NATIONAL TRANSPORTATION SAFETY BOARD
OFFICE OF AVIATION SAFETY
WASHINGTON, DC 20594

HUMAN PERFORMANCE GROUP CHAIRMAN'S FACTUAL REPORT

Southwest Airlines, Burbank, CA
March 5, 2000
DCA00MA030

A. ACCIDENT

Operator:	Southwest Airlines
Location:	Burbank Glendale Pasadena Airport, Burbank CA
Date:	March 5, 2000
Time:	1811PST[1]
Airplane:	B-737, N668SW

B. OPERATIONS/HUMAN PERFORMANCE GROUP

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[1] All times are in Pacific Standard Time as read on a 24-hour clock, unless specifically noted.

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C. Summary

On Sunday, March 5, 2000, at 6:11 PST, a Southwest Airlines Boeing 737-300, N668SW, operating as flight 1455 from Las Vegas, Nevada, overran the departure end of runway 08 following a landing at Burbank-Glendale-Pasadena Airport, Burbank, California. The airplane traveled through a 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. VFR weather conditions prevailed at the time.

Interview of Capt. Howard Peterson, Human Performance Group, March 14, 2000

D. INTERVIEWS

Interviews were conducted during the weeks of March 6,2000, and March 12, 2000.

The following interview with Captain Peterson was conducted exclusively by the Human Performance Group.

Howard Peterson: At 3,000 feet, he clicked off the autopilot. There was a flight that was pretty close in front of them. He considered that the speed and height were the most critical parameters to him. He could see the airplane in front of him, and he knew where he was. If he had to go around because of him he could always do that.

The previous aircraft became a strong priority when they were on short final when he [the airplane in front] did not clear the runway. When he cleared the runway then it was no longer a factor, probably inside 500 feet coming down. When he first started down he thought about making a 270 and landing on 33, but he had already started down, and did not think about it very long.

He was trying to configure as quickly as he could to slow down, they had a 20 knot tailwind at 3,000 feet. This was pushing them ahead of descent schedule. . That is why he got in a little closer and higher than he wanted., However, they were still getting pushed in, so he started down to get away from the tailwind and that is when he through about doing the 270 But he looked down and thought they would be OK, they would make the slot.

In hindsight, he knows that they did not make the slot. At 1,000 [feet] you want to be fully configured on glide path and on course. At 500 feet you want to be spooled up, at 1,000 feet his airspeed was higher than he wanted and they were still just a little high.

He has made a go around for non ATC reasons. He believes that at SW, in about 11 ½ years he has made about 6 go arounds that he has initiated, for non ATC reasons. He has directed FOs to go around, maybe 5 times.

He did not consider a go around at any point on this approach. The fact that they were late was no factor at all, they were about 2 ½ hours late so they were so far behind schedule, and it was a Sunday so they would have full loads all day so they were not going to make up any time. Also, the daylight conditions, that it was getting dark, played no part in his decision not to go around.

He has flown into BUR before, was very familiar with it. He has flown the rwy 8 approach many times This one was a little different because of the tailwind. He was surprised by it. Lots of times going into BUR, around Van Nuys there are lots of little airplanes so sometimes you stay a little before you come on down.

In CRM training, they have covered parts where one crewmember is not performing properly.

He never felt rushed at 3,000 feet. When he cleared them for the approach he immediately pulled power back. He thought they were in good shape when he got back on localizer. He expected to be outside of Van Nuys but looked down and saw the 20 knot tailwind. Then he was really trying to slow down quickly. Now it was not the normal approach of hitting glideslope, they were starting to get rushed. He was not uncomfortable at that point. When he was 500 feet out he was feeling uncomfortable since they did not have the airspeed he wanted.

He heard the glide slope and pull up GPWS warnings. He disengaged the autopilot when established on the localizer. He thought that the AP was taking its time getting onto the localizer so he disengaged it and turned it manually. He does not know if he went above flap limit speeds. He does not know what the speed was when he went to flaps 40.

He is 95% sure he armed the speed brakes since he used them to get down so he remembers rearming them. He does not remember the 1,000 foot call and does not remember the FO making his 1,000 foot call.

He remembers calling for flaps. When calling for flaps 40 the FO pointed to the speed indicating that they were too fast for it but he, the captain, indicated that when they slowed down the flaps would come down.

He does not believe that he has landed with idle power before at SWA.

He was never in the slot. He continued anyway but he cannot answer why he still continued.

He has never felt pressure from the company, regarding MEL items, maintenance, either overt or covert.

He has not had to fill out forms or talk to people as a result of making go arounds . He does not remember taking an AC over from a FO. He was probably between 2500 and 2700 feet that he no longer considered 33. He looked down and thought that he could make it.

The other times that he has gone around, usually it was because of being too high, probably one or two for excessive airspeed. It would be a result of either excessive altitude or airspeed.

He [JD] was a very good FO. Was very professional did everything the way the company said to do it. Together they decided to do a max performance T/O out of LAS.

At 3,000 feet they were getting busy. Because he could see they were getting high and fast he was trying to get out of tailwind. They were watching the airplane in front. They started on down. He was trying to listen to radios. JD was concerned about being cleared to land. He wanted to check [on the landing clearance] so he did. They were busy. He has been busier before, such as going into an airport with wx, trying to dodge the wx, figuring out if you could skirt around it, with the winds. Sometimes there is another airplane ahead of you on that one too.

He doesn't think that he used the FMS on this one, because they thought they would be landing on 33 or 26 so they didn't set up for that. (They don't use it for tracking below 3,000 feet) He had his FMS page on page 3, which gave him winds. ATC did not indicate a tailwind and does not remember aircraft in front talking about it.

He would expect the FO to inform him if he was outside the established parameters, and he would let him know that he was correcting.

Captain Peterson tried to turn off the runway, but there was a skid. At the very end, if he continued straight, he thought that he might hit the barrier. So he tried to turn but was unable to turn. He estimates that the groundspeed was maybe 25 knots. However they skidded. There may have been an issue with the runway since the end of the runway was slicker than the earlier part. It just didn't seem like he was getting braking action at the point. The airplane felt different. When he started that turn he went from rudder control to tiller.

He is 95% sure that the spoilers deployed. If they hadn't he would have noticed the handle not going back. When doing the evacuation checklist he remembers putting the

handle down. He hit his head when they hit the wall. He believes that he may have hit the map light.

When he touched down he started braking immediately, but doesn't know if he was in max braking. He doesn't remember putting a lot of force on pedals, but thought he was putting pretty good force on them. Remembers putting max braking before starting the turn and he knows that he was hard on the brakes.

SW doesn't use autobrakes. He doesn't remember the antiskids cycling.

72-HOUR HISTORY

CAPTAIN PETERSON wrote a statement that he submitted to the airline, in which he described his activities in the 72 hours preceding the accident. This information is taken from that statement.

March 5

On the day of the accident he reported waking at 0830 local time. He called crew scheduling around 0900, jogged about 4 miles in about 50 minutes and lifted weights and watched television from about 1015 to about 1115.

He left his home about 1330, parked in the employee parking lot, and arrived at the gate about 1400.

March 4

On March 4 he awoke about 0815. He read the newspaper, jogged, lifted weights, and ate lunch.

He watched sports on television from about 1230 to about 1500.

He played tennis from about 1530 to 1800.

He went to a restaurant for dinner about 1815 and returned home about 1945.

He watched television from then to about 2315 and estimates that he went to sleep about midnight.

March 3

On March 3 he awoke about 0830.He read the newspaper and jogged about 4 miles in 50 minutes. He returned about 1030 and watched television while lifting weights, until about noon.

He worked around the house till about 1500, then worked with an accountant from about 1600 to 1700.

He watched television intermittently while working on his taxes.

He had dinner after 1930, then watched television to about 2300. He then read for about 40 minutes and went to sleep thereafter.

March 2

On March 2 he awoke about 0730. He believes that he may have eaten a small breakfast. He left with a friend about 0915 and played 18 holes of golf, which he finished about 1500. He had lunch at the golf course, which he finished about 1630. He then drove home

After arriving home he read the newspaper watched television and lifted weights.

He had a sandwich about 2000. He then worked at his computer on e-mails.

He watched television from about 2200 to about 2300. He read then for about 30 to 50 minutes and then went to sleep.

72-HOUR HISTORY

First Officer J. D. ERWIN wrote a statement that he submitted to the airline, in which he described his activities in the 72 hours preceding the accident. This information is taken from that statement.

March 5-He awoke at 0800 and call SWA scheduling. He checked in and told them that he would report directly to LAS for the trip. He made breakfast for his daughters, then packed.

He left the house at 1000 and caught the 1120 SWA flight form SLC to LAS. He met Capt. Peterson at the gate (for the first time), and they went together to operations. The flight was delayed due to weather in the area and they went to maintenance and watched basketball.

On Saturday March 4 he awoke between 0700 to 0730. He made breakfast for his daughters and then worked outside during the day. He finished about 1700, later had dinner at home and put his daughters to bed. No time given for the time he went to sleep.

On Friday, March 3 he awoke between 0700 and 0730. He stayed home in the morning and made breakfast for his daughters. He flew once that afternoon, an F-16 for the USAF Reserve (419th Fighter Wing @ Hill AFB). He finished about 1800 and picked up dinner to bring home. He went to bed about 2030.

On Thursday, March 2 he awoke about 0700. He made breakfast first for one daughter, then for the second. He took his daughters with him to his Reserve unit where he did some paperwork. He left about 1630. He put his daughters to bed and he went to sleep about 2300.

Interviews conducted jointly-Operations and Human Performance Group

Interview:	Capt. Greg Crum, VP Flight Operations
Represented by:	
Present:	Operations Group and Human Performance Group
Time:	1400, March 14, 2000
Location:	Southwest Airlines Flight Operations, Love Field

Born [redacted]
Date of Hire, Jan. 4, 1979
Got private license at 16, joined USAF in 1970, went to Abilene and flew C 130s, Became AC commander and IP, left June 76, joined military airlift HQ, joined C130 airlift post for 14 months. Left USAF in 6/78, joined SW in Jan 79, starting in AF Reserves at same time. Was active reservist for 3 years. Upgraded to Captain @ SW. In Aug 78 as 737 F/O. Got 737 type rating at UAL in Denver, CO. Upgraded to Capt. in 3/81, upgraded to check airmen in 1985.

Check airman at SW encompasses entire gamut, line checks, sim checks, IOE, etc. Became DAL chief pilot in 8/91, named Systems Chief Pilot in August 95, Director of flight ops in August 97, and VP flight ops in December 99.

He has no personal knowledge of either of the two flight crewmembers on the accident airplane.

He stated that he and Milt Painter share a dual responsibility of overseeing check-airmen. Check airmen report to Milt when they are in flight training and they report to him when they serve under chief pilots. SWA has around 110 check-airmen in total; there are about 10 standards check airmen over them.

The Standards Check Airmen have the primary responsibility overseeing the standardization of the check airman in terms of administering line checks, proficiency checks, etc. Their job is to ensure that the check airmen themselves are standardized, and performing consistent with SWA guidelines. Greg considers their check airmen to be the best in the industry.

With 21 years at SWA he can discuss most aspects of flight operations. He distinguishes between a VMC and IMC stabilized approach. In VMC at 500 feet, a pilot should be in the slot, on glide path, on air speed, and in a position to make a landing. If you don't meet those criteria then you should go around; you are not in a safe position to make a landing. You can back that up to the 1000 foot call where you should be fully configured, then backing up further to meet airport restrictions and the operational restrictions of the airplane.

Criteria at 500 feet VMC include: speed within 5 knots of airspeed, and rate of descent less than 1,000 fpm. You should shoot for flaps to 5 and 170 to 180 knots and on glide slope to get to the fully configured requirement at 1,000 feet.

If F/O calls out airspeed and/or sink rate deviation, Captain should acknowledge and say "correcting." He would think that a go-around would depend on the extent of deviation. If within 6 knots, probably not. That is where judgement comes in. Not familiar with "decision tree" or way of teaching pilots to make these decisions.

He has made go-arounds as a line pilot. He remembers one at rwy 27 at SAN, where you get the Santa Anna winds. He started down at FAF and rwy just dropped out away from him. This was on a –200 so did not have a wind readout but it was obvious that, at no lower than 1,000 feet, he had a "pretty significant tailwind." They, he and the F/O, (He was the Capt.) talked about that for some time. He did not file a go-around report, nor was one required.

SWA teaches techniques for tailwind landings. They don't necessarily train that in a normal PT or PC, but it is in the manual.

He is sure that there is something in the manual regarding short runways but he is not sure exactly what that is.

They do put out information to pilots any time they become aware of climatic effects that everyone needs to be aware of, they will issue either a bulletin, or a "read before fly" to get the info out in a timely manner. He is not sure that they have given anything out on Burbank in this way.

There are 3 books out in the crew domicile:

1. Read before fly: only includes information that absolutely has to be read before that day's flying.
2. Crew Information book: nice to know, may include hotel changes, relevant newspaper articles,
3. Irregularity report book: If Greg sees an irregularity report that he feels all the pilots should see, they will deidentify it and leave in just the overall facts. These are to be read at their leisure.

Pilots are responsible for reading the "Read before fly" book. They don't have to sign it as in the USAF. There is no way either to check to see whether the pilots have read them. If there is real critical information about an airport, they will include that in the dispatch papers to assure that pilots have access to them. They also include Read Before Fly articles on the company website. Within 6 months they hope to establish a method to assure that pilots can read them at home on the company intranet.

CRM started around 1989. They had Dr. Helmreich and Bill Taggart from University of Texas come over and establish it. He remembers going through the check airman CRM

training. Pilots would go through line pilot CRM, and check airman would go through a second one.

CRM given to all new-hires and to Captain upgrades. They also have it integral to emergency procedures training, and other aspects of regular training. They may take a situation that a crew encountered, and ask the crew if they would like to participate in reconstructing the incident. They will develop a visual presentation of what transpired. If the crew agrees, the crew will provide a voice over to the presentation and just go over the whole scenario. This is not "airing dirty laundry" but, here is a mistake that all can learn from. This is done yearly. It is a computerized visual presentation. This is part of the recurrent training. They probably had 4 or 5 situations this year that were covered.

He is notified of all busted check rides, let's say PCs. What happens depends on the severity of the failure. That pilot or crew would go into a debrief with Milt and/or the instructor. They would review the check ride. The check airman will provide a detailed explanation of what he observed. From that Milt will develop a retraining program. May be additional classroom and one or two additional trainers, then an additional check ride. If person fails again, they will go through process again. Three failures and the pilot is terminated, regardless of rank, seniority, etc. In the last 6 months one pilot has been terminated for substandard performance, a new hire. The FAA will become involved after the second failure then it is their option as to whether they will observe the 3rd checkride, as part of their 609 action.

The relationship with POI is excellent. He stated that they are a "Great group of individuals." They hold them to high standards. If they have an inkling that standards are not being met, or training not meeting FARs they don't hesitate to bring it to Southwest's attention. He has crossed swords with them. They, the FAA, have won.

He believes that the quality of surveillance is excellent, he doesn't think that it can get better. He believes that if they were all like the POI and Phil Lerum, he would like even more surveillance ("a hundred of them"). For amount of staffing they have they are providing the absolutely best surveillance that they could.

Pilots do not have to explain delays, diversions, or fatigue calls. He stated that, "this is a marathon race we are running, not a sprint." Over time their pilots will make 99.9% of the time the best decisions based on what they see at the pointy end of the stick. They have strict hiring, based as much on attitudes as much as stick and rudder skills. By the time somebody becomes captain, after about 5 years, they have an excellent aviator in the left seat.

They are different because of who they hire, and because they don't have a hub and spoke system. SWA goes to great lengths to make every airplane look alike. Every –200 is exactly alike (except for 2 of them), every –300 is the same as every –500 and every –700. They want to be quick, but not rushed. Everybody is trained to do his or

her job as efficiently and as safely as possible. Not just cockpit crew but maintenance folks, baggage folks, refuelers, etc.

No changes made in operations at this time based on the accident. Once they determine what happened, they will take a look at what changes need to be made as far as procedures, or areas that should be emphasized. The flight crew is off flying until further notice. No planning to retrain them at this time. He wants to see what all the facts are before he makes a decision.

When a pilot fails a check ride, the check airman keeps a grading sheet that will have every task on the profile that is completed. There will be either an S or a U placed in each box. Each task is numbered and a narrative will be provided on the back. The forms are maintained for 48 hours. There is no reason to keep a document for a "normal, run of the mill PC." If someone is having troubles they will maintain the records because they will have to have them documented for SWAPA.

Crum stated that their relationship with SWAPA is excellent, probably because all pilots at SWA have their roots in SWAPA. They were all members. He is an associate member and was Insurance Committee Chairman for a few years. Milt was a domicile chairman for a few years. At some point in their careers they meandered into management. There is a great deal of respect for SWAPA, but that is not to say that they have not had their differences. They look at a grievance not as a fight but as a way of reaching agreement. Their contract is a living document and over time some changes will have to be made. They represent the pilot group extremely well. They are accused at times of being in bed with each other but that is the farthest from the truth. He believes that their relationship with SWAPA is what every airline should be striving for. They have an excellent Professional Standards Committee. They have a Hotel Committee that surveys hotels in all the cities where they have overnights; they are the ones who sign the contracts with the hotels. SWA has the best quality hotels at the lowest cost in the industry.

Salary based on a trip of 55 minutes, based on concept of short haul carrier. When they started out every trip was 50 to 55 minutes. In this way it is comparable to AA or DL where every trip is one hour. Just their way of adding up the number of trips and hours. This has been modified over the years, still based on 55 minutes, 240 miles. When you bid on a trip for the month, it will have all of the sequences and every sequence will have a value so at the end you can tell how much your trip is worth. If you want to pick up more trips and you are legal to do that, you can. If you want to give away a trip and somebody will take it, you can do that too. If you want to make more money you can and if you want more time off you can. Within the system there is no rationale for a pilot to fly fast or get in early since if you get in early you will get paid for the trip, but if you get in late, you will start getting 1/10 of the trip for every 5 minutes. They are paid for wx and maintenance cancellations. If a pilot blocks in more than 11 minutes late, they will get paid more.

Captains have a proficiency check/proficiency training every 6 months. The system that they have in place has served them well for 29 years. They don't believe that changing mid-stream would serve the company or pilots well. There is something to be said for bringing in pilots every 6 months, even if it costs the company more. He is thankful that the company has allowed flight ops to make decisions based on safety and not on bottom line. If you look at the airplanes and the equipment that has been put in, none of it would pass a cost/benefit analysis, for example they installed HUDs, predictive and reactive windshear, and alternating landing lights for safety benefits. These items cost the company a lot of money, but there is a huge safety buffer that this provides.

They have about 3250 pilots on board. They have hired 350 in 1999. A number of factors required hiring more pilots than anticipated, more rest rules required by FAA, and side letter with SWAPA on life style issue. He estimates that about 100 were hired because of those two. Of the remaining 250 about 95% due to growth and 5% due to retirement and medical LOAs.

They anticipate hiring between 300 and 350 pilots in 2000. They will net 32 additional airplanes, they will get 31 from Boeing, leasing a –700 and will phase out 2 –200s. By the end of 2000, they will have 33 –200s, 25 –500s and 185 –300s and the rest –700s. Pilots have a common line and they can fly any type on any one day. The –200 has analog instruments, where the –700 has LCD displays. One of their goals, as the launch customer for the –700, was to do their best to replicate the round gauges on a flat panel display so that there is not a huge transition. The only real difference is the map display, which is not on the –300 or –500, but is on the –700. FMS is installed on the –300, -500, -700. They are trained to use the FMS. They don't use it for approach. Basically they use it for replicating your flight plan and can only be used above 3,000 feet. They have not taken that next step for using it for arrivals. They are contemplating it and will take that step later in the year. They use it as a "direct to" tool. They have not activated vertical nav mode of the autopilot and have deactivated autothrottles years ago. It is their philosophy that once you take the throttles out of the hands of the pilots they become monitors and they want pilots flying the airplane and not monitoring it. Certain aspects of FMS can be used for performance but their main performance tool is the OPC, onboard performance computer, which is on all airplanes.

Passing 18,000 you will conduct approach descent check. This includes reviewing wx, 10-7 page for any information regarding arrivals, this is a historical document about problems about that particular airport, would brief Jepp page, brief flap setting, Vref and target speed, and who will fly approach. If runway changed thereafter, crew will have to give a modified briefing of any changes, reconfirming flap settings, and discussing any changes, including environmental changes that they need to be aware of.

If there is no time to brief the new approach they need to make time, by holding, vectors, etc. The last thing you want to do is put yourself in a rushed environment.

SWs check airman are better than others based on operational history, which includes 29 years without a fatality, and operations out of MDW and Detroit city without any

incidents. Up until Sunday they operated in Burbank without an incident. The low number of violations they have, their safety record, the standardization program, have a huge impact on the safety record. They have lost a few check airmen because they did not meet their attitudinal standards; they were overbearing and stuck out like a sore thumb. They advised them that they were no longer needed as check airmen. They want their check airmen to be professional and caring. They should share the philosophy that safety is paramount they should treat their fellow airmen in a kind and caring manner.

SWA has no plans to go to AQP. It was considered but it goes back to SVT, no plans to change. FAA is not encouraging them to switch. They meet with FAA once a month. They discuss all the issues at hand, all the possible FAR modifications, they look at training and all programs that are available and this is one that they have discussed.

Pilot must have 2,500 TT, 1,000 PIC in turbine or jet, 15 hours of pure jet time will bring down time. They had required a 737 type rating, but they revised to allow someone who meets minimal criteria to apply. Decision board, 6 chief pilots, Milt, and Human Resources, approve. If they approve, someone without a 737 rating will be offered job provided that they get their type rating. All get 3 one-hour interviews. Attitude is primary thing they look for. After 3 interviews are completed, that group will provide overall grading sheet recommending person for hire or not. After the person goes through interview process, background check, etc. then they go to decision board. About 50% of applicants are recommended for hire. Probably about half of those 50% are offered jobs.

New hires are equally split between military and civilian. No specific military person they look for. They look for more who the person is, attitude, letters of recommendation. Civilian is same thing.

Less than 2% bust check rides. Less than one pilot per year busts two checkrides, Neither of these accident pilots busted two checkrides. They have number of avenues if pilots complain about others, including Professional Standards and a no-notice line check, that occurs less than once a year. Professional Standards route or to a sponsor, might be twice a year. Not aware that any of these avenues taken with the two accident pilots.

Their pilots fly the airplane. They don't have the amount of automation that other airlines do. The other distinguishing mark is the pride the pilots have in themselves. They are proud of the relationship they have between themselves and other employees. Pilots are not looked at as prima donnas, but are looked up to because of their position. Pilots are pro-company. Same percentage of profit goes to all employees, based on their salary the year before. This year 14.1% of salaries last year will go to profit sharing. Pilots have unique stock option plan. They were the first group to have this and other groups followed on, including dispatchers. The environment that they have set forth here is that safety is Number 1. This philosophy is portrayed through the training they receive and the review of the incidents. There is no pressure from management to get

the mission completed, nor is there any follow up on fatigue calls, diversions, delays. He believes that this is the basis and theme for the pilot group and he hopes that the pilots always think of safety first. It takes courage to make those decisions because you have to fight the subtle pressures that you allow to build on yourself.

Crum stated that he visits every upgrade class and as many recurrent training classes as he can. He stated that 65% of his pilots are commuters, in fact he commuted to Houston for 5 years. Pilots usually bid lines to get them home the quickest way possible. Sometimes that time frame is as short as ½ hour between landing and the last airplane that can get you home. If pilots allow it, that could induce pressure. Pilots have to deal with delays; sometimes there are 137 passengers in the back who could get upset. The pilots need to question whether they can make a safe approach or whether they should hold, or divert. If they divert, the Captain must explain the delay to the passengers.

He went to Little Rock for 3 days to observe the AA accident. They had just gone through a rewrite of their corporate emergency plan and they wanted to see from the hearing how AA reacted to their accident. This was an accident they felt could possibly happen to them. SWA had an airplane 30 minutes behind 1420 going into Little Rock. Even though he had been to the school it was important that their go team observe. They have made no changes in training or procedures as a result of the AA 1420 accident.

Interview: J.D. Erwin, F/O (second interview)
Represented by: David McCracken, Attorney
Present: Operations Group and Human Performance Group
Time: 1400, March 14, 2000
Location: Southwest Airlines Flight Operations, Love Field

DOB [redacted]
DOH: 11/96
Flew USAF—F-15 and in the Reserve F-16s
About 3,000 hours as FO in 737, all with SWA
PIC time: 2,000 to 3,000

They came to a halt in the street. He reached up and hit the pressurization switch. He knew the flaps were down. He asked the captain if he was OK, The captain said yes, then he said that he would have to go back to reassure passenger and see if everyone was OK. The captain made a PA to remain calm. The earpiece would have been out of his ear so he is not sure whether he heard the captain over the PA or just in the cockpit.

As he got to the back, the forward service door, the slide had inflated inside the galley, he does not remember if the cockpit door was open or if he opened it. There is a gray haze in his memory there and has gone back and forth and it is still not clear that he has a complete picture of it. As he left the cockpit the A flight attendant was talking to him. The passengers were "extremely calm." A few had gotten up but most were seated and very quiet. One of the flight attendants could not move her arm to get out of the harness, so she was pinned in as a result of the slide that had inflated inside the cabin. He glanced back into the cabin and saw extreme calm. Everybody was calm, at the most some were standing in their seat rows but most were seated. He thinks that the back door was open, but he does not know for sure. The slide at the main cabin entry door, on the captain's side, had not been deployed. He then helped the flight attendant who was pinned get free. Now people were starting to exit the plane and the flight attendants were doing a superb job of getting everything going. He went out the front door and he jumped down onto a fire hydrant as a step.

According to the manual, there are some checklist items to be accomplished by the F/O, but his main role in the evacuation is to assist in deplaning. As he came off plane it was obvious that a large number, probably 20 some people had come out from the SWA ramp, and were helping them deplane the pax. He assumes that they were SWA people, he remembers seeing one, Jon Weaks, a captain with whom he had flown. Jon asked if he was OK and he said that he was fine.

He then went to the left rear side and saw that at least 4 people were assisting people get off from that end, then went to the other side and saw the same thing. He does not think that anybody was going over the wing. He remembers another captain, Robert Seltzer and a F/O came to help. Somebody said let's get everybody going in the same direction. Again on the F/O's side over wing here were people helping everyone get off. On the captain's side over wing were the fewest people helping. For the most part,

everything that he thought would be his duty, from catching people to huddling them together, was being taken care of by other people.

He then went back on the airplane to see how the captain was doing. He believes that the captain was still on the airplane, although his memory is still a little fuzzy. He still was not aware that Howard (captain) had been cut. He then got out again to make sure that things were still OK outside. There was some fuel dripping off of the left wing but he did not perceive it to be a large problematic leak.

By this time Howard came to the door and this was the first time he noticed that Howard was bloody. He was concerned about the captain going into shock. He went back into the cockpit, got his jacket and took it back to him. For the most part he stayed with the captain, on the curb next to the gas station. Jon Weaks seemed to have a better grip of what was going on than he did. He did not know what he did after that. He just stayed with Howard. Jon was making phone calls and getting other people to do what needed to be done. Jon told them to sit there, that there was an ambulance coming. He doesn't remember seeing crash trucks. He believes that the evacuation proceeded by company regulations.

He helped a couple of people off of the wing at the very end.

He feels no undue pressure from the company to complete the mission. He does not have to fill out a form if he goes around.

He did not get training in a sim on tailwind scenarios, and did not get sim training that he could remember for landing on short runways,

There are some procedures, such as using the OPC, to aid you in making the approach. You are not required to use the OPC for every landing. He has used the OPC as he saw fit or as directed by the captain. They are required to use it for every take off.

No specific training for "slam dunk" approach, when you are required to come in high.

F/O Erwin stated that, according to company procedures, most go-arounds occur in IMC, e.g., when you cannot see the field, one dot above or below on ILS, or not in position to land. The captain directs to go around. No report is required for a go-around.

Not all checklists were completed on this flight. The captain called for the final/descent checklist and he asked for this at a time when F/O had started a radio call to ATC to confirm landing clearance and F/O did not get back to him. That is the only item he feels was not completed. When they got the first ATIS he and captain did talk about it, since it was VMC was not an official briefing. On ATIS they were using two runways. There was a discussion on if they could even land on 26 and neither one wanted to do that, they wanted 33. He looked at the 10-7 page to see if there was guidance. He could not find anything on the 10-7 page that denied landing on 26. He did not use the

OPC for landing. The next ATIS (P) came on and the winds were "significantly different," the first set of clouds were no longer mentioned, slight temp difference and the runways in use were now 8 and 15. It was VMC so that said that they would shoot the visual to 8 with a back up ILS. Did not use OPC for runway 8.

He did not hear ATC ask the captain to keep speed up since he was on the ATIS. When he got back on the freq the captain told him about the speed restriction. The Captain made no additional comments about speed that he could remember. This did not seem unusual to him; he just assumed that they were trying to sequence them. This has happened before where approach told them to keep their speed up.

He believes that the he first remembered the Captain slowing the airplane as they intercepted final. He believes that the captain used his speed brake. At this point, they were turning from a southerly to easterly heading, although he does not notice exactly when the captain started to slow down. The Captain also lowered flaps. Then, when he recognized that he was high he lowered the gear. He did not remember what the captain said but he could recognize that the captain saw what he saw, i.e., that they were high. He does not remember what he said, but the captain made some comment and that led him to believe that the captain recognized the situation.

At that point he noticed that they were a lot closer to the airport than he had anticipated. The runway was lower in the wind shield than he had anticipated. He did not verbalize any concern to the captain.

His navigation radio was set to Van Nuys and the Captain's was set to Burbank runway 8 ILS. The Captain had the autopilot on and the VOR/LOC selected. He felt that they were going to overshoot but the VOR/LOC mode captured and corrected. He does not recall when the Captain clicked it off. At this point, he thought that the approach was going to take some maneuvering since they were not on glide slope. He was concerned and recognized that it was not a "picture book" approach, but he was not overly concerned. He did not say anything to the Captain since every time he was about to say something he could see that the captain was correcting. There was not a time when the captain didn't seem aware of the situation.

He termed the approach as "close", but he never felt it reached the point, that required him to call go around. He looked down to progress page to check, but his attention was redirected outside. He glanced down but did not see it. He believes that the airplane had a ground speed readout but he does not remember what it was reading.

This was his first trip with the captain. He was not intimidated by the Captain at all. He does recall leaving 3,000 feet. He saw the VOR needle swing past 9:00 and he was about to say something to the captain about getting down and the Captain had started down. He thinks that the captain called for the gear as he started down. He believes that they had 5 flaps. The call, gear down, flaps 15 all happened very fast. After that he said either 25 or 30 flaps. He then called for 40 flaps. He believes that he saw flaps 15 verified on the gauges. He does not know if flaps ever reached 40 degrees. He did not

make a comment but pointed to the air speed indicator and Howard said that he was aware of the airspeed. At this time the airspeed was roughly 180 knots.

Right about that time, when they called for flaps 30, they started to get the GPWS, as Howard was doing a steeper than normal descent to try to get down. He does not recall the specific warning. In simulator sessions they have gotten GPWS warnings before. When they receive the warnings in the simulator, in IMC, procedures generally require them to do a go around. If they receive "terrain, terrain" they would go around, and if "glide slope" they would go around. These warnings are trained this way at SWA.

He does not get nuisance GPWS going off into BUR, but does get them going into SAN, since you have to clear the parking garage and immediately descend. When you approach Ontario from the north, receive it.

He remembers their airspeed being about 180 knots at one point, and he saw it go as high as 190 knots, right when he pointed to the airspeed. Did not notice it again before touchdown. He does not recall leaving 1,000 feet. He does not recall call-outs. The company requires callout at 1,000 feet by both of them. Throughout whole approach his attention was primarily outside, in his judgement that was what needed his attention and that was where the priority was. He did not call out airspeed deviations to the captain. The Captain was aware the airspeed and he knew it. He knew this by the Captain's actions rather than by what he said. He does not remember what the captain said.

He does not recall leaving 500'. The company requires the FO to call out every 100 feet down to 100, from 500 down. He did not make these callouts. He focused his attention outside. Looking outside he saw corrections, and was watching the aircraft ahead, which they were gaining on. He did not remember if ATC had cleared them to land. He wanted to make sure that he had landing clearance. He uses a boom mike so he does not have to look inside to use the mike.

The approach never looked "unmanageable", although it did appear to be "out of the slot." He did not mention this to the captain as the captain was correcting back to the slot. There was no discussion of using another runway at that time. He did not remember any discussion after turning to final. Being in the slot means airspeed, glide slope, in a position to land.

He did have a perception that the aircraft was fast. While they were not fast airspeed-wise, the tailwind was pushing them closer. When the Captain called for flaps 30, he looked at the airspeed and knew they were fast.

The deck angle did not look unusual to him nor did the attitude at touchdown. When asked how the 737 flares, he reported that it does not flare like a T-38. He was not specifically aware of a tailwind on this approach. He did not know what the winds were at altitude. He wasn't sure why the picture looked the way it did. He didn't register the information on the progress page. Does not remember if tower reported winds to him.

The Captain gave him an initial brief when they first met. [These are my words] He said that I like company procedures, I don't do things dumb, dangerous, different" and if you see anything, speak up.

When he got back on the frequency from getting the ATIS information, Captain Peterson told him that ATC told him to maintain 220 or greater. He stated that, procedurally, you don't make a call out if the other pilot is making a correction. In IOE, they are taught that the fastest way to bring the airplane down is to get the aircraft "completely dirty", then go down. In this case, it did not appear that this would work because they would not make the airport.

He noticed that the airspeed was about 200 knots when the Captain called for flaps 15. This is 5 knots over flaps 15 speed, and F/O went ahead and did it. The captain called for gear and flaps at the same time so the F/O assumed that the speed would come down. Book calls for a go around if you are not in the slot. Because of the way they were being pushed, he thought Howard's maneuver to get down was the best.

He has been with SWA 3 ½ years. He has seen approaches like this where you had to get down or were a little high for some reason, but not to this degree. He has seen approaches out of the slot, where the Captain did not make a go around. Has seen aircraft out of parameters at 1,000 feet, but it is hard to say if they were as far out of parameters as this one was since he was looking outside. He has not had anyone ask for flaps 40 when they were at 180 knots. Has had it at 150 but not 180.

He went into Reno some time ago, thought they could maintain VMC, GPWS went off and they took corrective action. If not aware of where you are you must go around if GPWS goes off. GPWS warning, such as sink rate, going around will depend, if in VMC or not.

He has flown into BUR before, in January at least once every trip, but he cannot give an exact count.

He does not remember any specifics in CRM training about questioning PIC. Main goal of CRM is to work as a team, they all contribute to a goal. Does not remember CRM training dealing with disagreement.

He was never scared by what he was seeing on the approach. During the first portion of approach the lighting was such, with the sun and ground lights, it was difficult to see company traffic ahead of him. The street lights were becoming prominent. The traffic ahead continued to be the primary concern until they (company traffic) pulled off the runway. At this point they were just about ready to land. The Captain had maneuvered the aircraft, such that altitude-wise they were in very good shape to land.

He stated that he has no personal parameters for go-arounds. To make go around decision, you must have more of a picture of being pretty high. In terms of his priority of importance, he considers being lined up and being at a reasonable altitude.

About halfway down the runway he saw that they were having difficulty stopping. He doesn't know the point at which he could tell that they were in difficulty. They were 2 hours late leaving LAS, but he never felt rushed. He was not uncomfortable but when passing Van Nuys he was concerned because things were happening faster than he anticipated. Has never been uncomfortable before. Has been on flights where they landed unspooled. (Group consensus was that the meaning of the word "unspooled" was idle power)

Never taken an aircraft from a captain nor has he ever considered it. Did not consider it on accident flight except for pushing the brakes.

In CRM he was trained to handle situations when other crewmember is not following SOP. He does not remember, but knows that he was trained for it, but cannot describe the specifics. He stated that he should have told the Captain that they were not in a position to land.

He thought that the approach appeared manageable. The Captain was correcting and the corrections seemed to be working. He thought the Captain could salvage the approach.

He had not thought about the airspeed when he lowered the flaps. He does not remember being bothered by it. When the Captain asked for flaps 30, F/O Erwin pointed to the airspeed gauge. The Captain said that he was aware of the speed. F/O Erwin thought they would get down, bleed off the excess speed, and perform the approach.

F/O Erwin reported that he had made 5 to 10 go-arounds, all ATC directed. He thought Captain Peterson was very good and professional. It was a very short flight and F/O Erwin was impressed by the way they had discussed things.

When asked about his expectations when ATC told them to maintain 220 knots, he said that generally ATC tells you to resume normal speed or they tell you to slow down. On this flight he does not believe they told him to resume normal speed. If ATC doesn't call and ask them to resume normal speed, they should ask. He felt that ATC needed them to maintain 220 for sequencing and did not consider it unusual. He felt that the Captain agreed since he did not question it.

F/O Erwin reported that SWA philosophy teaches that the captain is in charge.

Does not remember if the ground spoilers (speed brakes) deployed. On final, if not before, you check that the speed brakes are armed. The captain physically arms them and the PNF reads the checklist. The captain did arm them, he knows because he counted 5 green lights, (3 gear, wing flaps and speed brake arm). He believes that they came out because he saw the handle come back. SWA procedures are to manually deploy if they do not deploy.

He believes that they were getting 6 knots of wind, right quarterly head wind on landing. Had it been a tailwind, the briefing would still have been the same.

He has 12 years of active duty in the USAF. SWA was his first choice of airlines. He had worked full time in the reserves and intermingled with a number of DL, UA and AA guys. He did a year at Luke and met a number of SWA guys, they seemed to be the happiest and most content.

He does not feel that it is the crew's option to deviate from manual.