end environment during hours of darkness approximately 24-hours after the incident occurred. He observed that the red lights laterally outboard of the runway end were not visually conspicuous because of their position outside the pilot's primary field of visual interest (the runway directly in front of him), because of relatively low light bulb wattage and also because of the attenuating effects of the red lens. He also noted that construction was on-going through the nighttime hours on the eastern end of the runway between about the 7,000-foot and the 10,000-foot locations. There was substantial glare directed back toward the runway by construction floodlighting that was partially directed to the west toward the portion of the runway that was operational. As a result of these observations, he directed Southwest Airline's concerns to the City of Phoenix Department of Airports and 3 changes were made: 1) The runway end threshold lights were repositioned within the lateral confines of the width of the runway. The lights then numbered 16 and started at the edge of the runway and were positioned inward toward the center at 10-foot intervals leaving 30-feet clear in the center; 2) The intensity of the light bulbs was increased from 125 watts to 175 watts; and 3) Additional direction was given to the runway construction contractor to control the direction of construction floodlights and reduce glare for aircraft operating on the runway.

 National Transportation Safety Board FACTUAL REPORT AVIATION		NTSB ID: LAX011A109				
		Occurrence Date: 03/04/2001				
		Occurrence Type: Incident				
Landing Facility/Approach Information						
Airport Name		Airport ID:	Airport Elevation	Runway Used	Runway Length	Runway Width
Phoenix Sky Harbor Internation		PHX	Ft. MSL	8	6000	150
Runway Surface Type: Asphalt						
Runway Surface Condition: Dry						
Type Instrument Approach: NONE						
VFR Approach/Landing: Full Stop; Straight-in						
Aircraft Information						
Aircraft Manufacturer		Model/Series		Serial Number		
Boeing		737-3H4		23939		
Airworthiness Certificate(s): Transport						
Landing Gear Type: Retractable - Tricycle						
Homebuilt Aircraft? No		Number of Seats: 145		Certified Max Gross Wt. 130000 LBS		Number of Engines: 2
Engine Type:		Engine Manufacturer:		Model/Series:		Rated Power:
Turbo Fan		General Electric		CFM-56		20000 LBS
- Aircraft Inspection Information						
Type of Last Inspection		Date of Last Inspection		Time Since Last Inspection		Airframe Total Time
Continuous Airworthiness		03/2001		5 Hours		42673 Hours
- Emergency Locator Transmitter (ELT) Information						
ELT Installed? No		ELT Operated?		ELT Aided in Locating Accident Site?		
Owner/Operator Information						
Registered Aircraft Owner		Street Address				
		2833 Shorecrest Drive				
Southwest Airlines Company		City		State	Zip Code	
		Dallas		TX	75235	
Operator of Aircraft		Street Address				
		Same as Reg'd Aircraft Owner				
Same as Reg'd Aircraft Owner		City		State	Zip Code	
Operator Does Business As:				Operator Designator Code: SWAA		
- Type of U.S. Certificate(s) Held:						
Air Carrier Operating Certificate(s): Flag Carrier/Domestic						
Operating Certificate:			Operator Certificate:			
Regulation Flight Conducted Under: Part 121: Air Carrier						
Type of Flight Operation Conducted: Scheduled; Domestic; Passenger Only						
FACTUAL REPORT - AVIATION						

 <p>National Transportation Safety Board FACTUAL REPORT AVIATION</p>	NTSB ID: LAX01IA109
	Occurrence Date: 03/04/2001
	Occurrence Type: Incident

First Pilot Information

Name On File	City On File	State On File	Date of Birth On File	Age 56
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Sex: M	Seat Occupied: Left	Principal Profession: Civilian Pilot	Certificate Number: On File
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Certificate(s): Airline Transport; Flight Engineer

Airplane Rating(s): Multi-engine Land; Single-engine Land

Rotorcraft/Glider/LTA: None

Instrument Rating(s): Airplane

Instructor Rating(s): None

Type Rating/Endorsement for Accident/Incident Aircraft? Yes	Current Biennial Flight Review? 01/2001
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Medical Cert.: Class 1	Medical Cert. Status: With Waivers/Limitations	Date of Last Medical Exam: 10/2000
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- Flight Time Matrix	All A/C	This Make and Model	Airplane Single Engine	Airplane Multi-Engine	Night	Instrument		Rotorcraft	Glider	Lighter Than Air
						Actual	Simulated			
Total Time	11848	6829	29	11819	5000					
Pilot In Command(PIC)	4484	3285		4484	1200					
Instructor										
Last 90 Days	218	218		218	82					
Last 30 Days	93	93		93	50					
Last 24 Hours	8	8		8	2					

Seatbelt Used? Yes	Shoulder Harness Used? Yes	Toxicology Performed? No	Second Pilot? Yes
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Flight Plan/Itinerary

Type of Flight Plan Filed: IFR				
Departure Point	State	Airport Identifier	Departure Time	Time Zone
Los Angeles	CA	LAX	1833	PST
Destination	State	Airport Identifier		
Same as Accident/Incident Location		PHX		


Type of Clearance: IFR

Type of Airspace: Class B

Weather Information

Source of Briefing:
Company

Method of Briefing: Unknown

 <p>National Transportation Safety Board FACTUAL REPORT AVIATION</p>	NTSB ID: LAX01IA109
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	Occurrence Type: Incident

Weather Information

WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
PHX	2056		1135 Ft. MSL	NM	Deg. Mag.
Sky/Lowest Cloud Condition: Scattered			18000 Ft. AGL	Condition of Light: Night	
Lowest Ceiling: Broken		25000 Ft. AGL	Visibility: 10	SM	Altimeter: 30.03 "Hg
Temperature: 17 °C	Dew Point: 5 °C	Wind Direction: 250		Density Altitude: Ft.	
Wind Speed: 4	Gusts:	Weather Conditions at Accident Site: Visual Conditions			
Visibility (RVR): Ft.	Visibility (RVV)	SM	Intensity of Precipitation:		
Restrictions to Visibility: None					
Type of Precipitation: None					

Accident Information

Aircraft Damage: Minor	Aircraft Fire: None	Aircraft Explosion: None
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Classification: U.S. Registered/U.S. Soil

- Injury Summary Matrix	Fatal	Serious	Minor	None	TOTAL
First Pilot				1	1
Second Pilot				1	1
Student Pilot					
Flight Instructor					
Check Pilot					
Flight Engineer					
Cabin Attendants				3	3
Other Crew					
Passengers				114	114
- TOTAL ABOARD -				119	119
Other Ground					
- GRAND TOTAL -				119	119

National Transportation Safety Board

FACTUAL REPORT

AVIATION



NTSB ID: LAX01IA109

Occurrence Date: 03/04/2001

Occurrence Type: Incident

Administrative Information

Investigator-In-Charge (IIC)

RICHARD B. PARKER

Additional Persons Participating in This Accident/Incident Investigation:

PAUL TEXTER

FAA Flt Stnds Dist Office

Scottsdale, AZ 85255