

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



DCA25LA163

OPERATIONAL FACTORS/HUMAN PERFORMANCE

Group Chairs' Factual Report

May 5, 2025

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A. INCIDENT

Location: Orlando, Florida
Date: March 20, 2025
Time: 0930 eastern daylight time (EDT)¹
1330 universal time coordinate (UTC)
Airplane: N8315C; Boeing 737-8H4; Southwest flight 3278 (SWA3278)

B. OPERATIONAL FACTORS/HUMAN PERFORMANCE GROUP

Group Chair	Shawn Etcher National Transportation Safety Board Washington, D.C.
Group Chair	Katherine Wilson National Transportation Safety Board (ATC) Washington, D.C.
Group Member	Heidi Kemner Federal Aviation Administration (FAA) AVP-100 Washington, D.C.
Group Member	John Rummel Southwest Airlines (SWA) Dallas, TX
Group Member	Chris Shaver Southwest Airlines Pilots Association (SWAPA) Dallas, TX

C. SUMMARY

On March 20, 2025, about 0930 eastern daylight time (EDT), Southwest Airlines (SWA) flight 3278, a Boeing 737-8H4, N8315C, taxied onto and attempted to depart from taxiway "H" at Orlando International Airport (MCO), Orlando, Florida. The airplane discontinued its takeoff roll and subsequently returned to the gate area. The flight was operated under Title 14 *Code of Federal Regulations* Part 121 as a scheduled domestic passenger flight to Albany International Airport (ALB), Albany,

¹ All times in this report will be in local (EDT) time. At the time of the incident local time was UTC-4 hours.

New York. All 158 occupants (2 flight crewmembers, 4 cabin crewmembers, and 152² passengers) deplaned at the gate without any injuries.

According to air traffic control (ATC) recordings, SWA 3278 was cleared for departure on runway 17R at taxiway "Hotel 2"; however, ADS-B data indicated that the airplane taxied from the ramp on taxiway "H2" crossed taxiway "G," turned right on taxiway "H," and began the takeoff roll. The air traffic control tower (ATCT) then instructed the flight by transmitting "*southwest 3278 stop, southwest 3278 stop, stop stop southwest 3278 stop cancel takeoff clearance you're on hotel taxiway southwest 3278.*" The crew conducted a rejected takeoff, acknowledged the canceled takeoff clearance and turned right off of taxiway "H" onto taxiway "H3."

D. DETAILS OF THE INVESTIGATION

1.0 Specialist Activities

On March 20, 2025, the operational factors and human performance specialists were assigned. The specialists requested crew statements, crew records, flight release information, ACARS data from the event flight, and Southwest Airlines procedures for verifying the runway prior to departure.

On April 2, 2025, after reviewing pilot statements determination was made by the Operational Factors and Human Performance group chairmen to interview the crew.

On April 3, 2025, the Operational Factors/Human Performance combined group was formed with party members from the FAA, SWA, and SWAPA.

On April 17, 2025, the human performance specialist traveled to MCO and took photographs of the taxiway and runway markings.

On April 22, 2025, the group convened at the SWA headquarters in Dallas, Texas to interview the event crew.

2.0 History of Flight

The following information was obtained from ACARS³, SWA provided information, FAA information, Flight Data Recorder, and ADS-B Exchange⁴.

About 0831, the airplane and flightcrew arrived at MCO from Hartsfield-Jackson Atlanta International Airport (ATL), Atlanta, Georgia, and parked at gate 103.

² According to the SWA Weight and Balance Report there were 147 passengers and 5 children.

³ Aircraft Communications Addressing and Reporting System

⁴ [ADS-B Exchange - track aircraft live](#)

According to an ACARS message, about 0917, the L1 door was closed and at 0922 an "out gate message" was sent. The event flight began pushback from gate 103. According to the first officer, they had started both engines during the pushback.

About 0925, the first officer contacted the ATCT ground control to request taxi clearance and was given "taxi to 17R via the ramp and taxiway H2". Subsequently, the event flight began to taxi on the "Airside 2" ramp.

About 0927, the airplane stopped taxi abeam the taxiway "H1" entrance from the ramp. According to crew statements the flight had stopped in this area due to company aircraft that had pushed back from a gate.

About 0929, the flight crew contacted the ATCT controller as instructed by the ground controller and was issued a clearance for "takeoff on Runway 17R at H2." Subsequently, the N1⁵ for both engines increased to 38.8%. Subsequently, FDR data indicated that both engines N1 increased to at or above 40% for the remainder of the taxi and commencement of the takeoff roll. The event flight entered taxiway "H2" from the "airside 2" ramp area with a recorded ground speed of 9 kts. The event flight taxied on taxiway "H2" crossing taxiway "G". According to the first officer about this time the captain said *"final's clear, I also looked, but I didn't have the most clear view of the final there...I looked on the TCAS and I saw plus 0-2. I paused for a second and I looked up and I noticed that company was landing on 1-7 left...at that moment the captain asked a question, he said hey, did we run the before takeoff checklist...I remembered having pushed the recall button on the glare shield panel...I said yes, we did finish the checklist ...momentarily I was like okay, let me just ensure that we didn't miss anything. So we were still headed straight toward 1-7 Right/Hotel 2 intersection. I momentarily looked up to make sure that the bleed switches, the packs, were in the proper position ..."*⁶

About 0930, the event flight approached taxiway "H" on taxiway "H2," subsequently made a right turn onto taxiway "H," the recorded ground speed was 14 kts, the engine N1 speed increased about 90.6%, and the flight began the takeoff roll. According to the captain's statement *"After taxiing past taxiway G, I mistakenly turned right onto taxiway H, thinking that it was the runway. With the engine spooled from taxi power and before I finished the right turn, I announced that I was setting takeoff thrust and selected TOGA⁷, while advancing the thrust levers."*⁸ According to

⁵ Rotational speed of the low-pressure turbine.

⁶ Source: Operational Factors/Human Performance - Attachment 1 - Flight Crew Interview Transcripts, Written Statements and Erratum" pg. 87 line 8 thru pg. 88 line 12.

⁷ Takeoff/Go-Around. Source: [FAA-H-8083-16B; Chapter 4](#)

⁸ Source: Operational Factors/Human Performance - Attachment 1 - "Flight Crew Interview Transcripts, Written Statemen and Erratum" pg. 67.

the first officer, at that time *"The captain stated that we were "spooled up" (meaning 40% N1), he pushed the TOGA switches, and he then said 'set takeoff thrust'. I felt the aircraft turn to the right and heard the engines spool up. I momentarily looked down, saw the thrust levers moving up, but I didn't wait to verify the thrust. I looked outside the aircraft and realized that we were on a taxiway. I was startled when I saw this and it took a few seconds for me to vocalize 'we are on the taxiway-reject'.⁹"* About the same time as the first officer commanded the "reject," the ATCT controller then instructed *"southwest 3278 stop, southwest 3278 stop, stop stop southwest 3278 stop cancel takeoff clearance you're on hotel taxiway southwest 3278."* According to flight crew statements the flight crew aborted their takeoff and turned right on to taxiway "H3." According to ADS-B data the highest recorded ground speed the flight obtained was 66 knots, the crew stated that the flight's airspeed did not exceed 80 kts, and the flight data recording indicated the maximum speed of 71 kts computed airspeed.

After turning right on to taxiway "H3", the ATCT queried if the crew wanted to taxi back and takeoff. The crew informed the ATCT controller that they would need to return to the gate after the brake cooling time had completed.

About 0931, the flight turned right onto taxiway "G," about six minutes later the flight taxied onto the Airside 2 ramp at taxiway "G1."

About 0948, an ACARS message was received from the flight's dispatcher stating, *"while your brakes are cooling if you have a min can you give me a call so we can talk to mx."*

About 0950, the crew responded, *"RTO¹⁰ going back to gate 108 I contacted mx."*

⁹ Source: Operational Factors/Human Performance - Attachment 1 - *"Flight Crew Interview Transcripts, Written Statement and Erratum"* pg. 148.

¹⁰ Rejected takeoff

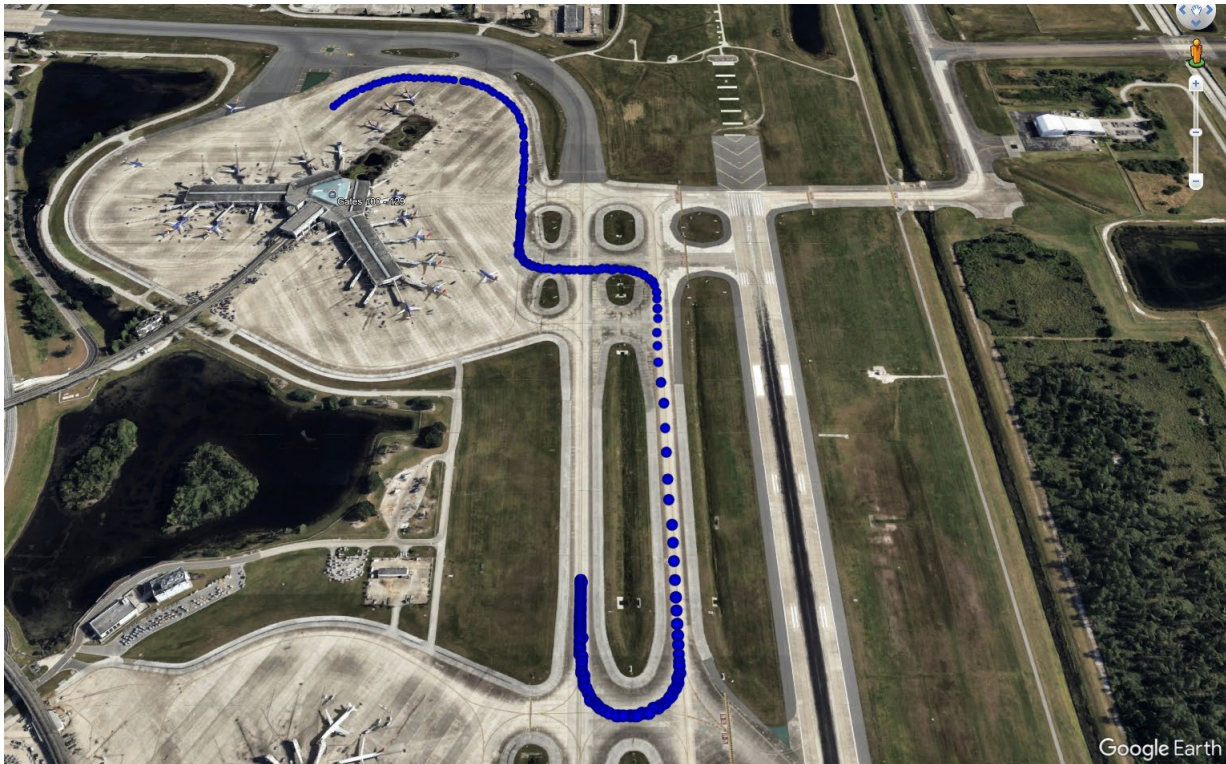


Figure 1: Incident Flight's Taxi and Attempted Takeoff Route

3.0 Flight Crew Information

The crew consisted of a captain, seated in the left seat, and a first officer, seated in the right seat. According to information provided by Southwest Airlines, in the 5 years prior to the event, the captain had operated out of MCO 37 times, the first officer had operated out of MCO 58 times. During the 12 months prior to the event the captain operated out of MCO 2 times and the first officer 6 times. With the most recent time prior to the event the crew operated out of MCO together was on October 1, 2022. At the time of the event both crew members were based out of Hartsfield-Jackson Atlanta International Airport (ATL), Atlanta, Georgia.

3.1 Captain's Information

The captain was 58 years old and held an Airline Transport Pilot (ATP) certificate with a rating for airplane multiengine land, type ratings on the B-737¹¹, BE-

¹¹ The Boeing Company, 737-100, 737-200, 737-200C, 737-300, 737-400, 737-500, 737-600, 737-700, 737-700C, 737-800, 737-900, 737-900ER, 737-8, 737-9. Source: FAA Order 8900.1, Figure 5-88, dated March 29, 2024.

1900¹², and DC-9¹³, commercial pilot privileges airplane single-engine land, which included limitations of B-737, DC-9 Circ. Apch - VMC¹⁴ Only and BE-1900 second in command required. He held a FAA first-class medical certificate dated November 11, 2024, with a limitation of "*must use corrective lens(es) to meet vision standards at all required distances.*" At the time of the incident, he was based at ATL.

3.1.1 Captain's Certification Records

FAA records of the captain indicated the following:

Private Pilot - Airplane Single-Engine Land certificate was on issued July 17, 1990.

Private Pilot - Airplane Single and Multiengine Land certificate was issued on March 17, 1992.

Private Pilot - Airplane Single and Multiengine Land, Instrument Airplane certificate was on issued May 10, 1994.

Commercial Pilot - Airplane Single and Multiengine Land, Instrument Airplane certificate was issued on September 6, 1994.

Flight Instructor - Airplane Single-Engine certificate was issued on March 14, 1995.

Flight Instructor - Airplane Single-Engine, Instrument Airplane certificate was issued on November 22, 1996.

Airline Transport Pilot - Airplane Multiengine Land, BE-1900, Commercial Privileges Airplane Singel-Engine Land; Limitation: BE1900 Second-In-Command required certificate was issued on October 20, 2000.

Airline Transport Pilot - Airplane Multiengine Land, BE-1900, DC-9, Commercial Privileges Airplane Single-Engine Land; Limitations: BE-1900 Second-In-Command Required, DC-9 Circ. Apch - VMC Only certificate was issued on April 24, 2005.

Airline Transport Pilot - Airplane Multiengine Land, B-737, BE-1900, DC-9, Commercial Privileges Airplane Single-Engine Land; Limitations: English Proficient,

¹² Textron Aviation, Inc. 1900, 1900C, 1900D. Source: FAA Order 8900.1, Figure 5-88, dated March 29, 2024.

¹³ The Boeing Company DC-9-11, DC-9-12, DC-9-13, DC-9-14, DC-9-15, DC-9-15F, DC-9-21, DC-9-31, DC-9-32, DC-9-32F, DC-9-33F, DC-9-34, DC-9-34F, DC-9-41, DC-9-51, DC-9-81, DC-9-82, DC-9-82, DC-9-87, MD-88, MD-90-30, 717-200. Source: FAA Order 8900.1, Figure 5-88, dated March 29, 2024.

¹⁴ Circling approach - visual metrological conditions.

B-737 DC-9 Circ. Apch - VMC Only, BE-1900 Second In command Required certificate was issued on December 20, 2014.

3.1.2 Captain’s Certificates and Ratings Held at Time of the Incident

AIRLINE TRANSPORT PILOT (Issued December 20, 2014)

Airplane Multiengine Land
B-737, BE-1900, DC-9
Limitations: Circ Apch - VMC Only
Commercial Pilot Privileges Airplane Single-Engine Land

MEDICAL CERTIFICATE FIRST CLASS (issued November 11, 2024)
Limitations: Must use corrective lens(es) to meet vision standards at all required distances.

3.1.3 Captain’s Flight Hours

The captain’s approximate flight times were based on interview transcripts, Southwest Airlines, and FAA records:

Previous 24 hours ¹⁵	1:30
Previous 7 days ¹⁶	18:35
Previous 30 days ¹⁷	60:54
Previous 90 days ¹⁸	116:12
Total Hours B-737	6,300
Total Flight Experience ¹⁹	20,000

3.1.4 Captain’s Training Record

The captain’s training records were provided by Southwest Airlines and FAA records. An excerpt of the most recent training events is below:

Date of Hire with SWA	November 5, 2014
Initial Type Rating B-737	December 20, 2014
Most recent ground training	January 22, 2025
Upgrade training	February 2, 2016

¹⁵The incident flight was the second flight of the day for the captain; the first flight of the day was with the incident first officer and was from ATL to MCO. The incident flight is **not** included in the total.
¹⁶ The incident flight was **not** included in the total.
¹⁷ The incident flight is **not** included in the total but includes all flights from January 27, 2025.
¹⁸ The incident flight is **not** included in the total but includes all flight from December 24, 2025
¹⁹ Source: FAA Form 8710-1 “Airman Certificate and/or Rating Application” dated March 26, 2024.

Most recent Risk and Resource Management (RRM) ²⁰	January 24, 2025
Most recent line check	November 30, 2024
Most recent Line Oriented Evaluation (LOE)	January 24, 2025

3.1.5 Captain Recent Activities

On Monday, March 17, 2025, the captain was in Detroit, Michigan. He did not recall the time he woke up, but it was "early"²¹. He ate breakfast outside the hotel, exercised, and spent the day in his hotel room. He had a report time of 1705. He flew a leg to Baltimore, deadheaded to Nashville, and then flew to Pensacola, arriving at 2240 CDT²². He thought he went to bed about midnight and had no problems falling asleep or staying asleep.

On Tuesday, March 18, he awoke about 0900 CDT. He had breakfast, exercised and spent the day at the hotel. The van picked him up about 1220 for a 1250 show time. He flew 3 legs that day and ended his duty day in Atlanta, Georgia, at 2220. He spent the evening at his home and went to bed about 0030. He thought he was asleep about 30 minutes after going to bed.

On Wednesday, March 19, he woke up about 0630, spent a bit of time with family that was leaving that morning, and then took a nap for about an hour, he thought from about 1100 until 1200 or maybe earlier. He watched TV and read a bit when he got into bed and thought he was asleep a little past 2000. He did not have any problems falling asleep or staying asleep.

On Thursday, March 20, he awoke at 0330 with an alarm. He felt "fine"²³ the morning of the event. He had a cup of coffee and drove to the airport.

In the 72 hours prior to the event, he did not take any medications, prescription or nonprescription, that might have affected his performance.

3.2 First Officer

The first officer was 53 years old and held an ATP certificate with a rating for airplane multiengine land, type ratings on the B-737, CL-65, and EMB-120, commercial pilot privileges airplane single-engine land, which included limitations of

²⁰ This was part of the captain's line-oriented evaluation. Risk and Resource Management was required by regulations to integrate with technical skill training. SWA incorporates RRM throughout all curriculum for pilots.

²¹ Source: Operational Factors/Human Performance - Attachment 1 - "Flight Crew Interview Transcripts and Written Statements" pg. 48 line 6.

²² Central Daylight Time. At the time of the incident CDT was UTC-5 hours and EDT-1 hour.

²³ Source: Operational Factors/Human Performance - Attachment 1 - "Flight Crew Interview Transcripts and Written Statements" pg. 53 line 18.

B-737, CL-65 Circ. Apch - VMC. He held a FAA first-class medical certificate dated October 16, 2024, 11, 2024, with no limitation. At the time of the incident, he was based at ATL.

3.2.1 First Officer's Certification Record

FAA records of the first officer indicated the following:

Private Pilot - Airplane Single-Engine Land certificate was issued on September 2, 1990.

Private Pilot - Airplane Single-Engine Land, Instrument - Airplane certificate was issued on October 6, 1992.

Commercial Pilot - Airplane Single-Engine Land, Instrument - Airplane certificate was issued on March 19, 1993.

Flight Instructor - Airplane Single-Engine, Instrument - Airplane certificate was issued on August 23, 1993. Reissued on August 22, 1995.

Flight Instructor - Airplane Single and Multiengine, Instrument - Airplane certificate was issued on April 16, 1996. Reissued: April 11, 1998.

Commercial Pilot - Airplane Single and Multiengine Land, Instrument - Airplane certificate was issued on November 15, 1993.

Airline Transport Pilot - Airplane Multiengine Land, EMB-120, Commercial Privileges Airplane Single-Engine Land certificate was issued on March 9, 2000.

Airline Transport Pilot - Airplane Multiengine Land, CL-65, EMB-120; Commercial Privileges Airplane Single-Engine Land; Limitations: CL-65 Circ. Apch - VMC Only certificate was issued on June 27, 2002.

Airlines Transport Pilot - Airplane Multiengine Land, B-737, CL-65, EMB-120; Commercial Pilot Privileges Airplane Single-Engine Land; Limitations: English Proficient, B-737 CL-65 Circ. Apch - VMC Only certificate was issued on March 13, 2018.

3.2.2 First Officer's Certificates and Ratings Held at Time of the Incident

AIRLINE TRANSPORT PILOT (Issued December 20, 2014)

Airplane Multiengine Land
B-737, BE-1900, DC-9

Limitations: Circ Apch – VMC Only
Commercial Pilot Privileges Airplane Single-Engine Land

MEDICAL CERTIFICATE FIRST CLASS (issued November 11, 2024)

Limitations: Must use corrective lens(es) to meet vision standards at all required distances.

3.2.3 First Officer's Flight Hours

Previous 24 hours ²⁴	1:30
Previous 7 days ²⁵	18:44
Previous 30 days ²⁶	18:44
Previous 90 days ²⁷	186:28
Total Hours B-737 ²⁸	4,000
Total Flight Experience ²⁹	12,000

3.2.4 First Officer's Training Record

The first officer's training records were provided by Southwest Airlines and FAA records. An excerpt of the most recent training events is below:

Date of Hire with SWA	January 16, 2018
Initial Type Rating B-737	March 13, 2018
Most recent ground training	June 21, 2024
Basic Indoctrination	February 23, 2018
Most Recent Initial Operating Experience (IOE) ³⁰	March 26, 2018
Most recent Risk and Resource Management (RRM) ³¹	January 21, 2025
Most recent Line Oriented Evaluation	March 16, 2025
Most recent Line Check	March 20, 2018

²⁴ The incident flight was the second flight of the day for the first officer; the first flight of the day was with the incident captain and was from ATL to MCO. The incident flight is **not** included in the total.

²⁵ The total does **not** include the incident flight.

²⁶ The incident flight is **not** included in the total but includes all flights from February 20, 2025, thru the morning of March 20, 2025. Of note the first officer did not operate any flights between February 18, 2025, and March 15, 2025.

²⁷ The incident flight is **not** included in the total but includes all flights from December 20, 2024, thru March 20, 2025.

²⁸ Source: Operational Factors/Human Performance – Attachment 1 – *"Flight Crew Interview Transcripts and Written Statements"* pg. 9 line 6.

²⁹ Source: Operational Factors/Human Performance – Attachment 1 – *"Flight Crew Interview Transcripts and Written Statements"* pg. 9 line 1.

³⁰ IOE consisted of 53:18 of total flight experience as well as 18 takeoff and landings.

³¹ This was part of the first officers OPS Day training. Risk and Resource Management was required by regulations to integrate with technical skill training. SWA incorporates RRM throughout all curriculum for pilots.

3.2.5 First Officer's Recent Activities

On Monday, March 17, 2025, the first officer woke up between 0300 and 0400 PDT³². He flew 2 legs and ended his duty day in Atlanta and got home about 1700-1800. He thought he was asleep by 1900 or 2000. He had no problems falling asleep or staying asleep.

On Tuesday, March 18, he thought he woke up about 0500 with an alarm. He exercised for about an hour, had a cup of tea and then went on a 2-hour walk. He did activities with his family, had dinner and then went to sleep around 2100. He did not recall having any problems falling asleep or staying asleep.

On Wednesday, March 19, he thought he woke up about 0600. He exercised, had a cup of tea, went for a 2-hour walk and prepared his uniform for his trip on Thursday. In preparation for an early duty day, he got in bed about 1830 and was asleep about 1900. He did not recall any problems falling asleep or staying asleep; he might have gotten up one time to use the bathroom but went back to sleep.

On Thursday, March 20, he awoke at 0300 and kept a similar morning routine of exercising and having tea. He left the house about 0455. He brought breakfast with him that he ate throughout the morning. That morning, he felt "*refreshed, ready to go.*"³³

In the 72 hours prior to the event, he did not take any prescription or nonprescription medications that might have affected his performance.

4.0 Airport Information

Orlando International Airport was located in Orlando, Florida³⁴. It was located about 6 miles southeast of the city of Orlando at 28°25.49N by 081°18.32W. The airport elevation was 96.4 ft msl. The airport was owned by the Greater Orlando Aviation Authority. The airport had an FAA air traffic control tower (ATCT) that operated continuously and was in operation at the time of the incident. The airport had four paved airplane landing surfaces. Those were designated 17L/35R, 17R/35L, 18L/36R, and 18R/36L. The intended runway for departure was runway 17R/35L which was 10,000 ft. long and 150 ft. wide.

³² Pacific Daylight Time At the time of the incident PDT was UTC-7 hours and EDT-3 hours.

³³ Source: Operational Factors/Human Performance - Attachment 1 - "*Flight Crew Interview Transcripts and Written Statements*" pg. 137 line 5.

³⁴ Source: [AirportIQ 5010](#)

KMCO/MCO
Apt Elev 96'
N28 25.8 W081 18.5

JEPPESSEN ORLANDO, FLA
28 MAR 25 (20-9) ORLANDO INTL

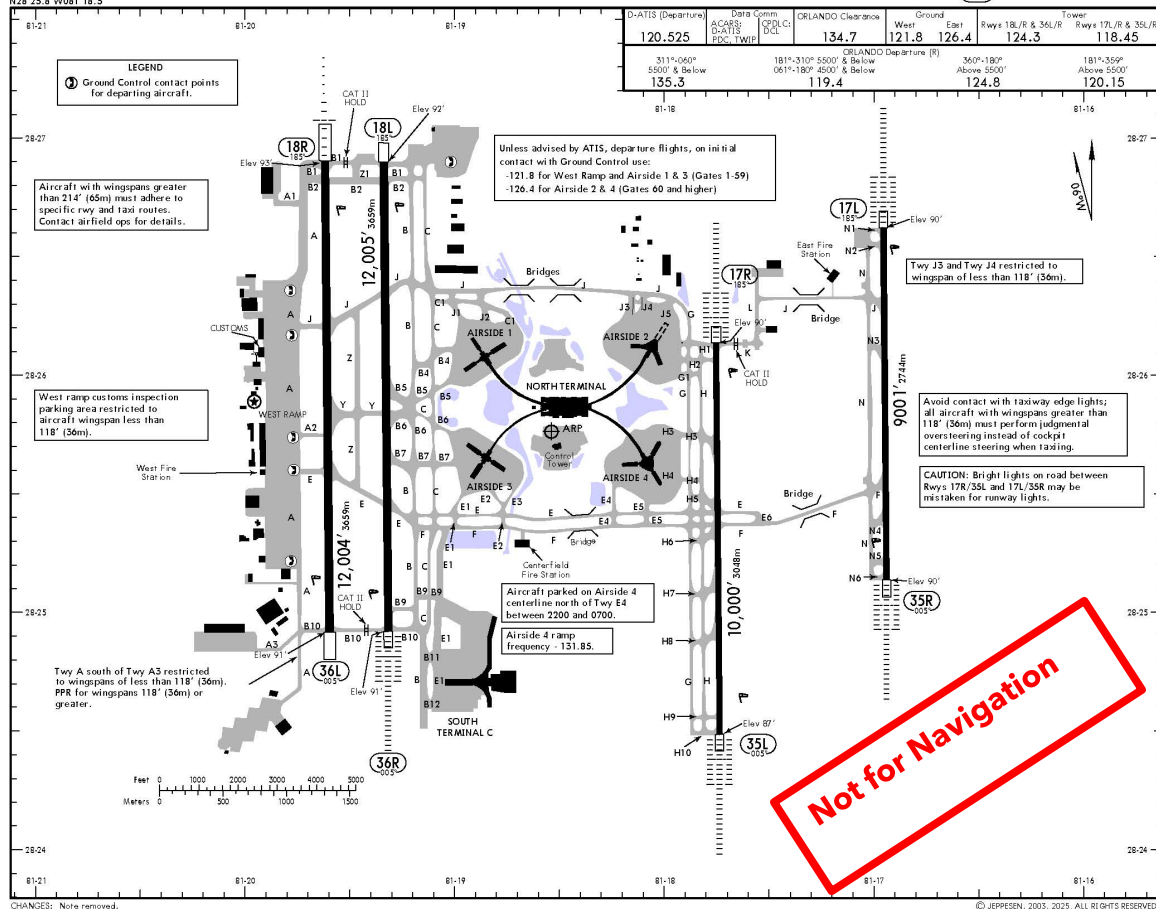
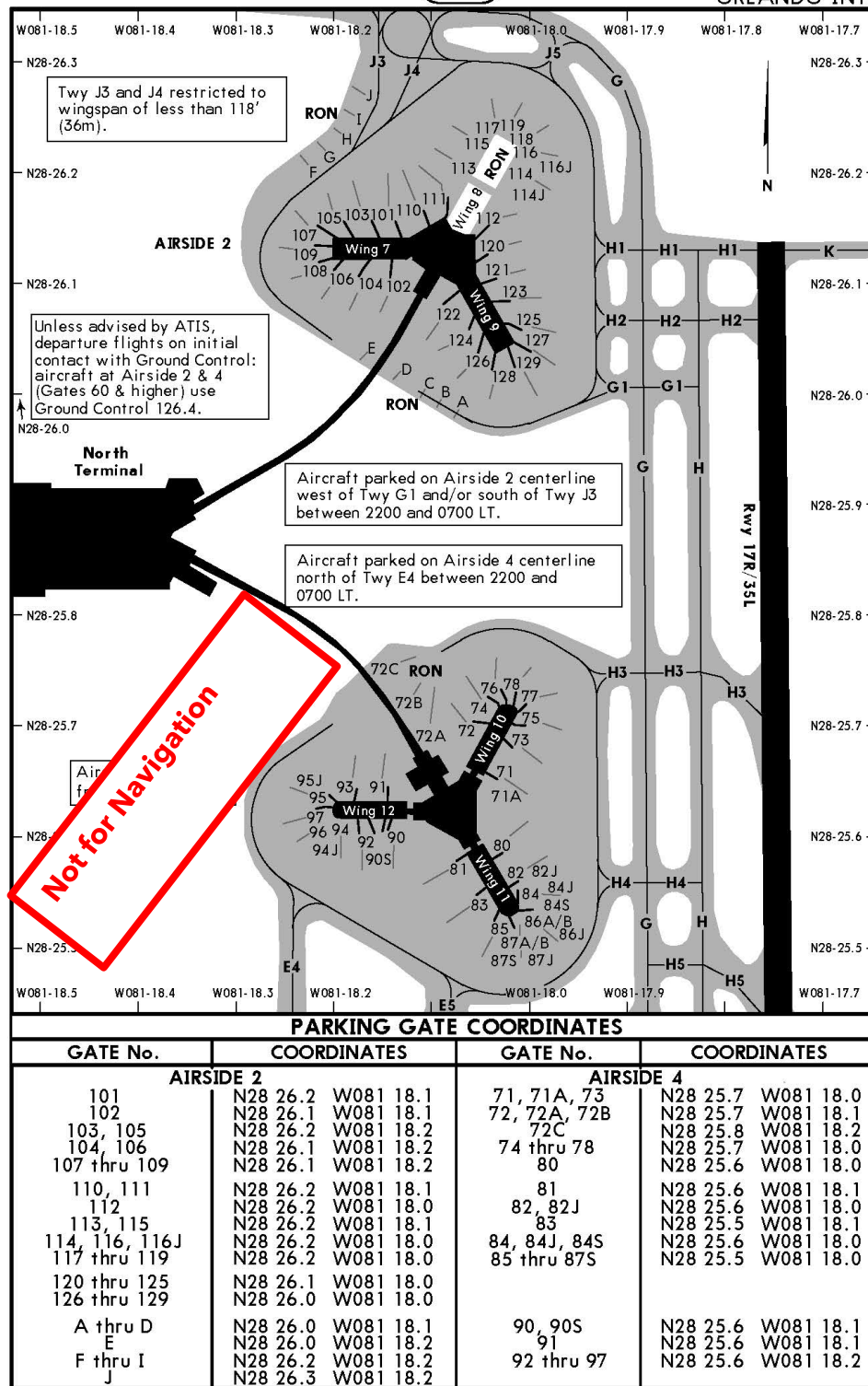


Figure 2: Orlando International Airport Chart (Source: Jeppesen)

KMCO/MCO

JEPPESSEN
2 AUG 24 (20-9C)

ORLANDO, FLA
ORLANDO INTL



CHANGES: Ground control note added.

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Figure 3: Expanded View of Airside 2 and 4 Gates (Source: Jeppesen)

4.1 NOTAMs

According to the FAA, at the time of the event there were 23 NOTAMs³⁵ in effect at MCO. Of those NOTAMs, six were in the vicinity of or along the taxi route for the event flight, those NOTAMs were:

!MCO 02/220 MCO TWY H EDGE MARKINGS BTN TWY H1 AND TWY H2 WEST SIDE NOT STD 2502211833-2503222100
!MCO 03/086 MCO TWY G BTN TWY J5 AND TWY H2 CLSD LGTD AND BARRICADED 2503141319-2503212100
!MCO 03/087 MCO TWY H1 BTN AIRSIDE 2 RAMP AND TWY H CLSD LGTD AND BARRICADED 2503141320-2503212100
!MCO 03/031 MCO RWY 17R/35L RWY STATUS LGT SYSTEM U/S 2503090542-2504112000EST
!MCO 11/084 MCO APRON AIRSIDE 2 RAMP BTN TWY J5 AND TWY H2 EDGE MARKING NOT STD 2411211456-2503312200
!MCO 11/083 MCO APRON AIRSIDE 2 RAMP BTN TWY J5 AND TWY G1 CL MARKING NOT STD 2411211454-2503312100

The NOTAMs in plain English from standard coding:

MCO issued in February and the 220th NOTAM issued that month for MCO taxiway H edge marking between taxiway H1 and taxiway H2 west side not standard. In effect from February 21, 2025, at 1833 UTC until March 22, 2025, at 2100 UTC.

MCO issued in March and the 86th NOTAM issued that month for MCO taxiway G between taxiway J5 and taxiway H2 closed and its lighted and barricaded. In effect from March 14, 2025, at 1319 UTC until March 21, 2025, at 2100 UTC.

MCO issued in March and the 87th NOTAM issued that month for MCO taxiway H1 between Airside 2 ramp and taxiway H closed and its lighted and barricaded. In effect from March 14, 2025, at 1320 UTC until March 21, 2025, at 2100 UTC.

MCO issued in March and the 31st NOTAM issued that month for MCO runway 17R/35L runway status light system³⁶ unserviceable. In effect from March 9, 2024, at 0542 UTC until April 11, 2025, at 2000 UTC estimated.

MCO issued in November and the 84th NOTAM issued that month for MCO the apron for airside 2 ramp between taxiway J5 and taxiway H2 edge marking

³⁵ Notice to Airmen

³⁶ See section 8.2 of this report for information on runway status lights.

were not standard. In effect from November 21, 2024, at 1456 UTC until March 21, 2024, at 2200 UTC.

MCO issued in November and the 83rd NOTAM issued that month for MCO the apron for airside 2 ramp between taxiway J5 and taxiway G1 closed, markings not standard. In effect from November 21, 2024, at 1454 UTC until March 31, 2025, at 2100 UTC.

In addition, there were construction NOTAMs in effect at the time at MCO, the below diagram indicated which taxiways were closed via a red line indication and which taxiways had a restriction in place via the blue line indication.

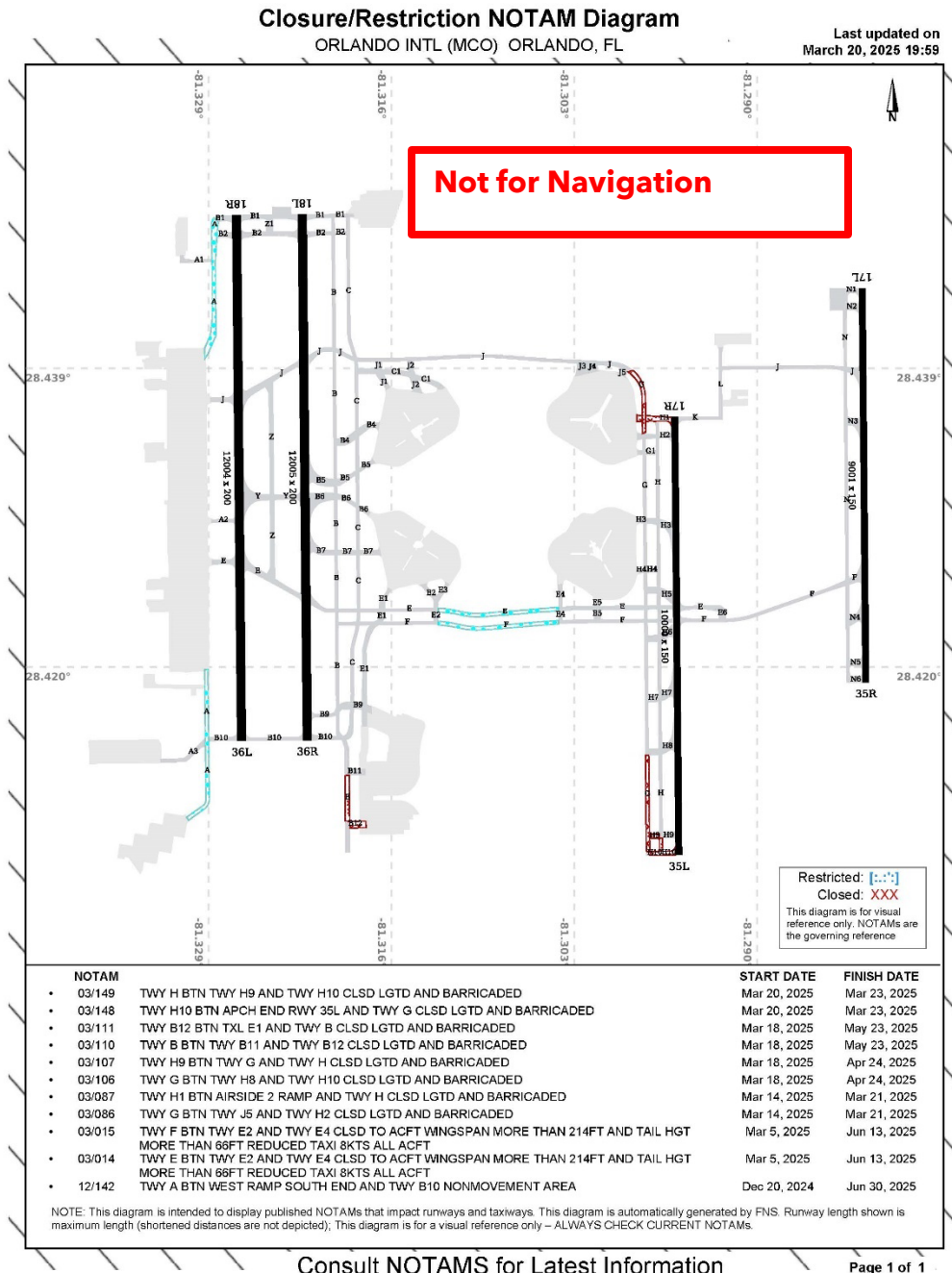


Figure 4: MCO Closure or Restriction NOTAM Diagram

4.1.1 Taxiway Photographs

The following photographs depict the taxiway markings at taxiway H2 and runway 17R/35L.



Figure 5: View towards the East on Taxiway H2 (Source: Human Performance Group Chairman)



Figure 6: View of Hold-short Line and Runway Sign for Runway 17R/35L (Source: Human Performance Group Chairman)



Figure 7: View of Runway 17R/35L Hold-short Line and Taxiway Markings on Taxiway H2 (Source: Human Performance Group Chairman)



Figure 8: Displaced Construction Barricade (Postincident) on Taxiway H. Incident Airplane in Background (Source: Greater Orlando Airport Authority)

5.0 Meteorological Information

The MCO Airport was equipped with an ASOS . The recordings prior to and after the incident are listed below:

SA 20/03/2025 13:53-> METAR KMCO 201353Z 23008KT 10SM FEW015
SCT250 21/08 A3005 RMK AO2 SLP172 FU FEW015 T02060083=
SA 20/03/2025 12:53-> METAR KMCO 201253Z 23006KT 10SM SCT250
16/12 A3003 RMK AO2 SLP166 T01610117=

6.0 Airplane Information

The airplane was manufactured in 2012, was a 737-8H4 series aircraft, serial number 38811, and issued a standard transport category airworthiness certificate on July 13, 2012. The airplane was registered to Southwest Airlines since July 16, 2012. The airplane was powered by two CFM56-7B27E, each capable of producing up to 27,300 lbs. of thrust.

6.1 Weight and Balance

The following information was based on the weight and balance paperwork provided by Southwest Airlines. Airplane limitations are indicated in **bold** type. All the weights below are in pounds (lbs.).

Operating Weight	93,833
Zero Fuel Weight ³⁷	130,503
Maximum Zero Fuel Weight	138,300
Ramp Fuel ³⁸	23,020
Ramp Weight	153,523
Planned Taxi Fuel	400
Takeoff Fuel	22,620
Takeoff Weight	153,123
Maximum Takeoff Weight	174,200
Estimated Enroute Fuel Burn	12,140
Landing Weight ³⁹	140,983
Maximum Landing Weight	146,300
Takeoff Center of Gravity (CG) ⁴⁰	23.8

³⁷ Weight includes 4 flight attendants , 151 passengers (147 adults and 5 children), and 4,718 lbs. of cargo.

³⁸ Source: ACARS message reporting out time from the gate and fuel on board.

³⁹ Source: Operational Factors - Attachment 7 - "Incident Flight ACARS Messages [Excerpts]"

⁴⁰ Takeoff CG range was between 14.2 and 26.8.

7.0 Southwest Airlines Guidance and Procedures

7.1 Captain Briefing

The Southwest Airlines Flight Operations Manual provided the following guidance, in part, as it pertained to the captain's briefing:

The purpose of the Captain Briefing is to review and plan for all phases of flight by developing and establishing an appropriate shared mental model between both Pilots. The captain should review the information pertinent to the flight and other resources for issues that might affect the flight. The Captain should discuss task loading, additive conditions, Crew factors, and the plan to use available resources to manage risk and increase performance...

The Captain Briefing must be completed prior to beginning the Before Start - Originating/Before Start checklist.

...

(CA) Brief the following, as relevant:

...

- **Taxi routing/hotspots/Surface Movement Guidance and Control System (SMGCS)** - Brief the expected taxi routing, applicable hotspots, SMGCS, and any additional considerations depicted on the Jeppesen - 6/-9 (page 10-6/10-9 or equivalent).

7.2 Taxi Operations

The Southwest Airlines Flight Operations Manual provided the following guidance, in part, about taxi operations:

Direct attention outside during taxi, except for momentary flight deck crosschecks.

While the aircraft is moving, the intention is to have both Pilots focused outside.

...

(CA) Taxi the aircraft smoothly with minimum power.

Release the parking brake. Smoothly increase the thrust to the minimum required for the aircraft to roll forward, then reduce the thrust.

Nose wheel and rudder pedal steering are used for maneuvering the aircraft. Rudder pedal steering may be used while taxiing where small directional changes are required. Make all turns at a slow taxi speed. During taxi operations, Pilots must maintain continuous awareness of proximity to obstacles and the potential dangers of the aircraft jet blast pattern...

(CA) Do not exceed operational taxi speeds.

Normal taxi speed is 20 kt or less ground speed. Do not exceed 30 kt ground speed on straight taxiways. Adjust to a slower taxi speed for adverse ramp and taxiway conditions....

Maintain adequate lateral clearance from other aircraft and stationary objects.

When the aircraft is not on a taxi line, a lateral clearance of 10 ft is considered minimum acceptable separation. Never allow any portion of the aircraft to overlap another aircraft or ground equipment. The only exception is stationary equipment in a properly marked area of the safety zone,

Caution: Lateral clearance, particularly to the top of the winglet, is difficult to judge. Aircraft geometry causes an outboard motion of the winglets (for non-winglet aircraft, the horizontal stabilizer) during turns.

If lateral clearance is in question:

- Stop the aircraft.
- Request a wing walker.
- Request a tug or wait for the other aircraft to move.

7.3 Managing Intensive Tasks During Taxi

The Southwest Airlines Aircraft Operating Manual provided the following guidance, in part, as it pertained to managing tasks during taxi:

The Captain manages taxi situations by controlling when and where head-down tasks are performed. The intent is to allow the First officer to divert the First Officer's attention to the flight deck when conditions permit to accommodate operational changes. While the First Officer is occupied with flight deck tasks, the Captain must balance workload and be prepared to stop the aircraft if it becomes necessary...

7.4 Before Takeoff Checklist

The Southwest Airlines B737 Normal Checklist was broken down into ten sections. Those sections were to be accomplished at various stages and were labeled as such. One of the sections was titled "Before Takeoff". That section included the items that were required to be accomplished prior to the initiation of takeoff power, that section is below:

BEFORE TAKEOFF	
Min Takeoff Fuel	Verified
Departure Plan	Not Req'd/Complete
Attendant Notification	Complete
Electrical	Generators ON
Anti-Ice	As Required
Packs	As Required
Bleeds	As Required
Start Switches	Left, CONT
APU	As Required
Flaps..... CDU ____ Indicates ____	Green Light
Start Levers	IDLE
Recall	Checked

7.5 Taxiing Onto the Departure Runway

The Southwest Airlines Aircraft Operations Manual provided, in part, the following guidance to flightcrews when taxiing onto a runway for departure:

The Pilot(s) with an unobstructed view of the approach path will clear final and call, "Final is clear."

Final is considered "clear" even with known aircraft on extended final as long as they are not a conflict for the takeoff. Verbally acknowledge the presence of these aircraft that might pose a conflict while taking the runway.

Treat the runway environment as a critical zone. When entering the departure runway, direct your attention outside. Do not perform flight deck tasks, except for momentary items such as turning on exterior lighting.

Monitor the movement of aircraft and vehicles in the runway environment. Ensure the departure runway, intersecting runways and taxiways, and departure flight path remain clear for takeoff. Be vigilant for aircraft and vehicles crossing without clearance...

When entering the departure runway either for takeoff or to "Line Up and Wait," turn on all exterior lights except landing lights...

Both Pilots crosscheck all available references and confirm that the aircraft's location is in agreement with the assigned departure runway.

Use all available references to confirm that the aircraft is at the assigned departure runway. The references may include:

- *Aircraft heading indicators (including HGS)*

- Navigation display
- Runway signage
- Painted runway designation (may not be visible for displaced thresholds or intersection takeoffs)
- Jeppsen -9 page
- Runway lighting (expected lighting versus actual lighting)

Verify the aircraft is on the assigned runway for takeoff using all available references.

(CA) Verbally verify the aircraft is on the assigned runway.

Verify that the aircraft is on the assigned runway and state, **"Runway _____, Verified."**

Warning: If there is any doubt that the aircraft is on the correct runway, do not takeoff and notify ATC immediately...

8.0 FAA Guidance

8.1 Complex Airfield Geometry

The FAA produced guidance about "Complex Airfield Geometry"⁴¹ in which they identified "seven airfield geometry configurations that most frequently lead to pilot challenges resulting in runway incursion." Although the publication was about runway incursions it should be noted that some of the identified geometry configurations could pertain to a wrong surface departure attempt. Of the seven identified configurations, there were two that were similar to the event taxi, those were "direct access to runway from ramp areas," and "short taxi distance from ramp or apron to runway."

8.2 Runway Status Lights

At the time of the incident the runway 17R/35L runway status lights were NOTAM'd out of service (see section 4.1 of this report). According to a description provided by the FAA "Runway Status Lights is an essential FAA system which uses Airport Surface Detection Equipment, Model X surveillance data to determine vehicle and aircraft locations. Runway Status Lights processes this data using complex software algorithms with adjustable parameters to control airfield lights in accordance with Air Traffic operations, including anticipated separation. Red airfield lights (Runway Entrance Lights and Takeoff Hold Lights) illuminate and extinguish as vehicles and aircraft traverse the airfield.

System

⁴¹ Source: [Complex Airfield Geometry | Federal Aviation Administration](#)

- *Runway Status Lights integrates airport lighting equipment with approach and surface surveillance systems to provide a visual signal to pilots and vehicle operators indicating that it is unsafe to enter/cross or begin takeoff on runway. The system is fully automated based on inputs from surface and terminal surveillance systems. Airport surveillance sensor inputs are processed through light control logic that commands in-pavement lights to illuminate red when there is traffic on or approaching the runway.*
- **Runway Entrance Lights (RELs)** provide signals to aircraft crossing entering runway from intersecting taxiway
- **Takeoff Hold Lights (THLs)** provide signal to aircraft in position for takeoff⁴²

8.2.1 Runway Entrance Lights

Guidance provided by the FAA regarding RELs stated, in part, the following⁴³:

Runway Entrance Light are a string of lights located around the center of taxiways/runway crossings and illuminate red when there is high-speed traffic on or approaching the runway to signal that it is unsafe to enter the runway.

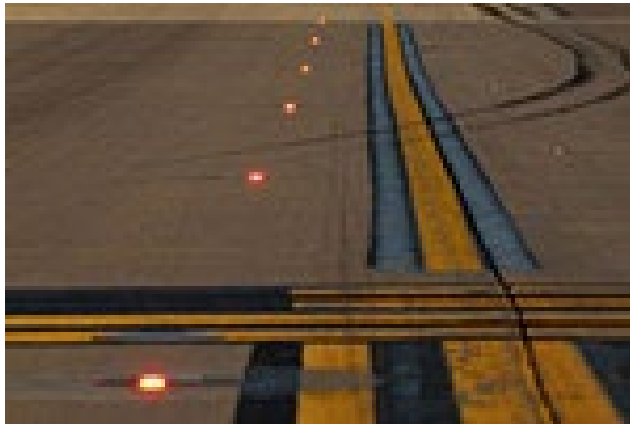


Figure 9: Runway Entrance Lights⁴⁴

8.2.2 Takeoff Hold Lights

Guidance provided by the FAA regarding THLs stated, in part, the following:

Takeoff Hold Lights are located in the center of the runway at [the] takeoff hold point. They are laid out as 16 double rows of lights, for a total of 32 lights making up

⁴² Source: https://www.faa.gov/air_traffic/technology/rwsl/description/

⁴³ . Source https://www.faa.gov/air_traffic/technology/rwsl/faqs/

⁴⁴ Source: https://www.faa.gov/air_traffic/technology/rwsl/gallery/

each Takeoff Hold Lights group. The lights will illuminate red when there is an aircraft in position for departure and the runway is occupied by another aircraft or vehicle.



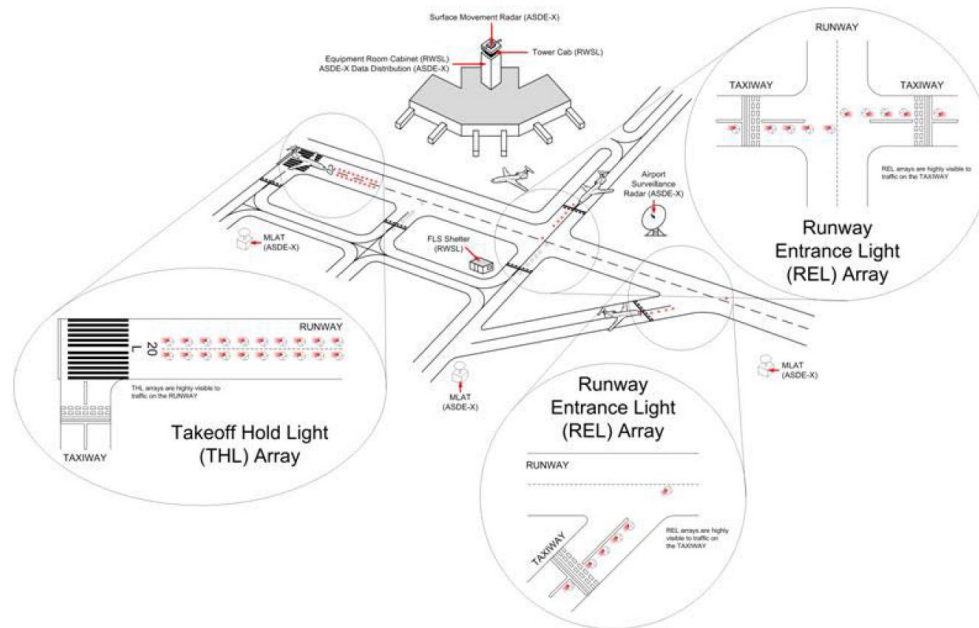
Figure 10: Threshold Hold Lights⁴⁵

8.2.3 FAA Pilot Reference Guide⁴⁶

Runway Status Lights is a fully automated system that provides runway status information to pilots and surface vehicle operators to indicate when it is unsafe to enter, cross, or takeoff from a runway. The Runway Status Lights system processes information from surveillance systems and activates Runway Entrance Lights and Takeoff Hold Lights in accordance with the motion and velocity of the detected traffic. Runway Entrance Lights and Takeoff Hold Lights are in-pavement light fixtures that are directly visible to pilots and surface vehicle operators. Runway Status Lights is an independent safety enhancement that does not substitute for an Air Traffic Control clearance. Clearance to enter, cross, or takeoff from a runway must still be issued by Air Traffic Control. Although Air Traffic Control has limited control over the system, personnel do not directly use, and may not be able to view, light fixture output in their operations.

⁴⁵ Source: https://www.faa.gov/air_traffic/technology/rwsl/gallery/

⁴⁶ Source: https://www.faa.gov/air_traffic/technology/rwsl/pet/



The Runway Status Light System

Figure 11: Runway Status Light System (Source: FAA)

Runway Entrance Lights: The Runway Entrance Lights system is composed of flush mounted, in-pavement, unidirectional fixtures that are parallel to and focused along the taxiway centerline and directed toward the pilot at the hold line. A specific array of RELs will include the first light at the hold line followed by a series of evenly spaced lights to the runway edge; and one additional light at the runway centerline in line with the last two lights before the runway edge. When activated, these red lights indicate that there is high speed traffic on the runway or there is an aircraft on final approach within the activation area.

1. Operating Characteristics - Departing Aircraft:

When a departing aircraft reaches 30 knots, all taxiway intersections with Runway Entrance Lights arrays along the runway ahead of the aircraft will illuminate. As the aircraft approaches a Runway Entrance Lights equipped taxiway intersection, the lights at that intersection extinguish approximately 2 to 3 seconds before the aircraft reaches it. This allows controllers to apply "anticipated separation" to permit Air Traffic Control to move traffic more expeditiously without compromising safety. After the aircraft is declared "airborne" by the system, all lights will extinguish.

2. Operating Characteristics - Arriving Aircraft:

When an aircraft on final approach is approximately 1 mile from the runway threshold all sets of Runway Entrance Light arrays along the runway will illuminate. The distance is adjustable and can be configured for specific operations at particular

airports. Lights extinguish at each equipped taxiway intersection approximately 2 to 3 seconds before the aircraft reaches it to apply anticipated separation until the aircraft has slowed to approximately 80 knots (site adjustable parameter). Below 80 knots, all arrays that are not within 30 seconds of the aircraft's forward path are extinguished. Once the arriving aircraft slows to approximately 34 knots (site adjustable parameter), it is declared to be in a taxi state, and all lights extinguish.

3. What a pilot would observe:

A pilot at or approaching the hold line to a runway will observe Runway Entrance Lights illuminating and extinguishing in reaction to an aircraft or vehicle operating on the runway, or an arriving aircraft operating less than 1 mile from the runway threshold. Whenever a pilot observes the red lights of the Runway Entrance Lights, that pilot will stop at the hold line, or along the taxiway path and remain stopped. The pilot will then contact Air Traffic Control for resolution if the clearance is in conflict with the lights. Should pilots note illuminated lights under circumstances when remaining clear of the runway is impractical for safety reasons (i.e., aircraft is already on the runway), the crew should proceed according to their best judgment while understanding the illuminated lights indicate the runway is unsafe to enter or cross.

Pilot Actions:

1. When operating at airports with Runway Status Lights, pilots should turn the transponder "ON" with Altitude Enabled when operating on all taxiways and runways. This ensures interaction with the FAA surveillance systems which provide information to the Runway Status Lights system.

2. Never cross over illuminated red lights. Under normal circumstances, Runway Status Lights will confirm the pilot's taxi or takeoff clearance. If Runway Status Lights indicate that it is unsafe to takeoff from or taxi across a runway, immediately notify Air Traffic Control of the conflict and confirm your clearance.

4[sic]. Do not proceed when lights have extinguished without an Air Traffic Control clearance. Runway Status Lights verifies an Air Traffic Control clearance; it does not substitute for an Air Traffic Control clearance.

8.3 AC150/5340-1M

FAA AC 150/5340-1M⁴⁷, "Standards for Airport Markings," dated December 23, 2020, provided, in part, the following information and safety notices.

⁴⁷ [Consolidated Change 1 to AC 150/5340-1M, Standards for Airport Markings, 12/23/2020](#)

8.3.1 Mitigation of Wrong Runway Takeoffs

Safety Notice No. 10

Mitigation of Wrong Runway Takeoffs

Precaution should be taken not to paint a non-movement area boundary marking on the outer edges of an apron that is transitioning into a taxiway that leads directly to a runway. Under certain runway/taxiway geometries, such as shown in Figure 5-1, placement of this surface marking where dual parallel taxiways support a runway have resulted in pilots taking off on a parallel taxiway. The concern of such usage is that pilots who expect a nearby runway holding position marking after leaving an apron will confuse these two markings because of their visual similarities, i.e., single dash/single line versus dual dashes/dual lines. It is recommended that the non-movement boundary marking not be located on or just prior to a taxiway that leads directly to a runway.

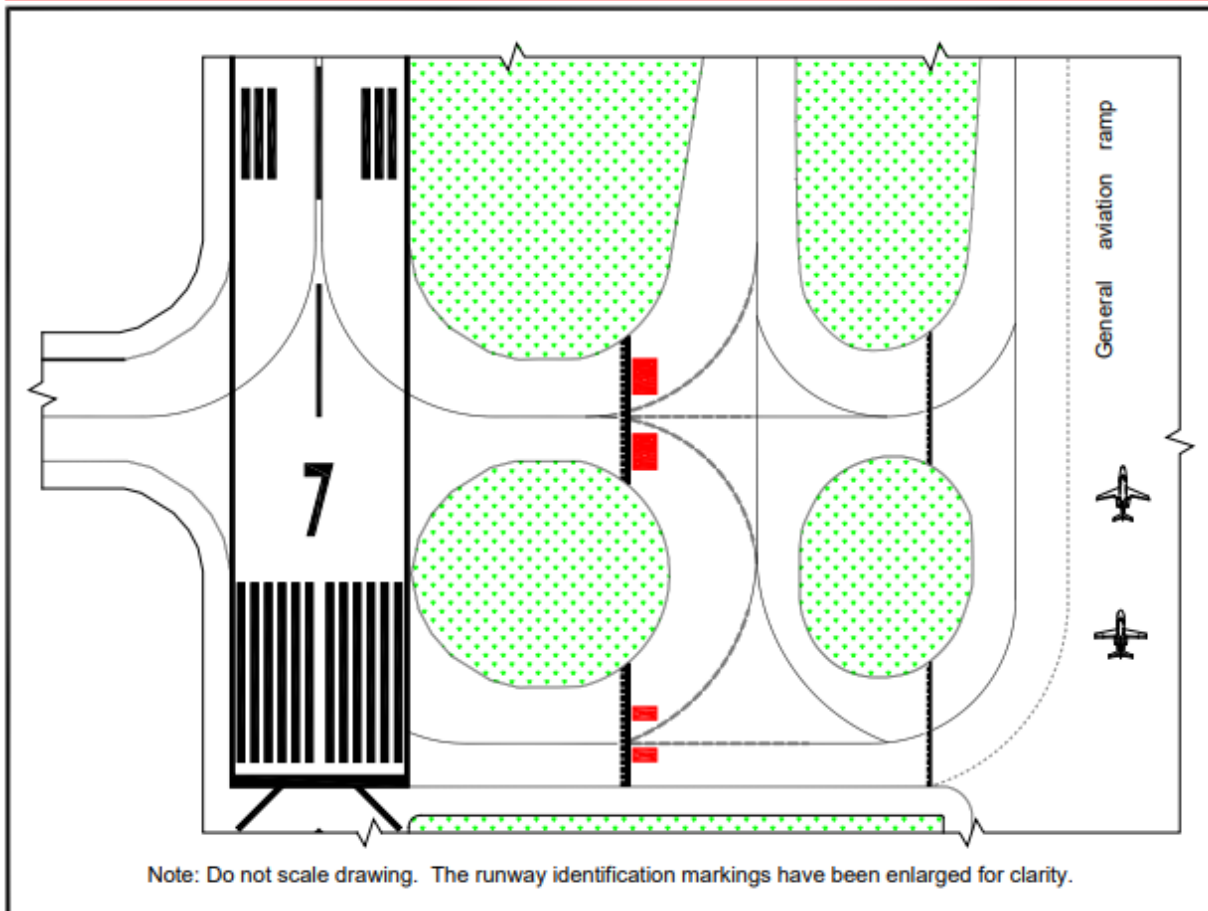


Figure 12: Surface Marking Depiction for Parallel Taxiways (Source: FAA)

Note: The location of movement area markings at these locations may cause pilots errors. For example, to mistake this marking for a runway holding position marking (Pattern A), resulting in a takeoff from the parallel taxiway

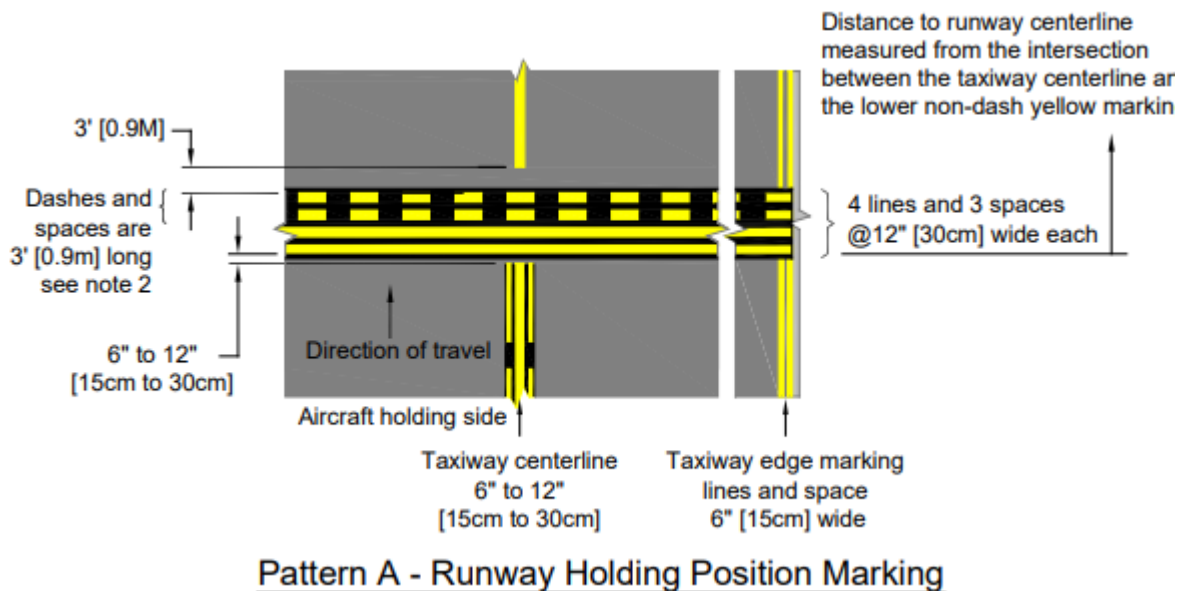


Figure 13: Runway Holding Position Marking Depiction (Source: FAA)

8.3.2 Runway Centerline Marking

The runway centerline marking identifies the physical center of the runway width and provides alignment guidance to pilots during takeoff and landing operations...

Location.

A runway centerline marking is located along the physical center of the runway width and spaced between the runway landing designation markings ...

Color.

The runway centerline marking is white...

Characteristics.

A runway centerline marking consists of a line of uniformly spaced stripes and gaps and of uniform width.

1. The stripes are 120 feet (36.5 m) in length and the gaps are 80 feet (24.3 m) in length.

2. The minimum width of the stripes is:

- a. 36 inches (90 cm) for precision runways.*
- b. 18 inches (45 cm) for non-precision runways.*
- c. 12 inches (30 cm) for visual runways.*

8.3.3 Taxiway Centerline Marking

Application.

All taxiways regardless of their width have a centerline marking, and whenever a taxiway intersects a runway, the taxiway should have a surface painted runway holding position marking. For Part 139 certificated airports, all taxiways that intersect a runway must have a surface painted runway holding position sign and an enhanced taxiway centerline marking. Taxiway edge markings are installed wherever there is a need to separate the taxiway from a pavement that is not intended for aircraft use or to delineate the edge of the taxiway that is not otherwise clearly visible. Examples of other taxiway surface markings that should be installed when appropriate and deemed necessary by the FAA (in some cases, with input from the tower manager of the airport traffic control tower (ATCT) include the Pattern A, B, and C holding position markings discussed in Chapter 3, the intermediate holding position markings for taxiway/taxiway intersections, geographic position marking, and the taxiway shoulder marking.

Taxiway Centerline Markings. Purpose. The taxiway centerline marking provides pilots with continuous visual guidance to permit taxiing along a designated path...

Requirement. All taxiways, regardless of their width, have a surface painted taxiway centerline.

Location. On a straight section of a taxiway, the taxiway centerline marking is located along the physical centerline of the paved taxiway. This statement assumes the taxiway was built to standard, i.e., symmetrical with a taxiway centerline. On curved sections of a taxiway, the taxiway centerline marking continues from the centerline marking of the straight portion of the taxiway along a curved centerline defined in AC 150/5300-13.

For taxiways that intersect a runway at any other locations than at the runway end the taxiway centerline marking curves onto the runway and extends parallel to the runway centerline marking for a distance of 200 feet (61 m) beyond the point of tangency with the runway centerline or terminates at the point of contact with the displaced threshold bar, whichever is less...these lead-on and lead-off taxiway centerlines are 3 feet (1 m) from the runway centerline when measured near-edge to near-edge.

1. For taxiways that cross a runway, which are either perpendicular to or non-perpendicular to the runway centerline, and are normally used as crossing taxi routes, the taxiway centerline marking may continue across the runway but is interrupted for all runway markings with some exceptions...

8.4 AC 120-74B

On July 30, 2012, FAA published AC 120-74B "Part 91, 121, 125, and 135 Flightcrew Procedures During Taxi Operations⁴⁸." The AC provided guidelines for the development and implementation of standard operating procedures for conducting safe aircraft operations during taxiing to avoid causing a runway incursion. Section 7 "Flightcrew procedures" provided, in part, the following guidance:

e. Flight Deck Verbal Communication/Crew Resource Management (CRM).

- (1)** *It is essential that all misunderstandings or disagreements be resolved to the satisfaction of all flightcrew members before taxiing the aircraft. It is the verbal aspect of this coordination that is most significant. It is not enough to assume that all flightcrew members have heard and understood the instructions correctly. A common understanding can be enhanced by one flightcrew member repeating the instructions verbally and getting agreement on the content and intent from the other flightcrew member(s). Any persistent disagreement or uncertainty among crewmembers should be resolved by contacting ATC for clarification.*
- (2)** *When flightcrew members verbally confirm their understanding of the instructions, they then have a chance to discover and correct any misunderstandings and thus prevent hazardous situations from developing. This verbal coordination/agreement should be accomplished at the following times.*
 - (a)** *When ATC issues a clearance for an arrival or departure, the flightcrew should refer to the airport diagram and confirm and verbalize the assigned runway and taxi route, including any instructions to hold short of, or cross, a runway. If there is any doubt, speak up and resolve the uncertainty.*
 - (b)** *When it becomes necessary for a flightcrew member to stop monitoring any ATC frequency to prepare the aircraft for takeoff or landing, he or she should tell the other flightcrew member(s) when stopping and resuming the monitoring of the ATC frequency. They should also reiterate any upcoming hold short instructions or clearances that could be misinterpreted. An example may include: "I'm heads-down, right turn ahead at Alpha," or "I'm back, any changes?" Time away from monitoring ATC should be avoided with complex taxi routing or crossing of runways. Any instructions or information received or transmitted during that flightcrew member's absence from the ATC frequency should be briefed and reviewed upon his or her return. NOTE: Heads-down time should only take place when the aircraft is taxiing straight ahead or stopped, or after it has landed and is clear of the active runway, with no upcoming hold short lines or hot spots.*

⁴⁸ [AC 120-74B](#)

- (c) *At complex intersections, the flightcrew should verbally coordinate to be sure that the intersection is correctly identified, and confirmed, using the airport diagram and the heading indicator, so that the aircraft transitions through the intersection to the correct taxiway.*
- (d) *When approaching any hold short line, verbalize "approaching (specific runway number) hold short line. Before crossing any hold short line, the flightcrew should visually scan to the left and to the right, including the full length of the runway and its approach paths, and coordinate verbally (e.g., "clear right/left" or that the scan area is not clear).*
- (e) *Before entering a runway for takeoff, the flightcrew should verbally coordinate to ensure correct flap setting, identification of the runway, compass heading, FMC entry, and receipt of the proper ATC clearance to use that runway. Similar verification should be performed during approach to landing.*

8.5 Wrong Runway Departures

The Commercial Aviation Safety Team produced a report in August 2007 titled *"Wrong Runway Departures"*⁴⁹. The report focused on wrong runway departure events for part 121 operators, which had occurred within the United States. The report stated that *"departures from a wrong runway are not required to be reported to the FAA under any reporting and data collection program if there is no loss of separation or associated accident event."* The report queried various databases, and those queries found 117 events from part 121 air carrier operations. About 71% of the reports were obtained from the voluntary ASRS⁵⁰ database. Of the 117 events, about 37 events involved performance issues, the remaining 80 events involved wrong runway departures. The report listed the airports that the 80 events occurred at and MCO was not listed.

However, the report listed five contributing factors to the 80 events, one of those contributing factors was *"A short distance between the airport terminal and the runway. A short distance between the terminal and the runway requires flightcrews to complete the same number of checklist items in a shorter timeframe and requires more heads-down time during taxi. Many of the event reports mentioned that the flightcrew members were rushing to complete their checklists or to expedite their departures."*

Additionally, the report cited two incidents (one in 2002 and another in 2005) in which a Part 129 air carrier attempted to depart on a taxiway that paralleled the assigned takeoff runway. In both occurrences the runway of intended departure had parallel taxiways, one on each side of the runway. In each of those events, the flight

⁴⁹ [Analytical Unit](#)

⁵⁰ Aviation Safety Reporting System

crew was cleared to depart from the runway; however, lined up on one of the parallel taxiways. In one of those events the airplane lined up and subsequently departed from the parallel taxiway.

The report went on to further provide proposed safety enhancements. Those enhancements sighted as much as an 80% risk elimination. Some of those enhancements would be used by a flightcrew in the cockpit, some by air traffic controllers, and others included enhanced surface marking.

9.0 Previously Issued NTSB Recommendations

A-07-44 - Require that all 14 *Code of Federal Regulations* Part 91K, 121, and 135 operators establish procedures requiring all crewmembers on the flight deck to positively confirm and cross-check the airplane's location at the assigned departure runway before crossing the hold short line for takeoff. This required guidance should be consistent with the guidance in Advisory Circular 120-74A and Safety Alert for Operators 06013 and 07003. - **Closed - Unacceptable Action**

A-07-45 - Require that all 14 *Code of Federal Regulations* Part 91K, 121, and 135 operators install on their aircraft cockpit moving map displays or an automatic system that alerts pilots when a takeoff is attempted on a taxiway or a runway other than the one intended. - **Closed - Unacceptable Action**

A-06-83 - Require that all 14 *Code of Federal Regulations* Part 121 operators establish procedures requiring all crewmembers on the flight deck to positively confirm and cross-check the airplane's location at the assigned departure runway before crossing the hold short line for takeoff. **Closed - Acceptable Action/Superseded.**

E. ATTACHMENTS

- Attachment 1 - Flight Crew Interview Transcripts, Statements and Erratum
- Attachment 2 - Flight Crew Training Records [Excerpts]
- Attachment 3 - Flight Crew Previous 90-Day Schedule
- Attachment 4 - Flight Crew Previous Departures from MCO
- Attachment 5 - Incident Flight Release Packet
- Attachment 6 - Incident Flight Weight and Balance
- Attachment 7 - Incident Flight ACARS Messages [Excerpts]
- Attachment 8 - Southwest Airlines Flight Operations Manual [Excerpts]
- Attachment 9 - Southwest Airlines Aircraft Operations Manual [Excerpts]
- Attachment 10 - MCO NOTAMs
- Attachment 11 - CAST Wrong Runway Departure

Attachment 12 - Party Forms

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