DIVERT (FROM THE PILOT'S POINT OF VIEW)

News / Airlines

di·vert
d??v?rt, d??v?rt/
verb: divert; 3rd person present: diverts; past tense: diverted; past participle: diverted; gerund or present participle: diverting
cause (someone or something) to change course or turn from one direction to another.

If you're reading this, there's a pretty good chance you're more than the average airline traveler. You're interested in aviation and what happens on the other side of the cockpit door. An aviation geek…maybe. Please forgive the term if it offends, but I wear the moniker with pride. At any rate, you most likely requested a window seat as no self-respecting #AvGeek wants to sit on the aisle. You peer out the window after reading through SkyMall for the hundredth time as the airplane starts to turn. There certainly isn't anything unusual about an airliner making a turn, except that this turn continues until it's clear you've reversed course.

Holding Pattern

There isn't a single person on the airplane who's happy about a holding pattern. "Why are we holding? I have places to be. Will I make my connection?" The possible scenarios that could lead to holding are almost endless, and albeit the most common, weather is only one. I've held due to

fog, thunderstorms, high winds, dust storms, VIP arrivals (Presidents, Vice Presidents and the like), air traffic congestion, other aircraft emergencies, emergencies of my own, and ground equipment failures…just to name a few. An ATC buddy of mine even told me he was once forced to evacuate a major airport control tower due to a break in a water supply line that flooded the facility. I'm sure that event resulted in holding for someone!

Back to your flight

For whatever the reason, the airport is no longer accepting arrivals and your flight just got caught the ensuing chaos. Fuel conservation may have a direct effect on the outcome, so the pilots have slowed the aircraft to its most economical speed and entered a holding pattern as directed by Air Traffic Control.

This may be the first time you were made aware of the possibility that the airplane might not be able to reach your planned destination. At least not in the time frame you were expecting. Happiness is often directly related to expectations. Were they, or were they not met. Clearly, arriving late or landing anywhere other than your intended destination does not meet your expectations and you aren't happy about it. Trust me when I tell you that the airline and its employees haven't been plotting against you. Generally speaking, weather forecasts for an hour before and an hour after your scheduled arrival are what drive the need for a planned alternate airport. Thus, a significant percentage of all flights are legally required to plan for the possibility of a divert that *never happens*. There's no sense in concerning passengers with this information until the possibility becomes reality; but rest assured, your flight dispatcher and pilots have been aware since well-before departure…and they're prepared.

Preparation is the key to success

Most pilots begin to consider how weather might impact a scheduled trip days before the actual flight. The Weather Channel and the national news are good resources for a big picture view. The day before a flight assignment, I consult the resources provided to me by my employer to educate myself and mentally prepare for the weather conditions I may encounter the next day. Then, on the day of the trip, I use those same resources to obtain a detailed route briefing and often chart my flight and its expected path. Everyone has their own ritual, but the point is this: your pilot knew the weather could be an issue long before you packed your bag.

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“Flight 123, I have a holding clearance for you. Advise when ready to copy.”

Those are words no pilot likes to hear and they mark the point where pre-flight planning is put to the test. On a lighter note, they also mark the beginning of the blame game. Some member of the crew made plans and really needed to get home. Any diversion is automatically that person’s fault!

Seriously though, the first task at hand is to set up and prepare for holding. On an aircraft equipped with a Flight Management System (FMS), the pilots input the holding location, radial, direction of turn and leg distance into the HOLD page of the FMS. If they’re lucky, the holding pattern is published and will load automatically when the holding point is selected. As the aircraft nears the holding pattern, the pilot will slow the aircraft in order to comply with the governing agency’s defined speed limits for holding. (In the United States, most airline holding occurs above 14,000 feet where the maximum holding speed is 265 knots.) The aircraft will enter the pattern and remain in holding until the pilot re-programs the FMS or manually commands the aircraft, either through the autopilot or directly with the flight controls, to do something else. Regardless, when properly programmed and confirmed by both pilots, the FMS and the autopilot are typically used to fly the holding pattern (with constant monitoring by the pilots, of course), giving the flight deck crew the opportunity to complete a few very important tasks.

Bingo!

As the aircraft continues to circle, attention shifts to the determination of what is commonly referred to as “bingo fuel”: the amount of fuel it will take to fly from the holding pattern to the planned destination, execute a missed approach and then proceed to the alternate airport with an appropriate amount of reserve fuel to spare. Anything over and above the bingo fuel can be used for holding and determines how long you’ll be able to wait for conditions to improve. Assuming

there's extra fuel to burn, the pilots would like to know the reason for the hold and how likely it is that conditions will improve in time to allow an eventual landing at the planned destination. If there's only 15 minutes of hold fuel in the tanks and thunderstorms aren't expected to clear for at least 30 minutes, then the pilot might elect to divert early. Advantages for diverting early include being the first one in line for re-fueling and the first one ready to takeoff once conditions improve.

As part of the initial holding clearance, Air Traffic Control issued an Expect Further Clearance (EFC) time to the pilots. However, the EFC can be misleading and is rarely an accurate indication of actual holding time, which may be shorter or significantly longer than the initial EFC. The real purpose of the EFC is to provide the pilots with a time to begin "Lost Communication" procedures in the unlikely event that radio contact is lost and cannot be re-established. Lost Comm is a discussion for another day and I won't bore you with the details.

With attention now squarely focused on fuel, the pilots will attempt to contact the dispatcher working their flight to discuss fuel requirements and to validate that the planned alternate is still a good option. The dispatcher has a big picture view of what's happening. They are able to see the weather and the traffic on a much larger scale. They can see who is holding, where they are holding, and who is being cleared out of the holding patterns. Armed with this information, the dispatcher is in a unique position to dispense valuable advice.

There are a number of reasons why the planned alternate may no longer be a good option. Weather conditions may have changed or there could be another airport in close proximity to the holding pattern that would make a better choice. It's also possible that your flight is late to the divert game. There's only so much room on the ramp at any given airport, so if multiple aircraft ahead of yours diverted into your planned alternate, there might not be a place to park. Another airport may better suit your needs.

Of course, the pilots will use every source of information available to them. The 737-800 that I fly is equipped with a Honeywell FMS system that offers the pilot an "alternate destination" page. This page, pictured to the right, allows the pilot to enter several possible alternates and it displays the distance to, estimated time of arrival, and most importantly, estimated fuel upon arrival at various destinations. It also allows to the pilot to input the same city with a "direct to" fuel estimate as well as an estimated arrival fuel if the pilot elected to fly to the destination, fly an approach and then proceed to the alternate. Handy information.

Alternates

An announcement no pilot wants to make and no passenger wants to hear

No, we haven't forgotten about you back there in seat 23A. Those of you who are awake and alert enough to notice are wondering about the racetrack shaped hole we've been burning into the sky. "Sorry for the delay, blah, blah, blah. Thanks for your patience." That part about "thanks for your patience" evokes a negative response from a lot of people and I rarely use the phrase. The PA should be short and simple. This is what's happening. It sucks. I get it. I'll make it stop as soon as I can. That's all I have to say about that.

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We often don't have a lot of information to pass along, but one thing I've found over the years, is that people don't like being left in the dark. Regardless of the situation, most people find it easier to resist an outward display of their inner frustrations if they receive timely and truthful information. Personally, I set a timer on my company-issued iPad and make certain that information is shared in 15-minute intervals, even if there is nothing new to report.

Decision made: Divert

At some point during holding, the pilots may have realized a divert was inevitable. Once the best airport has been decided, they retrieved the appropriate charts (or set them up in their iPads), set up for a particular approach, and dialed in the appropriate navigation and communication frequencies. Once the decision has been made, Air Traffic Control and the airline/dispatcher have to be notified and the FMS has to be reprogrammed for a landing at the alternate airport. As those tasks are completed, the aircraft descends out of the hectic environment above. The actual process of diverting the aircraft is relatively simple to execute. The majority of my diversions have been into smaller airports where the pace of life seems to be a little more laid back. The stress level drops significantly and won't rise again until after landing…which for me, is where frustration with "the process" often peaks.

"I'd rather be on the ground wishing I was in the air, than in the air wishing I was on the ground"

I've been in both positions and I can tell you the saying has it right. Once safely on the ground, all anyone wants is to get back in the air. Unfortunately, your flight is now what we call an Off Scheduled Operation. An OSO is something the airlines are well prepared to handle, but once a flight is off its scheduled route, nothing happens automatically. After an airplane lands where and when was expected, most of what happens next is choreographed well in advance. Fuel, flight planning, catering, and crew considerations were all planned days, if not weeks in advance. For an OSO flight, nothing is automatic and everything takes intentional effort and extra time.

Many smaller airports are set up for a handful of jet departures per day, many of which may be regional jets that require significantly less fuel. A single large jet could potentially need the weight of an RJ in fuel. Many airports, not accustomed to fueling large jet aircraft, don't have trucks capable of carrying enough fuel for more than one jet. With a trip to the fuel farm needed between each fill up and a long line of jets that need to be fueled, the delay could easily test the limits of the current Tarmac Rule as well as your crew's rest and duty time limitations.

I hate asking people to be patient, so here's some other advice, take it or leave it. The flight attendant does not know if you will make your connection. Don't bother asking. The pilot does not know when the plane will be fueled or when the thunderstorm will clear the airport. You may be talking to someone on a cell phone who says the weather is fine. This does not mean that it actually is, or that the weather between here and there is passable. Most airlines will let you off the aircraft if you insist, but I advise against it. You most likely will not be allowed back on the aircraft and a rental car will definitely cost you more time and money.

Going home…finally!

For whatever reason, Murphy's Law maybe, the weather almost always seems to clear up once I've committed to a diversion. I'm a strong believer in drawing a line in the sand with respect to bingo fuel, and I refuse to cross that line. Many pilots before me have been talked into reducing their personal minimums when it comes to fuel. I simply won't do it. As a result, I tend to divert about once every year…usually a result of poor weather conditions at the destination. 9 out of 10 times, the weather at the destination is beautiful by the time we make our tardy arrival. Clear skies, calm winds. Whatever rain fell seems to have long since evaporated. Go easy on the crew as you step off the plane. I guarantee landing at Tiny Town, USA was not on their wish list for the day either.

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