



**PARTY SUBMISSION OF
SOUTHWEST AIRLINES PILOTS' ASSOCIATION
TO THE NATIONAL TRANSPORTATION SAFETY BOARD**

SOUTHWEST FLIGHT 708 (SWA708)
KAUS – Austin-Bergstrom Intl. Airport, Texas
04 February 2023

NTSB DCA23FA149

In accordance with Title 49, CFR § 831.14, Southwest Airlines Pilots Association (SWAPA) submits its proposed relevant factual record, proposed probable cause and contributing factors, and proposed safety recommendations designed to prevent future similar incidents or accidents. This Submission does not attempt to address all of the issues that arose during the course of the investigation. It focuses on what SWAPA believes are the significant findings to be drawn from the evidence made available to it.

SWAPA notes that it was not invited to participate on the Air Traffic Control Group. SWAPA does not believe this is in the best interests of safety since SWAPA could have provided valuable information and insight from the operator/pilot perspective. The decision to exclude SWAPA, Southwest Airlines, the Air Line Pilots Association (ALPA), or Federal Express from participating in the Air Traffic Control (ATC) Group overlooks the essential and critical role that operators and pilots have in the Air Traffic Control system and the interaction and relationship between pilot and controller necessary for the safe operation of aircraft throughout the National Aerospace System (NAS).

We reserve the right to supplement or amend this Submission if additional information is made available.

I. Relevant Factual Record

On February 4, 2023, about 0640 Central Standard Time (CST)¹, Federal Express (FedEx) Flight 1432 (FDX1432), a Boeing 767-32LF, and Southwest Airlines (Southwest) Flight 708 (SWA708) a Boeing 737-79P were involved in a runway incursion with overflight that resulted in a loss of separation at the Austin-Bergstrom International Airport (AUS), Austin, Texas. SWA708 was a regularly scheduled international passenger flight operating under the 14 CFR Part 121 from AUS to the Cancún International Airport (MMUN), Cancún, Mexico. FedEx1432 was a domestic cargo flight also operating under 14 CFR Part 121 from Memphis International Airport (MEM), Memphis, Tennessee to AUS.

KAUS had a federally installed and maintained Automated Surface Observation System (ASOS) that was augmented by contract weather observers, who were located on the second floor of the control tower in a window less office at the time of the event. Air Traffic Control Group Chair's Factual Report, page 11.

The following Meteorological Aerodrome Reports (METAR) was the most current report for AUS prior to the incident.

LIFR SPECI KAUS 041218Z 0000KT 1/4SM R36R/1800V2400FT FZFG VV002
M01/M01 A3043 RMK AO2 T10061006=

KAUS special weather observation at 0618 CST (1218Z), wind calm, visibility 1/4 mile, runway 36R runway visual range 1800 variable 2400 ft, freezing fog, vertical visibility 200 ft agl, temperature -1° C, dew point temperature -1° C, and altimeter 30.43 inches of

¹ All times in this Submission will be local time (CST) unless otherwise indicated.

mercury (inHg). Remarks: automated station with a precipitation, temperature -0.6° C, dew point

Just after the incident occurred at 0640, KAUS issued the following special weather observation.

LIFR SPECI KAUS 041247Z 00000KT 1/8SM R36R/1800V2400FT FZFG VV002
M01/M01 A3043 RMK AO2=

KAUS special weather observation at 0647 CST (1247Z), wind calm, visibility 1/8 mile, runway 36R runway visual range 1800 variable 2400 ft, freezing fog, vertical visibility 200 ft agl, temperature -1° C, dew point -1° C, and altimeter 30.43 inHg. Remarks: automated station with a precipitation discriminator

Meteorology Specialist's Factual Report, page 6.

According to air traffic controllers in the tower cab during the time of incident, they were above the fog at the tower cab level at about 200-300 ft AGL and had unlimited visibility on top but were unable to see the surface, including any of the ramp area or runways, due to the fog and the time of day. Meteorology Specialist's Factual Report, page 6. The controllers also stated that they would lose visual sight of arriving aircraft at approximately 300-400 feet AGL on approach as they "dipped down into the cloud." ATC Group Chair's Factual Report, Attachment 5 – Interview Summaries, Page 23 (Damian Campbell).

The AUS Low Visibility (LVO)/Surface Movement Guidance and Control System (SMGCS) Plan was not in effect at the time of the accident since the Runway Visual Range (RVR) for the approach end of RWY 18L was not below 1200 feet.²

The AUS control tower is not equipped with any form of surface surveillance/detection capability (i.e., ASDE-X). ATC Group Chair's Factual Report, Attachment 5 – Interview Summaries, page 20-21 (Damian Campbell).

On the morning of the incident, there were five Certified Professional Controllers (CPC), one CPC-In Training (CPC-IT), and one Operations Supervisor (OS) on duty at the AUS Air Traffic Control Tower (AUS ATCT). ATC Group Chair's Factual Report, page 15. The CPC-IT (fully certified in the tower, but still in training in radar) and OS were on the tower cab. *Id.*

² The Austin Airport Traffic Control Tower and City of Austin Department of Aviation Letter Of Agreement (LOA), effective December 9, 2013, states that the LVO/SMGCS Plan is to be implemented when the RVR "is below 1200 feet" (emphasis added). ATC Group Chair's Factual Report – Attachment 9, page 2. In relevant part, the LOA defines RVR as "the horizontal distance a pilot will see down the runway from the *approach end*." (emphasis added). *Id.* Further, the Operations Supervisor (OS) on duty at the time of the accident noted that the SMGCS Plan was not activated because the RVR was not consistently below 1200 feet. ATC Group Chair's Factual Report, Attachment 5 – Interview Summaries, Page 178 (Susan Green). In fact, the approach end or Touchdown RVR (TD-V) had only been reported as below 1200 feet once in the 11 reports provided by the local controller since signing into the position until FDX432 had checked in, and that was the first report that the local controller had provided on his shift and was at 0548:36. ATC Group Chair's Factual Report, page 5.

The Local Control West (LCW) and Local Control East (LCE) positions were combined and being worked by the CPC-IT from the Ground Control East (GCE) position (hereinafter referred to as the “LCE controller” or the “local controller”). The Ground Control West (GCW), Ground Control East, Clearance Delivery (CD), and Tower Oversight positions were combined and being worked by the OS from the Clearance Delivery position.

The LCE controller provided services to both FDX1432 and SWA708 at the time of the incident. In the tower cab, the LCE controller had access to RVR data both from the RVR Display Panel and the RVR Display on the NAV Information Display System (NIDS)³, which is located at the LCE Controller location in the tower cab. The tower cab also had an operating Digital Bright Radar Indicator Tower Equipment (DBRITE) Display.⁴

The LCE controller rated the traffic volume at the time of the incident as a 1 or 2 on a scale of 1 to 5, with five being high volume. ATC Group Chair’s Factual Report, Attachment 5 – Interview Summaries, Page 21 (Damian Campbell). With regard to traffic complexity, the LCE controller rated the complexity as a 3 or 4 on a scale of 1 to 5, with 5 being more complex, due to have no ground visibility and no ASDE-X. *Id.* at page 22. The Operations Supervisor (OS) on duty at the time of the incident, who was working the Ground Control and Clearance Delivery positions, rated the traffic volume as a 1 or 2 and the traffic complexity as a 2 due to the fog. ATC Group Chair’s Factual Report, Attachment 5 – Interview Summaries, Page 152 (Susan Green)

After pushing from the gate, deicing, and performing all applicable checklists, the SWA708 FO contacted Ground Control for a taxi clearance. Operational Factors, Attachment 2, SWA Pilot Interviews and Transcripts, page 14 (Capt. David Elliott); Operational Factors, Attachment 2, SWA Pilot Interviews and Transcripts, pages 12-13 (First Officer Michael Brock). Ground Control instructed SWA708 to taxi via TWY GULF 2 to TWY GULF to TWY BRAVO and to report when established on TWY GULF. Operational Factors, Attachment 2, SWA Pilot Interviews and Transcripts, page 14 (Capt. David Elliott); Operational Factors, Attachment 2, SWA Pilot Interviews and Transcripts, page 13 (First Officer Michael Brock). SWA708 reported when they were established on TWY GULF and then Ground Control instructed them to monitor Tower frequency. Operational Factors, Attachment 2, SWA Pilot Interviews and Transcripts, page 14 (Capt. David Elliott); Operational Factors, Attachment 2, SWA Pilot Interviews and Transcripts, page 13 (First Officer Michael Brock).

ATC audio recordings show that at 0634 FDX1432 established communication with the LCE controller and reported their flight was inbound and established on a CAT III instrument landing system (ILS) approach to RWY 18L. At this time, FDX1432 was roughly 15 miles from the airport and descending through 5,400 feet msl. The LCE controller provided the FDX1432 crew with the

³ NIDS integrates a number of systems and displays traffic, weather, and surveillance data in an easy-to-use and fully customizable workstation with a touchscreen display.

⁴ DBRITE is a display system used by controllers to assist them in identifying and monitoring aircraft—it is not a radar system and is not used in the radar control of air traffic.

runway visual range (RVR) values and cleared them to land.⁵ The FDX1432 pilots acknowledged this information. The LCE controller stated that he could see the landing light of FDX1432 during their approach until approximately 300 – 400 feet AGL when the aircraft entered the fog layer. ATC Group Chair’s Factual Report, Attachment 5 – Interview Summaries, Page 23 (Damian Campbell).

At 0638:47, while taxiing on TWY BRAVO, roughly 550’ from the RWY 18L Hold Short Line, the First Officer (FO) of SWA708 checked in with the LCE controller and stated they were “short of 18L” and were ready for takeoff.⁶ FDR and ADS-B Study, Aircraft Performance Study, page 6.

At 0638:58, the local controller provided SWA708 with the current RVR values, advised them that a FedEx 767 was on a three-mile final (FDX1432), and issued them a takeoff clearance⁷ from RWY 18L. *Id.* The LCE controller did not request that SWA708 report when they started their takeoff roll.

The LCE controller stated that his “rule” for spacing arriving and departing aircraft is “two increasing to three,” which he explained means that “when the aircraft on approach is two miles the departing aircraft needs to be on his roll already.”⁸ ATC Group Factual Report, Attachment 5 – Interview Summaries, page 37 (Damian Campbell). He stated that he uses the radar display on

⁵ According to the FAA Pilot/Controller Glossary, “Cleared to Land” is defined as “ATC authorization for an aircraft to land. It is predicated on known traffic and known physical airport conditions.” FAA Order JO7110.65Z, Appendices PCG-1, page C-3.

⁶ The NTSB’s Aircraft Performance Addendum, which studied the 10 flights (all Part 121 departures, 8 from RWY 18L and 2 from RWY 18R) handled by the LCE controller since beginning his shift on the morning of February 4, 2023 until SWA708, determined that 2 aircraft reported to the LCE controller that they were ready for takeoff while at the Hold Short Line and the 8 other aircraft reported ready for takeoff between 200 feet and 1000 feet before the Hold Short Line. The average distance was 485 feet from the Hold Short Line.

⁷ According to the FAA Pilot/Controller Glossary, “Cleared for Takeoff” is defined as “ATC authorization for an aircraft to depart. It is predicated on known traffic and known physical airport conditions.” FAA Order JO7110.65Z, Appendices PCG-1, page C-3.

⁸ FAA Order JO7110.65Z Section 5-8-4, DEPARTURE AND ARRIVAL, states:

TERMINAL. Except as provided in paragraph [5-8-5](#), Departures and Arrivals on Parallel or Nonintersecting Diverging Runways, separate a departing aircraft from an arriving aircraft on final approach by a minimum of 2 miles if separation will increase to a minimum of 3 miles (5 miles when 40 miles or more from the antenna) within 1 minute after takeoff.

NOTE-

1. This procedure permits a departing aircraft to be released so long as an arriving aircraft is no closer than 2 miles from the runway at the time. This separation is determined at the time the departing aircraft commences takeoff roll.
2. Consider the effect surface conditions, such as ice, snow, and other precipitation, may have on known aircraft performance characteristics, and the influence these conditions may have on the pilot's ability to commence takeoff roll in a timely manner.

the Tower Display Workstation (TDW) for determining the distance of the arriving aircraft and visually verifies that the departing aircraft is on its takeoff roll. *Id.*

At 06:39:13, while taxiing on TWY Bravo, SWA708 acknowledged the clearance and advanced engines from about 37° Throttle Resolver Angle (TRA) to 46° TRA for about 10 seconds. FDR and ADS-B Study, Aircraft Performance Study, page 6. At that time, SWA708 was 400 feet from the RWY 18L threshold and just short of the RWY 18L Hold Short Line. FDX1432 was 3.3 miles from the runway threshold, traveling at 126 kts groundspeed, and was 1 minute 15 seconds from crossing the RWY 18L threshold. *Id.*

At 06:39:29, FDX1432, now 2.6 miles and 59 seconds from the threshold of RWY 18L, questioned whether they were cleared to land on runway 18L. *Id.* at page 8. According to the FDX1432 CAPT, he asked for confirmation because he “was concerned about the Southwest traffic on runway 18L.” *Id.* At 0639:34 the controller confirmed that FDX1432 was cleared to land and advised them of traffic (SWA708) departing runway 18L ahead of him. *Id.* at page 18. At this time, SWA708 had just reached RWY 18L. *Id.* at page 8.

At 06:39:44, FDX1432 was two miles from the runway threshold and SWA708 was entering RWY 18L. *Id.* FDX1432 was at an altitude of 880 ft and a groundspeed of 133 kts. *Id.*

At this point, the takeoff clearance for SWA708 (and landing clearance for FDX1432) was in violation of FAA Order JO7110.65Z 5-8-4, which requires that an arriving aircraft be a minimum of 2 miles from the runway when the departing aircraft commences its takeoff roll. The LCE controller was unable to determine the position of SWA708 due to the fog layer. The LCE controller did not attempt to verify the position of SWA708 and did not have any airport surface surveillance equipment available to assist in determining the position of SWA708. At a minimum, at this point the landing clearance for FDX1432 should have been cancelled and FDX1432 should have been instructed to perform a go-around/missed approach.⁹

⁹ The OS on duty stated that she “would not have attempted to launch a departure in that spacing especially not knowing exactly where the departure was” and that the LCE controller using the ‘two increasing to three’ rule for the incident scenario “didn’t meet [her] expectation at all.” ATC Group Chair’s Factual Report, Attachment 5 – Interview Summaries, Page 167 (Susan Green). Further, she stated that “for local, you need two increasing to three, however, that, in my opinion, is really a bare minimum. You need that departure rolling when that arrival hits two miles at the latest, It’s not --- there’s no room. If he’s not – if he doesn’t say we’re departure roll, to me, the way that I would work it, that arrival is going around.” *Id.* Further, she stated, “[I]n this situation, I never would’ve rolled that departure.” *Id.* at 175. The OS stated that her “personal cutoff” for separation of arriving and departing like-type aircraft is that the arriving aircraft must be on a minimum 4-mile final, and then look at other factors such as what type of aircraft are involved. *Id.* at page 176-77.

The AUS ATCT Air Traffic Manager stated:

I guess when it comes to this specific incident though ...when I watch that replay, I cannot for the life of me understand how [the LCE controller] thought that was going to work.

And it doesn't appear to me to be -- I mean, I guess it could be a misunderstanding of just -- just knowing that in a low visibility environment like that, that guys aren't going to taxi fast. Nobody is going to take it on the roll. But I mean, honestly, even if somebody was going to take it on the roll, that's a situation that I'm not sure I would try that given the fact there's nobody behind FedEx. Even if it's good VFR outside, I'm not sure I would do that.

SWA708 continued taxiing and proceeded to taxi onto RWY 18L without delay, lined up with the runway centerline and came to a complete stop at 0639:55. *Id.* at page 9. FDX1432 was then 33 seconds from the RWY 18L threshold and 8,000 ft from SWA708. *Id.*

Once SWA708 was stopped on RWY 18L, the control of the aircraft was transferred from the Captain (CAPT) to the FO, who was the Pilot Flying (PF) for the flight to Cancún, all in accordance with Southwest's procedures. Operational Factors, Attachment 2, SWA Pilot Interviews and Transcripts, page 15 (Capt. David Elliott). In accordance with Southwest's procedures, the SWA708 FO then advanced the power to approximately 70% N1 for roughly 10 seconds,¹⁰ checked the engine parameters, and then released the brakes to begin their takeoff roll at approximately 0640:12.¹¹ *Id.*

At approximately that same time, with FDX1432 on an approximate 0.7-mile final, the local controller queried SWA708 to confirm they were on the takeoff roll, to which the SWA708 CAPT replied "rolling now." FDR and ADS-B Study, Aircraft Performance Study, page 8. According to FAA Order JO711.65Z, Section 5-8-4, at this time FDX1432 needed to be at least 2 miles from the threshold in order to have the minimum separation required for an IFR departure. Instead, FDX1432 was 3,400 ft from SWA708, at an altitude of 270 ft AGL, traveling at 140 kts groundspeed, and 14 seconds from the RWY 18L threshold. *Id.*

The FDX1432 crew reported seeing the shape of SWA708 on the runway as they descended through the fog. *Id.* at page 10.

FDX1432 crossed the threshold to RWY 18L at 06:40:28. *Id.* At 06:40:29 at an altitude of about 150' AGL the FDX1432 FO properly called for a go-around after visually seeing SWA708 on the

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In the scenario, yeah, it was just decision-making. And again, in my opinion . . . this was just really poor judgment. I don't know a better way to put it.

ATC Group Chair's Factual Report, Attachment 5 – Interview Summaries, Page 229-30 (Stephen Martin).

¹⁰ The Southwest Airlines B-737 AOM, Section 15.1.14.2 has the following engine run-up procedure when engine anti-ice is used for takeoff:

(NG) When engine anti-ice is required and the OAT is 3°C or below, accomplish a static engine run-up to a minimum of 70 percent N1 and confirm stable engine operation before the start of the takeoff roll. A 30-second run-up is highly recommended whenever possible if airport congestion and runway surface conditions do not allow for an engine run-up, continue the takeoff normally.

Engine anti-ice was required due to the weather report of freezing fog and the OAT being reported as -1° C.

¹¹ According to the Aircraft Performance Addendum, for the 10 departures prior to SWA708, the elapsed time from the LCE controller issuing a takeoff clearance to the aircraft beginning its takeoff roll ranged from 49 seconds to 1 minute and 51 seconds, with the average being 1 minute 18 second. For SWA708, the elapsed time from clearance to takeoff roll was 1 minute 20 seconds.

runway approximately 1,000 ft to 1,500 ft from the approach end of RWY 18L. *Id.* at page 10-11. The FDX1432 executed the go-around in accordance with all FedEx procedures. *See* Operational Factors, Group Chair's Factual Report, pages 22-36.

At approximately 0640:31 the FDX1432 FO transmitted "Southwest abort." FDR and ADS-B Study, Aircraft Performance Study, page 11. FDX1432 reached a minimum altitude of 31 ft at a point 750 ft down RWY 18L when SWA708's groundspeed was 78 kts and it was 1,350 ft along RWY 18L. *Id.* The horizontal separation was 480 ft and FDX1432 was lower than the top of SWA708's tail. *Id.* at page 12. The SWA708 CAPT does not recall hearing the "Southwest abort" radio call from FDX1432. Operational Factors, Attachment 2, SWA Pilot Interviews and Transcripts, page 15 (Capt. David Elliott). The SWA708 FO heard the "Southwest abort" call but since they did not know who made the call, there was nothing abnormal with the aircraft that would require an aborted takeoff, they were approaching V1, the tower controller had not cancelled their takeoff clearance, and the Captain did not initiate a rejected takeoff,¹² the FO continued the takeoff roll. Operational Factors, Attachment 2, SWA Pilot Interviews and Transcripts, page 15-16 (Capt. David Elliott); Operational Factors, Attachment 2, SWA Pilot Interviews and Transcripts, pages 14-15 (First Officer Michael Brock).

At 0640:37, FDX1432 transmitted "FedEx is on the go." FDR and ADS-B Study, Aircraft Performance Study, page 12. FDX1432 was then 1,320 ft down runway 18L and climbing through 85 ft. SWA708 was 1,700 ft along the runway at a groundspeed of 88 kts and an indicated airspeed of 96 kts. *Id.*

The SWA708 crew stated they heard the FDX1432 call for a go-around during their takeoff roll somewhere between the speeds of 80 KIAS and V1. Operational Factors, Attachment 2, SWA Pilot Interviews and Transcripts, page 15 (Capt. David Elliott). Operational Factors, Attachment 2, SWA Pilot Interviews and Transcripts, pages 14-15 (First Officer Michael Brock).

At 06:40:37 the airplanes reached their point of minimum separation for the event. FDR and ADS-B Study, Aircraft Performance Study, page 12. FDX1432 was 2,020 ft down the runway and climbing through 190 ft. *Id.* SWA708 was 2,200 ft down the runway at a groundspeed of 100 kts and an indicated airspeed of 107 kts. *Id.* FDX1432 was climbing at a rate of 2,000 fpm. *Id.*

By 06:40:46, FDX1432's landing gear were up and stowed. *Id.* at page 13. At 06:40:47, SWA708 rotated at an indicated airspeed of 142 kts. *Id.*

At 06:40:44, the local controller instructed SWA708 to turn right when able and the crew responded "negative." *Id.* The SWA708 CAPT believes that LCE controller thought that they had aborted their takeoff and was instructing the crew to turn right off of RWY 18L when able. Operational Factors, Attachment 2, SWA Pilot Interviews and Transcripts, page 16 (Capt. David Elliott).

SWA708's main landing gear lifted off at 06:40:50 at 5,000 ft down RWY 18L and FDX1432 was 500 ft above it. FDR and ADS-B Study, Aircraft Performance Study, page 13. SWA708's groundspeed was now 7 kts faster than FDX1432 and increasing. *Id.* at page 13-14.

¹² As per the Southwest Airlines AOM, Section 5.18.7, the Captain has sole responsibility for rejecting a takeoff.

SWA708 received a traffic advisory from its Traffic Alert & Collision Avoidance System (TCAS) Computer at approximately this time. FDR and ADS-B Study, Aircraft Performance Study, page 14. According to the SWA708 CAPT, the TCAS alert showed a target “above and to our right, showing 600 feet.” Operational Factors, Attachment 2, SWA Pilot Interviews and Transcripts, page 16 (Capt. David Elliott); Operational Factors, Attachment 2, SWA Pilot Interviews and Transcripts, page 15 (First Officer Michael Brock). In response to the TCAS alert the SWA708 FO “shallowed” his climb to mitigate any risk of a mid-air collision. FDR and ADS-B Study, Aircraft Performance Study, page 14; Operational Factors, Attachment 2, SWA Pilot Interviews and Transcripts, page 16-17 (Capt. David Elliott); Operational Factors, Attachment 2, SWA Pilot Interviews and Transcripts, page 15 (First Officer Michael Brock).

By 06:40:55, SWA708 was also turning slightly to the right of centerline. FDR and ADS-B Study, Aircraft Performance Study, page 14. It was 6,300 ft down the runway at an altitude of approximately 100 ft AGL. *Id.* FDX1432 was 6,200 ft down the runway at an altitude of 750 ft. FDR and ADS-B Study, Aircraft Performance Study, page 14. Horizontal separation was 600 ft and vertical separation was 600 ft. *Id.*

At 06:41:07, at an altitude of 1,420 ft AGL, FDX1432 crossed the threshold of RWY 36R. *Id.* The airplane was climbing at a rate of 3,400 fpm. SWA708, then at an altitude of 370 ft AGL, was 500 ft past the RWY 36 threshold and 300 ft to the right of runway centerline. *Id.*

FDX1432 completed a left turn, circled, and landed on runway 18L at 06:52. SWA708 completed its scheduled flight to Cancún, Mexico. *Id.* at page 15.

The crew of FDX1432 was properly certified and was in compliance with all applicable Federal Aviation Regulations and all Federal Express manuals, policies, procedures and guidelines. *See generally* Operational Factors, Group Chair’s Factual Report.

The crew of SWA708 was properly certified and was in compliance with all applicable Federal Aviation Regulations and all Southwest Airlines manuals, policies, procedures and guidelines. *See generally* Operational Factors, Group Chair’s Factual Report.

II. Proposed Probable Cause

The probable cause of the incident was the failure of the AUS local tower controller to recognize and react to the lack of required separation between FDX1432 and SWA708. Contributing factors of the incident were (1) the inability of the AUS local controller to see TWY Bravo and RWY 18L due to the low-level fog layer, and (2) the lack of ADS-B Airport Surface Surveillance Capability (ASSC) or Airport Surface Detection Equipment, Model X (ASDE-X) at the AUS ATCT.

III. Proposed Safety Recommendations

Recommendations for the FAA

1. Install ADS-B Airport Surface Surveillance Capability (ASSC) or Airport Surface Detection Equipment, Model X (ASDE-X) at the AUS ATCT.
2. Re-evaluate the staffing requirements for AUS ATCT staffing and ensure proper staffing at AUS ATCT.
3. Review all AUS ATCT facility training policies and requirements and ensure that all ATCT personnel have successfully completed all required training.
4. Re-evaluate existing IFR/Radar Departure and Arrival separation requirements, policies and guidance to ensure minimum safe separation of arriving and departing aircraft in low visibility operations, including at facilities that lack airport surface detection capabilities.

Recommendations for the NTSB

1. When applicable, allow operator/air carrier and pilot union representatives that have party status to participate in the Air Traffic Control Group.