

ASRS

Directline



Summer 1992

- **The Visual Trap**
- **The One That Got Away**
- **Great Expectations**
- **Hold Short**
- **Taxi !**

The Aviation Safety Reporting System is a cooperative program established by the Federal Aviation Administration's Office of The Assistant Administrator for Aviation Safety, and administered by the National Aeronautics and Space Administration.



Several recent ground accidents have made members of the aviation community acutely aware of the hazards of the ground phase of flight operations. We at the ASRS share this sensitivity, and in response, three of the five articles in this issue of *ASRS Directline* deal with “on-the-ground” operations. Those articles are “*Hold Short*,” “*Taxi !*,” and “*The One That Got Away*.” We hope our analysis and suggestions in all areas of concern will have a positive impact on flight operations — for pilots, controllers, and all others interested in aviation safety.

ASRS Directline is intended to meet the needs of operators and flight crews of complex aircraft, and of ATC personnel who are looking for insight into more effective interaction with these operators. As with most safety information, we believe those in general aviation will find that *Directline*’s information is applicable and beneficial to their operations as well.

Articles contained in *Directline* are based on ASRS reports containing issues identified as significant by ASRS analysts. Distribution is directed to managers and management personnel, safety officers, and training and publications departments. Because our job and our interest is aviation safety, we encourage editorial use, reproduction, and distribution of *Directline* articles — we merely ask that you give credit to the ASRS and to the authors, and if possible, that you send us a copy of your publication so we have the satisfaction of seeing how our products are put to use.

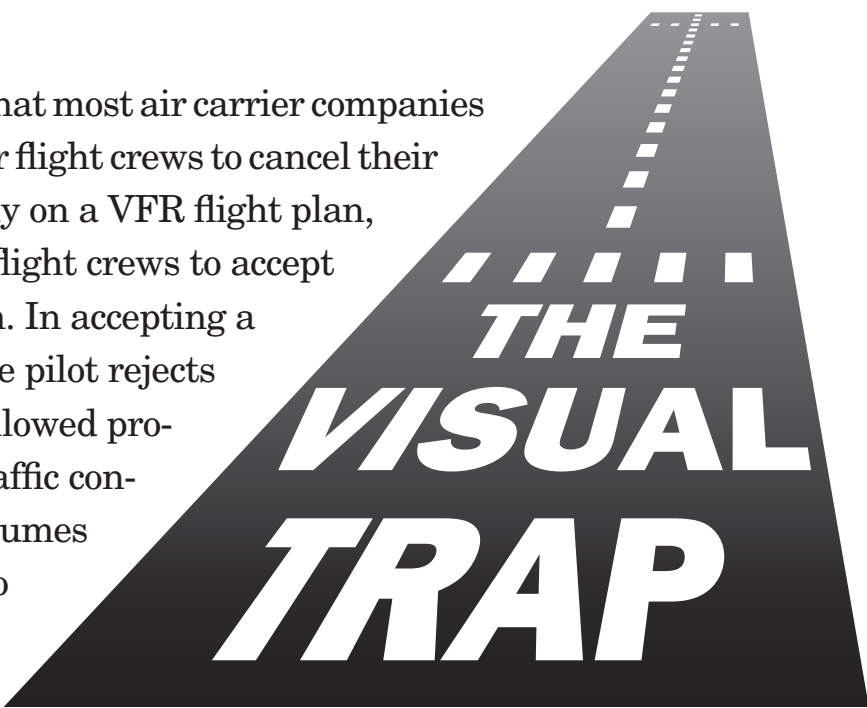
Here are the articles in this third issue of *ASRS Directline*.

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Reports received at the ASRS frequently detail the problems encountered by pilots when flying a visual approach. Review of ASRS report narratives provides a high degree of insight into causal and contributing factors. Perry Thomas has some good “heads-up” suggestions for avoiding the hazards of “ <i>The Visual Trap</i> .”	
The One That Got Away (Robert Petersen)	Page 8
Some ASRS reports detail seemingly bizarre events, but close examination suggests that any one of us could find ourselves in a similar situation.	
Great Expectations (Jeanne McElhatton)	Page 10
In the period following the Avianca accident in January of 1989, we have seen a dramatic rise in the number of reports that describe the confusion and concern in minimum fuel situations. Jeanne McElhatton examines the “ <i>Great Expectations</i> ” of flight crews when they declare “minimum fuel,” and provides suggestions for pilots and controllers alike.	
Hold Short (William P. Monan)	Page 14
Runway Incursion, Runway Transgression, Unauthorized Taxi — these are some of the terms used to describe “on-the-ground” incidents. As traffic volume grows, there is a greater potential for ground accidents and conflicts. This article closely examines the hazards of “Hold short of Runway” instructions.	
Taxi ! (Robert Sumwalt)	Page 21
A companion article to “ <i>Hold Short</i> ,” this article provides some sure-fire suggestions for avoiding the pitfalls of taxi operations. Perhaps you would like to make these ideas part of <i>your</i> S.O.P.	

To make suggestions for future issues, or just to tell us what you think about this safety newsletter, fill out and send in the Comments sheet at the end of this newsletter. We look forward to hearing from you.

— Charles Drew, ASRS *Directline* Editor

It is an anomaly that most air carrier companies do not allow their flight crews to cancel their IFR flight plan or fly on a VFR flight plan, but **do** allow their flight crews to accept the visual approach. In accepting a visual approach, the pilot rejects the historic and hallowed protection of the air traffic control system and assumes the responsibility to “see and avoid” other traffic.



THE VISUAL TRAP

The controller statement “You are cleared for the visual approach” is a welcome pronouncement for flight crews. There is an anticipated lessening of the workload, a quicker and more relaxed end to the flight. Yet many of the reports received at the ASRS detail unexpected and unwanted occurrences for pilots flying the visual approach,” — such as the following wrong airport landing incident.

“The weather was scattered clouds, thirteen miles visibility. [The] First Officer was the pilot flying, and I was operating the radios.

“We were being vectored by Approach Control to the airport ... I was inside [the cockpit] tuning the radios when Approach asked if we had the airport in sight. I looked up and out the window and saw ... the airport slightly to our left. I asked [the] First Officer if he saw it and he said ‘Yes.’ I told Approach we had the airport in sight, and they cleared us for the visual....

“Our position was such that we had to immediately configure for approach [and] landing. Our focus from that point was outside the cockpit. We ... were switched over to the Tower and cleared to land. We heard no more radio calls after that.

“On the landing roll it became obvious that something was not right. After some radio calls, we were informed that this airport was ... a few miles short of ... the intended point of landing.”

Benefits of the Visual

Given the potential for error such as this wrong airport approach and landing, why conduct visual approaches at all? Who benefits from visual approaches? Well, there are advantages for flight crews and controllers alike.

When pilots cross-check the visual with available electronic navigation, there is often a reduction in the level of navigation effort required; in addition there is a greater degree of flexibility in the planning and execution of their approach. Tighter sequencing, and what is often a more direct route to the airport translates into a reduction in flight time and fuel burn. At smaller or more remote airports where “full” approaches would otherwise be conducted, these savings may be considerable.

For controllers, a visual approach is an essential tool in the effort to maximize traffic flow (especially at busier airports). Visual approaches dramatically reduce controller workload — ATC’s IFR separation requirements are eliminated and the pilot assumes the burden for maintaining adequate separation.

The “Dark” Side of the Visual

The visual approach, intended to benefit everyone, frequently results in pilots experiencing exactly the opposite effect. Visual approach incidents reported to the ASRS frequently cite confusion, with resultant stress on the flight crews. There are a variety of performance errors revealed in ASRS reports.

While I paint with a broad brush, bear in mind that my negative impressions of the numerous serious hazards inherent in the visual approach have been gathered from reading and analyzing hundreds of ASRS reports on visual approaches, where the results of the visual approach produced unwanted results.

The Wrong Objective

Many reports indicate that airports or runways are either misidentified, or in some cases, lost after initial (and correct) recognition.

“I called for slats, flaps, gear down, and landing check. While turning final for the runway, we both commented ‘This isn’t right,’ at which time the Approach Controller called saying ‘Pull up, you’re looking at XXX [wrong airport].’”

And in another incident, the First Officer reports: *“At 500 feet AGL the Captain realized we were lined up with the wrong runway. I called [out, saying] I was going around.”*

Traffic

Too often the traffic that the flight crew agrees to follow cannot be identified. In some instances, the flight crew visually acquires the traffic, only to lose it through distraction or other problems.

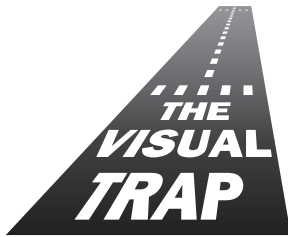
“While we were on a right downwind ... Approach asked us if we had the air carrier widebody (which we were following), in sight. We answered that we did. After we turned onto a right base for Runway 24R, Approach changed our Runway to 24L. I subsequently put the new runway into the FMC and the ILS into the ... [navigation] radio. Approach then called out small commuter traffic which I acknowledged. I then asked the Captain where the widebody was because I had lost him in the ground clutter after tuning the ILS....”

Misidentification of the required traffic is also a problem, particularly at busier airports.

“... [the Controller] asked us ‘Do you have the ... [aircraft] ... at your 11 o’clock?’ We responded we had the traffic. The traffic eventually passed our 9 o’clock. The Captain started his turn to base....”

Traffic that was following this reporter’s flight queried the reporter’s perceived early turn to base, and the reporter’s error was then discovered:

“... it’s really easy to pick out the wrong aircraft like we did....”



Visual approaches to parallel runways are especially rich incident-producing events; it seems logical that it is more difficult to maintain visual contact with parallel traffic than traffic you may be following to a single runway. A constant flow of reports to ASRS on flawed visual approaches highlights the hazards of losing sight of close proximity traffic.

“As Captain, I had the airport in sight out the copilot’s window as we were on base leg. As we approached downtown I overshot final, resulting in being lined up closer to the left runway than to the right runway. [The] Tower Controller advised we were encroaching on south complex airspace. He also advised we were close to another air carrier ... on final for the south complex. [The] Controller asked us if we had [the] air carrier ... in sight. We did not. In spite of good visibility, [the] air carrier [aircraft] was difficult to see in the background of buildings. We had to transmit several times to the Controller in order to sight and identify the traffic.”

And in another parallel approach incident ...

“... Approach gave us our co-approach [traffic] ... on the Tiptoe visual (we were on the Quiet Bridge) at about 20 miles out. I clearly saw him and figured we would be landing approximately together, he on 28L and us on 28R! At about 3 miles to go to the high span, on course but high, Bay [Approach] switched us to Tower. I changed frequency, looked back out and our co-approach [traffic] ... was crossing my course 30 degrees off my heading, about 1,000 feet lower. He passed to our right. We stopped our descent and slowed to keep him in sight! He then wrapped it up in a left turn back to the [left] runway.”

The reporter concludes with this admonishment:

“There is a time for basic airmanship and see and avoid — it is all the time!”

Landing Without Clearance

Most incidents of landing without clearance reported to ASRS are out of visual approaches — flights touch down with their crews having neglected to request their landing clearance. Reporters often cite complacency as a factor; others point to changes or increases in workload.

“While on initial approach we were held at a high altitude longer than desirable. Due to the steep descent path required to successfully complete the approach, our workload was increased. Due to the increased demands on us — because of the steep approach — we failed to contact the tower before landing.”

Too Quick Off the Mark

Flight crews may tend to “anticipate” a clearance when asked if they can accept a visual. Frequently reported are altitude deviations when the flight crew agreed they could accept a visual approach and then immediately started to descend — before the controller said the magic words that cleared them for the visual approach.

*“The First Officer was flying and overshot his turn to the radial — which was our clearance. [The] Approach Controller asked if we had the airport in sight, to which I replied ‘affirmative,’ although the First Officer did **not** see it. (Emphasis added.) [The] Approach Controller then said, ‘Cleared for the Quiet Bridge visual.’ The First Officer keyed ... [on] the word ‘visual,’ and started descent while I was attempting to program the FMC for the approach. [The] Controller advised [us that] we had busted our altitude.”*

Misused Resources

Many incidents reported seem to indicate that flight crews are overly optimistic regarding their ability to see and identify traffic, airports and runways, and often reply inappropriately to the query “do you have _____ in sight?”

Electronic navigation is frequently ignored or abandoned.

“Making a visual approach, we were cleared to land on Runway 33L from our present position approximately 10 miles ENE [of the airport]. Despite having our NAVAIDS tuned and the HSI set for ILS Runway 33L approach, we set up on base and turned final for visual approach to Runway 33R.”

It appears from what I read in ASRS reports, and from my own experience, that we all — all categories of pilots — have at one time or another (even frequently) succumbed to enticement, and accepted visual approaches when it was not timely or appropriate to do so. **Why do otherwise sane and sensible pilots consistently fall into “The Visual Trap?”**

I must conclude that the primary motivation, aside from the desire of the flight crew to cooperate with the ATC system and the controller in expediting other traffic, is to expedite arrival of their own particular flight.

Keeping the Objective in Sight

One of our better ways of learning how to stay alive in the flying game is to profit from the unhappy experience of others. Here are a few practical, no-nonsense suggestions from these same reports that should reduce some of the hazards.

For All Approaches

- ❖ Review and brief all applicable visual *and* instrument charts before the approach
- ❖ DO NOT identify traffic in sight, airport in sight, or runway in sight, unless you are certain of your identification, and your flight deck mates concur
- ❖ Keep your traffic in sight; if you lose your traffic, tell ATC
- ❖ Ensure that at least one pilot monitors the gauges and radios to “aviate, navigate, and communicate”

- ❖ Use all available electronic navigation to back-up the visual
- ❖ If visual approaches are being conducted but you don’t want a visual, insist on an ILS or other instrument approach. Bear in mind, however, that during your instrument approach, other aircraft in your proximity may be conducting a *visual* approach
- ❖ Expect visibility to deteriorate and be reduced if you are descending into a smog/haze layer, (and possibly the setting or rising sun), during the turn to base and final. This may lead you to misidentify the runway to which you are cleared.

For Parallel Approaches

- ❖ Be aware that **parallel** runway approaches means that there is likely to be other traffic close at hand. There may be a significant increase in flight deck workload — unless the flight crew briefs and prepares themselves to the maximum extent possible. Safety in visuals will be enhanced by close coordination between flight crew members, and by maintaining a careful traffic watch outside the aircraft
- ❖ Beware of overshooting runway alignment and encroaching into the parallel runway’s approach path
- ❖ **Beware the dangers of “The Visual Trap.”**

Credits

In putting together the information for this article, I have borrowed extensively from Captain William P. Monan’s NASA Contractor Report (Number 166573) entitled “Cleared for the Visual Approach — Human Factors in Air Carrier Operations.” Captain Monan’s report covers all aspects, pro and con, of visual approaches and it should be required reading for all thoughtful pilots who may be concerned about visual approaches.

The One That Got Away

by Robert Petersen

Sometimes the distinction between comedy and calamity is a very fine one; sometimes whether you view something as amusing or sobering depends on your point of view. Here's one that provides something to think about.

The Captain of an air carrier flight diverted to an alternate airport due to weather and encountered confusion after landing — with some unusual consequences.

The Captain's Story

"We were directed to [a] hard stand to await a gate slot and had [the] right engine operating. [We] required about 20 minutes of wait time for other aircraft to move before I settled into my spot on the ramp ... I was advised by Operations that my gate would be vacant in approximately 5 to 10 minutes. Apparently, more than just refueling re-dispatch was in order; but, I was not aware of the plans for disposition of the aircraft, crew, or passengers at this point. I elected to keep the right engine running for the short wait on the ramp. We were [then] cleared by Ground to taxi. We did so, and when clear of the other aircraft ... I taxied to [the] gate.

"While taxiing, my eye caught the fuel quantity gauges as I was concerned about my burn while on the ground. I was surprised to note the quantity was almost 10,000 pounds higher than when I parked. I assumed a system malfunction and had the First Officer check A/B systems — both read the same. Since the aircraft did taxi a bit heavier than when I [had] parked, I realized that we had been fueled while I was parked — with 95 passengers on board, no cockpit contact, and all doors closed. I don't normally sit glued to the fuel gauges while parked, and no other indication of the event was obvious. I was totally unaware of the event, not having been advised to expect refueling....

"What is even worse, the truck was connected and pumping fuel when we taxied. The fueler managed to emergency release the hose just [before] ... reaching the end of the reel."

The One That Got Away

Reading this report evokes the humorous image of a fuel truck racing along behind the taxiing airliner still connected by a length of hose — the airliner destined to become “the one that got away.” But the Captain didn’t think it was so funny:

“Normally I would execute a left turn out of this spot to parking. If I had done this, the outcome probably would have been much different.... Somebody dropped the ball here. I do have a right to know what is going on with my aircraft!”

We must give the fueler credit: he didn’t panic and run, but disconnected the fuel hose before disaster struck. The Captain subsequently discovered that “... the fueler was [apparently] employed by a ... firm ... [that] was contracted by my company to help out with the overload from the diversions.” (And therefore was likely not completely familiar with the air carrier company procedures — Editor.)

Getting the Message

Why hadn’t the fueler contacted the flight crew before fueling? There are a number of possible reasons — total confusion on the ramp because of the number of aircraft; the fueler did not realize the engine was running; was not aware of special procedures for fueling with passengers on board; assumed the Captain was aware his aircraft would be fueled; rushing to keep up with the task at hand. Regardless of the causes and factors involved, there existed a large opportunity for disaster; fortune dealt kindly with all involved — this time.

We could say more about the need for proper coordination between the dispatch office and the cockpit, and the need for adequate training of ground personnel, but this narrative speaks eloquently enough by itself.

Everything is funny as long as it is happening to somebody else.

– Will Rogers, 1879-1935

Great Expectations

by Jeanne McElhatton

Few in-flight problems are guaranteed to raise the concern of pilots and controllers alike as much as the prospect of an aircraft running out of fuel. In the period following the Avianca accident in January of 1989 (where Avianca Flight 52 crashed short of its destination after running out of fuel), the ASRS has seen a rise in the number of reports that concern “low-fuel” conditions. Reports may detail the confusion and communications breakdown among flight crews and controllers about what is meant by a “minimum fuel” situation. In more than a few situations, conscientious and understandably vigilant controllers have elevated to emergency status what the flight crew intended only as an advisory.

“While holding we decided to divert to LGA [La Guardia] and were asked of our fuel status. We told NY [New York] ARTCC it was fifty-five minutes, which would take us to our reserve fuel. But, apparently, this was interpreted as a minimum fuel situation. We never mentioned ‘minimum fuel,’ critical fuel, or emergency of any sort. Only on downwind to LGA, approximately thirty minutes later, did I become aware that something was out of the ordinary when we were told that the final was twenty miles long, and if we needed less to please let them know. We said that would be okay, but wondered why they even asked us that. Upon landing, we noticed that the emergency equipment was standing by.”

Given ATC’s reaction to what they may perceive as a critical fuel condition in this incident report, it’s not surprising that pilots might hesitate to use the term “minimum fuel.” Flight crews tend to feel that a controller response such as the one illustrated above will create mounds of paperwork, and they certainly wish to avoid that. This flight crew never even used the phrase “minimum fuel,” but their flight was handled as an emergency because they had mentioned their limited fuel status.

Sometimes, however, the scene plays the other way and the message does not get through even though stated clearly. The flight crew must then declare minimum fuel and request priority.

“Shortly after reaching cruising altitude of FL330, we were given a long delaying vector 90 degrees to our route of flight, followed by several more vectors. At this point we asked if ‘the vectors would continue, because we were burning most of our contingency fuel.’ We were promised this would be the last vector and [were] handed over to ZAU [Chicago ARTCC]. ZAU immediately initiated more delaying vectors, [which] caused us to declare minimum fuel and ask for priority handling into ORD [Chicago-O’Hare].... If priority handling was not asked for, I am certain we would have burned considerably more fuel and possibly had a more serious fuel situation.”

This flight crew stated their developing fuel condition; however, this information may not have been relayed to the next controller. Both controllers and pilots have a mixed perception of, and perhaps response to, the term “minimum fuel.”

Great Expectations—the Pilot’s Perspective

Pilot expectation of the use of the term “minimum fuel” is most often Air Traffic Control (ATC) assistance by way of direct routing, minimal or no holding, and no off-course vectors, but this expectation is not always operationally feasible. Minimum fuel does not mean priority handling to all pilots; it most certainly does not of itself indicate *emergency*.

Some pilots are very disturbed because they do not receive expected assistance when stating minimum fuel. Others are disturbed because a controller appears to unilaterally declare an emergency and give priority handling.

One pilot suggests that controllers do not really understand the term “minimum fuel.” He might well have included pilots in that statement.

“... When it became apparent that I was going to have to go into my reserve fuel, I informed the Controller that we were ‘minimum fuel.’ He asked if I was declaring an emergency, and I told him no. He then asked for my fuel status in minutes and I told [him] forty-five minutes. Later in the approach I heard another airliner being given a vector to make room for a priority fuel. I believe that ATC unilaterally declared an emergency for me without informing me, giving rise to my belief that they do not understand the minimum fuel statement as outlined in the AIM.”

Interpretation and semantics appear to be a major part of the great expectations mix-up. Terminology played a roll for this flight crew:

“Approaching the VOR we were told to slow and expect [a] hold. The Captain decided, wisely, that we would be fuel critical if we held the thirty minutes and then proceeded ... we were turning inbound second turn in holding. [The] Captain informed Center we needed to divert. [The] Center informed us we were now cleared direct if we wanted it. We took that routing. On switch over to Chicago Approach, Approach asked if we were declaring an emergency; [we] told them no. An interesting conversation took place regarding our fuel. The expression ‘fuel critical’ was used. Finally, Approach informed us [the term] fuel critical was an emergency, and they were declaring an emergency [on our behalf]. If fuel critical means you have an emergency, we were not fuel critical. I think minimum fuel would have been more appropriate in our situation.”

Note the reporter’s belated assessment of his choice of terminology. His final thoughts are correct; this would have been precisely the proper use of a minimum fuel declaration.

Controller Perceptions

What is the controller perception and/or expectation when “minimum fuel” is used? One Controller’s response was *“Minimum fuel doesn’t mean a thing to me.”* Another, and opposite response, is *“Understand you are declaring an emergency.”* Controllers are also prone to ask if assistance or emergency equipment is needed. They most often try to offer assistance, and may even declare an emergency — much to the flight crew’s dismay.

*“... The Captain stated he would be unable to accept the continued delay vectors as we were approaching ‘minimum fuel.’ The ATC Approach Controller gave us direct LGA and squawk 7700. At that time the Captain stated we were not declaring an emergency. The ATC Controller stated that **he** was declaring the emergency, and again gave us direct LGA and squawk 7700....”* (Emphasis added.)

Great Expectations

Conflict

Controllers declare emergencies — pilots resist the declaration, but expect priority handling. There is an obvious misconception in the use of the term “minimum fuel.” The phrase does not require, order, or demand priority handling; however, many pilots have come to use the term as if that is what it does mean — the “Great Expectation.” A pilot writes:

“... A second problem is that ATC did not give priority handling when we advised them of minimum fuel.”

Just as pilot and controller expectations may be quite varied, you can see their that responses are equally so. When information is passed from controller to controller, some information may get lost or misinterpreted. Each party, controller and pilot, has a specific job to accomplish. Those jobs can be accomplished with understanding, cooperation, and professionalism.

“After several attempts to acquire an EFC [expect further clearance] time or an indication of what delays were in effect, and with no definite reply, the Captain explained that fuel might be a problem. The Controller asked if [our] flight was declaring a ‘minimum fuel state.’ The Captain [then] declared ‘minimum fuel.’ Shortly thereafter, [the] flight received clearance to its planned FL330 and was given clearance enroute. With the subsequent helpful assistance from ATC, the flight proceeded to BOS [Boston] with no further problem.”

Take AIM

Let’s review what the Airmans Information Manual (AIM) states regarding minimum fuel.

5-85. MINIMUM FUEL ADVISORY

a. Pilot –

1. Advise ATC of your minimum fuel status when your fuel supply has reached a state where, upon reaching destination, you cannot accept any undue delay.
2. Be aware this is not an emergency situation, but merely an advisory that indicates an emergency situation is possible should any undue delay occur.
3. Be aware a minimum fuel advisory does not imply a need for traffic priority.
4. If the remaining usable fuel supply suggests the need for traffic priority to ensure a safe landing you should declare an emergency account low fuel and report fuel remaining in minutes. (Reference — Pilot/Controller Glossary, Fuel Remaining).

Note that this portion, referencing *pilots* specifically, states this advisory does **not imply a need for traffic priority**. What to do if the need for traffic priority develops? The message is clear — *declare an emergency*.

Let’s carry on with part (b) of the 5-85. Minimum Fuel Advisory, and see what is recommended for the controller.

b. Controller –

1. When an aircraft declares a state of minimum fuel, relay this information to the facility to whom control jurisdiction is transferred.
2. Be alert for any occurrence which might delay the aircraft.

Note that the minimum fuel declaration is an advisory only, it is not a specific request for priority handling. It should be considered a “yellow caution flag” indicating future problems may develop if undue delays occur.

Minimum Fuel

Air Traffic Procedures Handbook

Air traffic controllers may not refer to the AIM on a regular basis, but ATP 7110.65 references minimum fuel:

MINIMUM FUEL — Indicates that an aircraft's fuel supply has reached a state where, upon reaching the destination, it can accept little or no delay. This is not an emergency situation but merely indicates an emergency situation is possible should any undue delay occur.

Advice for Pilots

What can you do if minimum fuel gets you?

- ❖ Monitor fuel consumption and have an alternate plan if things don't look as if they will turn out as planned
- ❖ If you decide that a minimum fuel situation exists, or is likely to exist at some point down the line, determine the point beyond which you will **not** continue in accordance with the original flight plan and what your alternate plan of action will be
- ❖ Communicate! Tell ATC exactly what your situation is, and make sure they understand it. Inform the controller how long you can continue on their original clearance or route before a diversion becomes necessary, restate the situation to the new controller on a handoff, or otherwise clarify the situation if appropriate. Consider advising ATC on each successive frequency that a minimum fuel situation exists. Note the following communication that kept ATC aware of the minimum fuel situation:
- ❖ Plan ahead — don't wait until fuel is critical and the situation really does become an emergency
- ❖ Finally, remember the declaration of an emergency does not put you on trial. It may require a report to the company, or a "letter" to the FAA Administrator (only if requested), or it may not require a thing.

Advice for Controllers

What can you do to reduce both risk and frustration?

- ❖ Be aware of the nuances of a minimum fuel statement. What is the flight crew really saying? You may need to question the flight crew until the situation is mutually understood
- ❖ Remember to relay to the next controller the "minimum fuel" status of any aircraft
- ❖ Keep your expectations within the limitations of the advisory on minimum fuel.

So, take a fresh look at the term "minimum fuel." Do you and the AIM interpret it the same way?

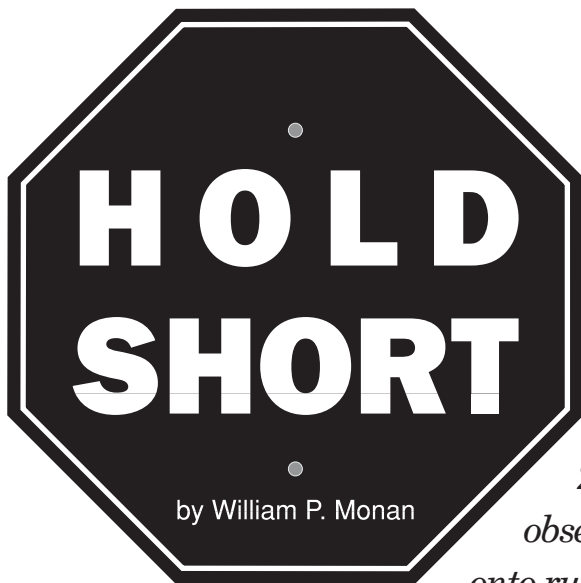
Final Thoughts

One ASRS reporter presented an interesting suggestion that would keep everyone informed of an unusual or abnormal fuel state:

"... [I] believe that an aircraft that is in a situation other than [a] completely normal fuel state should be assigned a specific transponder squawk that is clearly and universally defined to both pilots and controllers, [which] ... [indicates the low fuel] situation to all."

Excellent food for thought. This suggestion would keep communications to a minimum, would be passed along on the data block from sector to sector, or to another facility. The pilot could be asked to state specifics of the situation, which would hopefully clarify the situation for all parties. An interesting proposal to consider.

It has also been suggested that the FAA develop an ATC computer enhancement that keeps track of flying time remaining — as stated by the pilot during minimum fuel situations. At an appropriate time before fuel exhaustion, the aircraft's computer data block would flash intermittently to remind the controller of the flight's fuel status before it reaches the critical stage.



“My First Officer was flying. A military transport had landed on Runway 24[R], [and] was instructed to turn left and hold short of 24L.... We were cleared for takeoff on Runway 24L.... Just prior to lift-off speed, we observed [the] military transport start taxiing. He taxied onto runway 24L in front of us. We were then above the V_1 speed, and our only option was to continue the takeoff. We were able to lift off over the military transport, but had our gross weight been closer to maximum, we might have had a real problem. [Upon] ... arrival at our destination, I called the ... [departure airport] Tower, and their people confirmed that the military transport had crossed Runway 24L without a clearance. ”

Three on-runway collisions during the recent times have sadly confirmed the risks associated with on-the-ground operations at major national airports. Pilot and ATC controller submissions to the ASRS frequently describe near-accidents involving active-runway incursions and transgressions. Analysis of such reports suggests that the routine and commonplace Ground or Tower Controller instruction — **hold short of Runway XX** — can potentially pose one of the most serious hazards in the entire ATC communications system.

“On taxi-in ... I contacted Ground and reported clear of [Runway] 10. Ground said to hold short of [Runway] 22 at ‘Charlie’ ... I read back.... I completed the [after landing] checklist, called Ops and advised them we were on the ground (a required call) and then called Ramp Control to confirm our gate. I looked back up at the Captain ... and said, ‘Gate is confirmed and we are still to hold short of 22!’ He acknowledged me with a nod. I once again diverted my attention to the radio control panel ... when I looked up, Ground Control said ‘air carrier (XX), hold short of 22.’ At that time we were within 5 feet of Runway 22. The Captain slammed on the brakes. A small twin engine plane ... crossed directly in front of us on the takeoff roll. Had ... [he] been a larger aircraft with a greater wing span, there would have been contact!”

One hundred forty-one ASRS reports describing events that occurred between December 1987 through September 1990 were reviewed for this article. All errors were associated with three different phases of ground operations: taxi-out, taxi-in, and immediately after the landing roll-out. Most of these “hold-short clearance” reports entailed some degree of conflict (many of which were categorized as near-collisions). There were also go-arounds, and aborted or discontinued takeoffs.

The Hazards of “Hold Short of the Runway” Instructions

Multiple Factors

Incidents reported to the ASRS are seldom the result of a single factor. Reviewing the details of runway incursion narratives reveals a complex matrix of interrelated causes. Pilot and controller mistakes may be combined factors in an incident, or perhaps distraction on the flight deck coupled with reduced visibility and inadequate airport signage could be cited. In an effort to reduce this intricate mass of information to digestible classifications, this article will examine causal factors under three main topic areas:

- A. Airport Practices and Configurations,
- B. Flight Crew Errors, and
- C. Controller Errors.

A. AIRPORT PRACTICES AND CONFIGURATIONS

As might be expected, the majority of events took place at major terminals with complex taxiway layouts and multi-runway operations. Incidents were grouped according to three differing classifications: *Intersecting Runways*, *Parallel Runways*, and *Runway Configuration No Factor*.

Configuration

Intersecting Runways

The Intersecting Runways classification specifies multiple, intersecting, active runways in use (simultaneous landing and departure operations on crossing runways). This category accounted for the largest number of ground conflicts.

Frequently and vigorously, pilots voiced serious concern about the practice of simultaneous operations on intersecting runways. In such instances, flight crews are commonly advised — by ATIS or by controller restriction — to hold short of the intersecting runway upon landing.



Flight crews either accepted the mandatory restriction, or were advised “if unable, expect a go around.” “Intimidation,” fumes one indignant reporter. Two pilots, unwilling to accept the limited landing distances, were circled around for second approaches.

Examination of the report set confirmed the flight crews’ unease with “hold-short-of...” instructions to landing aircraft. A number of aircraft committed an active-runway incursion during roll-out. The explanations were varied: operationally, pilots “floated,” “tried to make a smooth landing,” came in “slightly high,” and/or “[were] ... concerned with a smooth deceleration.”

Combining distraction and communication factors with intersecting runways, pilots “forgot” the hold short restriction, “did not hear” the transmission when issued during reversing, or became confused as to “where the crossing runway actually was.” Another pilot “failed to consider” the reduced landing distance remaining available on the runway. Go-arounds, high speed aborts, and critical near collisions resulted from the intersecting runway transgressions.

“We were cleared for takeoff on Runway 28 with landing traffic on [Runway] 33; the landing traffic was a single engine light [aircraft] instructed ‘cleared to land 33, hold short of Runway 28.’ The [light aircraft] was going to land too long to hold short of 28, so he self-initiated a go-around as we were mid-field [on the] Runway 28 takeoff roll. The [pilot of the light aircraft] was instructed to make a left turn to avoid our flight path — which he did ... landing clearances that stipulate hold short of intersecting Runway instructions are dangerous.”

In another incident, one flight crew landing in poor visibility caused an abort as they continued through the intersection, then caused a second abort as they taxied onto a parallel runway.

Parallel Runways

Differing from the “Intersecting” category, the Parallel Runways classification includes those incidents where an aircraft exiting a runway after landing, inadvertently penetrates or crosses an active parallel runway. At many airports parallel runways may be very close together — with minimum distance between. This category ranked second in the number of conflicts.



“We were not mentally ready to stop so quickly after clearing the runway,” explained one pilot. “The runways are so close,” noted another reporter, “that you no sooner land and stop and you are right up to an active runway.”

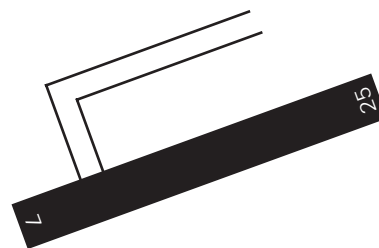
Another pilot, landing in reduced visibility conditions and then, still rolling with considerable velocity while exiting onto a high speed taxiway, nearly collided with an aircraft taking off on the adjacent parallel. He stated:

“The problem is that you arrive at the conflict point immediately after landing due to the proximity of the ... [adjoining runway].”

The combined “Intersecting” and “Parallel” runway classifications accounted for over three-fourths of the incidents in this review.

Configuration No Factor

Finally, there are situations where **Runway Configuration** is not considered a factor in the incident. An aircraft that penetrates the active runway on the taxi-out from the gate is typical of this incident category. The lowest number of ground conflict incidents were found in this category.



Practices

Signs

It was clearly evident in the narratives that, whether familiar or unfamiliar with the airport layout, flight crews relied heavily on the airport signage system to guide their progress through the complexities of interconnected, criss-crossing taxiways and runways.

“... ground instructed us to taxi via [taxiway] Papa to Runway 32L, on 32 hold short of [taxiway] Golf. No problem ... as both the Captain and I have been based at the aerodrome for several years.... I asked the Captain if he knew where ‘Golf’ was. He replied that he had no idea of where it was, but would continue taxiing on Runway 32 until he saw a sign. I told him I’d have a look at the airfield diagram. He relied, ‘Don’t bother with that,’ and continued taxiing. While I was heads-down digging out, and figuring out the airport diagram, we taxied past Golf, across 28C (an active runway), and stopped short of taxiway Charlie on Runway 32.”

The Hazards of “Hold Short of the Runway” Instructions

This reporter sums up:

“Factors: The Captain continued to taxi when unclear of [the] route. Complete lack of signs or other guidance on aerodrome. No sign at taxiway Golf or Charlie [was] visible from Runway 32 [while] taxiing southeast bound. First Officer should have had airport diagram page open and available, but did not due to familiarity and usual routine at [the] ‘home’ drome.”

And from other reporters:

“I had been to XYZ [airport] only three times in the previous three weeks and was depending heavily on visual clues such as signs and taxi or hold lines.”

“No aircraft should be cleared to taxi on a runway ... unless hold short lines, prominent markings, and signs are displayed at intersecting runways, as are displayed on taxiways.”

“If taxi operations are going to be conducted on runways with crossing runways, then having yellow hold signs on the runway could help.”

Other reporters suggested an alternative remedy. They ruefully concluded that instead of continuing to taxi while looking for signs, they

“... should have stopped and looked at the charts.”

Endless Pavement

At some airports, pilots erred at least in part due to a lack of visual cues on wide expanses of paved surfaces. Ramp areas, inner/outer taxiways, and active runways merged into a single and puzzling “concourse of un-colored asphalt and concrete.”

“All the taxiways had grass islands between them. They were subsequently torn out and paved over, so all there is now is three-quarters [of a] mile of concrete ocean with low-contrast yellow pavement markings over light concrete.”

B. FLIGHT CREW ERRORS

In incidents where flight crew error was considered the primary contributor to the problem, several causal patterns were identified. These categories included communication problems, loss of positional awareness, distraction, and finally, situations in which the flight crew may not have sufficiently compensated for conditions of reduced visibility.

Communication

Controller/pilot miscommunication reports could be attributed to misunderstanding of what was intended or said by the controller; failure to read back critical instructions; and simply not hearing instructions directed to the cockpit. Clearance misinterpretations and neglected readbacks were typically pilot problems, while the “didn’t hear” phenomenon could often be attributed to inopportune timing of ATC instructions, that is, during periods of high cockpit workload.

Misunderstanding

Flight crew misunderstandings of their hold short clearances developed from the garden path taxi instructions “to follow that ZZ aircraft in front of you to Runway YY, hold short of Runway XX.” Three flight crews “were led to believe,” or “understood,” that when the aircraft they were following was cleared to cross Runway “XX,” their flight needed no additional clearance to cross the active Runway “XX”.

“... we were still following [aircraft] X as we were told to do. As [aircraft] X was crossing 8L, his jet blast was blowing snow, temporarily lowering visibility. After he crossed the runway and the visibility began to improve, we started to cross 8L [as well]. We were almost across when we heard the tower cancel air carrier B’s takeoff clearance.”



Readback

When flight crews misheard or misinterpreted their “hold short” instructions, the abbreviated response of “Roger, ABC,” eliminated a crucial element in pilot/controller communication — that of the controller’s ability to confirm the flight crew’s readback. In post-incident reflection, reporters regretted their short cut procedures:

“I guess it was my fault for not giving a full readback ...”

“Our mistake was in not reading back the Controller’s instructions ...”

“A complete readback on my part ... would have prevented this incident.”

A Controller noted the second purpose of the double check step:

*“Perhaps a full readback would have helped me catch **my** mistake?” (Emphasis added.)*

In an attempt to pass the buck, several reporters blamed the Ground Controller for not issuing instructions to acknowledge all hold short clearances.

Too Busy to Hear...

Reporters criticized the issuance of hold-short messages during periods of high workload, particularly when busily occupied with reversing, slowing, and braking on the runway. Pilot preparedness for potential hold short clearances could reduce the number of incidents in which unfortunately timed ATC instructions are a factor.

“... we were so ... [involved] with the landing and roll-out that we honestly did not hear the requirement to hold short.”

“... [a] twin turboprop ... rotated and climbed out over me.... ATC issued my taxi clearance and holding instructions while I was still rolling out from my landing, where workload is high....”

“The [ATC] instructions to hold short of Runway 9L ...’ came at a very bad time, and I missed it due to involvement in landing.”

Positional Awareness

Many reports cited errors in the flight crews’ perception of their position. Thirty-three pilot reporters attributed their inadvertent blunders onto active runways to their uncertainty about their precise location on the airport. Frequently used was the term “confusion:”

“Captain became confused ... I was momentarily confused ... I repeated back the instructions to hold short of Runway XX before I knew exactly where I was ... I became confused as to where Runway XX actually was ... I found the intersections of Runways 36 and 23 and Taxiways Romeo and Lima confusing ... taxiways, runways and intersections — extremely confusing.”

The Hazards of “Hold Short of the Runway” Instructions

Attention Management

The chronic problem of distraction emerged in twenty-three hold short incidents. At times, both pilots were “heads turned around” as “the Flight Attendant entered the cockpit with coffee ...,” or “heads down” as both pilots focused upon FMS entries.

The source of breakdown in attention management (task management) on the flight deck are ranked as follows:

- Checklists
- Passenger announcements
- Company radio calls
- Miscellaneous (system malfunction, putting away manuals, etc.)
- Flight attendant entering the cockpit
- Conversation
- FMS programming.

In taxi-out, reporters consistently referenced necessary but distracting tasks such as starting up an engine, running pre-takeoff checklists, and making the required passenger announcements. In taxi-in, reporters cited after-landing checklists and company radio calls. The distraction pattern was consistent: the pilot taxiing the aircraft did not adhere to the hold short instruction while the non-taxiing pilot was preoccupied with inside-the-cockpit tasks.

“This incident could have been avoided if our company did not pressure the flight crews to spend so much time talking to the passengers when we should be operating the aircraft ...” complained one First Officer.

The breakdown in cockpit cross-check duties during taxi is recognized by flight crews. “... A common problem ...” summarized a reporter, “is how the first officer is loaded up with work while we are taxiing out to a point that he/she can’t always pay attention to the taxi procedure.” (This applies to any pilot handling communications chores.)

The non-flying pilots’ workload distractions were most critical when the aircraft neared the departure runway. With the First Officer running the pre-takeoff check lists, or being off tower frequency while making the passenger departure announcement, there was no double check on Captain misunderstandings of “hold short” and “hold,” as a clearance for “position and hold.” Go-arounds frequently resulted.

“We were number two for departure on Runway 24R.... The first aircraft was cleared on the Runway for takeoff. At this time, the First Officer began to make the departure passenger announcement to the Flight Attendants. Simultaneously ... Tower, as I understood ... [incorrectly], said ‘... cleared into position and hold.’ Since the First Officer was still making his passenger announcement, I acknowledged [the instruction].... An aircraft on final had to go around.”

Visibility Problems

Restricted visibility — blowing snow, fog, and rain — served as contributory factors in three reports of flight crew disorientation. Such conditions call for extra caution on the part of pilots and controllers alike.

“Due to the visibility restrictions, I didn’t know where we were. I stopped. As I stopped ... a company jet passed us left to right with minimum clearance.”



C. CONTROLLER ERRORS

The limited number of ATC controller reports in this classification did not permit a ranking of cause and circumstance for incidents perceived to be controller-induced events. Nonetheless, a review of reports in this study does indicate that incidents spanned a range of mental lapses, verbal slips, and visual misperceptions. Controllers neglected to tell aircraft to hold short, *“thought one thing and said another,”* and became workload distracted with other aircraft movements. *“The airplanes moved faster than my attention,”* was one Controller’s explanation for a “near-tie” at a runway intersection. In four go-around events, Tower Controllers cleared air carriers into position and hold with an aircraft on short final.

The following causal factors were identified in reports of controller lapses:

- Missed erroneous readbacks of hold short messages
- Failed to issue hold short instructions
- Mis-coordinated with Ground or Tower Controller positions
- Distracted by other traffic
- Distracted by conversation in the Tower
- Miscellaneous: inadequate briefing of relief, developmental controller error, changed his mind, etc.

Hearback

Controller hearback misses of erroneous hold short readbacks were confirmed by “running the tapes.” In six incidents, erroneous readbacks of hold short instructions were not caught by the controller. Two reports suggested heavy traffic volume as the underlying factor in controller errors.

“I was preoccupied with trying to move some ... [aircraft around delayed aircraft] ... and didn’t hear air carrier X read back that he was crossing ... with a departure rolling on [the] runway....”

Critical Timing

Timing of important communications was a factor in a number of incidents where flight crews did not hear hold short clearances during the roll-out after landing. (It is suggested that controllers attempt, as much as practical, to time their instructions for periods of lesser workload — and provide lots of time.)

“I did not hear the instructions because of being busy bringing the aircraft to a stop.”

“Immediately after landing, the Tower Controller issued us some lengthy instructions, which we neither could hear nor pay attention to until we came out of reversing and slowed [up].”

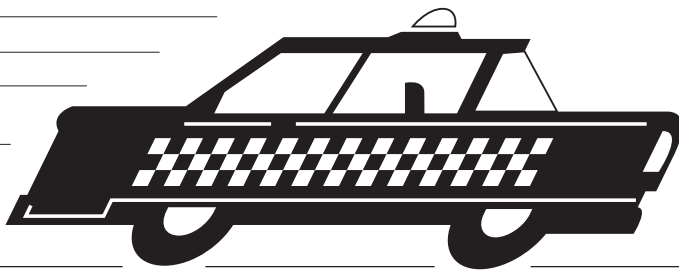
Look!

Frequently associated with the set of controller errors were pilot admittances of failing to visually check for other aircraft before crossing an active runway or moving into position. Controllers and pilots together need to maintain an eagle eye.

A Final Thought

Overall, whether in taxi-out, taxi-in, or in the after-landing roll-out phase, this review serves to identify the hazards in the common place instructions “Hold Short of Runway XX.”

Editor’s Note: Refer to the next article in this issue — “TAXI!” — for conclusions and recommendations for “on-the-ground operations.”



TAXI!

by Robert Sumwalt

Eliminating Taxi-Related Problems — A Few Sure-Fire Tips

Even something as routine as taxiing poses its own set of potential safety-related problems. They aren't just limited to dented wing tips and excursions through the grass, either. Some taxi-related problems are quite serious. Of the seventy-five ASRS taxi reports reviewed by this author, most involved unauthorized runway transgressions. In this article we hope to offer a few practical suggestions towards eliminating future taxi-related problems.

Runway Transgressions

Runway transgressions can be deadly. In fact, the worst accident in aviation history occurred due to a runway transgression at Tenerife, Canary Islands. Five hundred and eighty-three souls perished in that 1977 accident.

Fortunately not all runway transgressions involve accidents, but the potential for a catastrophe accompanies each and every one of them. While a national effort is underway to reduce runway transgressions, FAA figures reveal that the percentage of pilot-caused runway transgressions has increased since 1988. According to the FAA's Office of Safety Analysis, of the two hundred twenty-four runway transgressions reported in 1991, forty-one percent were pilot-caused. What can be done as an operator or flight crew to decrease the threat of runway transgressions?

Before Departing the Ramp

ASRS reports reveal that some precautions can be taken before leaving the ramp. For instance, several runway transgressions in this data set occurred because crews became disoriented while taxiing. Several others reported that the lack of conspicuous taxiway markings and signs contributed to a runway transgression. No doubt these problems could be minimized if crews would place the airport diagram chart where it could be easily referred to during taxi. Reported one pilot:

"Had I not violated one of my own rules [of] having the airport diagram out in plain view, I don't believe this incident would have happened."

And in another incident, an air carrier First Officer stated:

"I asked the Captain if he had any idea where [taxiway] 'G' was. He replied that he had no idea, but would continue taxiing ... until he saw a sign. I told him that I'd have a look at the airfield diagram. He replied, 'Don't bother with that,' and continued taxiing. While I was heads down digging out and figuring out the airfield diagram, we taxied across ... an active runway."

To be really effective the airport diagram should be located where it can be referenced without looking away from the taxiway. Some aircraft are equipped with chart holder "clipboards" on the side window frames. This is an ideal place to put the airport diagram. For aircraft that aren't so equipped, a piece of masking tape in the window frame works fine.

A few ASRS reports indicate that a runway transgression occurred because the Captain did not hear the clearance to hold short of a particular runway or taxiway. Reported one Captain:

"I understood that we were to taxi to Runway 25 but I did not hear the 'hold short of Runway 34' restriction."



There are several reasons why the Captain may not hear or comprehend “hold short” clearances. These include distractions, blocked radio transmissions, a mindset to taxi to a particular runway when another runway may be in use, and rushing. One noted problem is that sometimes the First Officer calls for the taxi clearance while the Captain is still off-frequency talking to the pushback crew on the interphone. One ASRS report revealed:

“Contributing factors: a rushed atmosphere in the cockpit.... This resulted in distractions and work overload, i.e., calling for taxi while starting engines.... Captain and Flight Engineer were not monitoring [radios] as a backup to the First Officer.”

Here are a few suggestions that can help combat these traps. First, the initial call to Ground Control or Ramp Control for taxi clearance should not be initiated until the Captain and First Officer are both monitoring that frequency. This ensures redundancy while critical taxi instructions are being issued.

Next, whenever a “hold short” clearance is issued, the Captain and First Officer should repeat the hold short clearance to each other. If a pilot fails to verbalize the clearance, the other pilot must then challenge him/her to be sure that the clearance was understood.

Finally, it’s suggested that the First Officer write down the taxi clearance and holding instructions.

Distractions, Distractions

Several pilots complained that cockpit distractions contributed to their runway transgression. Examples include distractions caused by completing checklists, obtaining weight and balance information, and loading flight management computers. ASRS narratives include statements such as:

“I was busy running checklists and not looking outside.”

“The First Officer was preoccupied with paperwork and not monitoring the taxi progress until after crossing the active runway.”

“My attention was diverted inside the cockpit as new weight and balance information was received from company via ACARS.”

“I changed frequency (per company procedure) to get takeoff closeout data. At this time, the Captain taxied [without clearance] onto Runway 11.”

“My First Officer was busy receiving our weight and balance data via ACARS and loading it into the computer. Had he been more in the loop he might have had time to review his taxi chart and point out that I was going the wrong way.”

Another air carrier pilot reported that he became distracted when a Flight Attendant entered the cockpit to give the passenger count.

“[We] took off, and to this moment, I do not remember being cleared for takeoff. This had the potential for a ‘Canary Islands’ takeoff accident. Company procedure for flight attendant cockpit visit while taxiing contributed....”

Air carriers are urged to review their policies and procedures to look for and eliminate practices that could contribute to taxi distractions. Paraphrasing FAR 121.542:

“No certificate holder shall require, nor may any flight crewmember perform, any duties during a critical phase of flight except those duties required for the safe operation of the aircraft.... Critical phase of flight includes all ground operations involving taxi....”

Can weight and balance information be delivered at the gate instead of during taxi-out? Can checklists be rewritten to minimize distractions during taxi-out? And is it really necessary to require pilots to call station operations to report “on the ground” after landing? Reported one crew:

“After landing ... I called ops on company radio for gate [assignment] and got distracted with a short conversation about service requirements. I then realized that we had just crossed Runway 27L [without authorization].”

Careful on Inactive Runways

A few runway transgressions occurred when pilots were instructed to taxi on inactive runways. Because runway surfaces are designed for takeoffs and landings, they are not marked for taxiing. Therefore the usual cues such as holding lines for intersecting runways probably will not be present. Following a runway transgression one ASRS reporter offered:

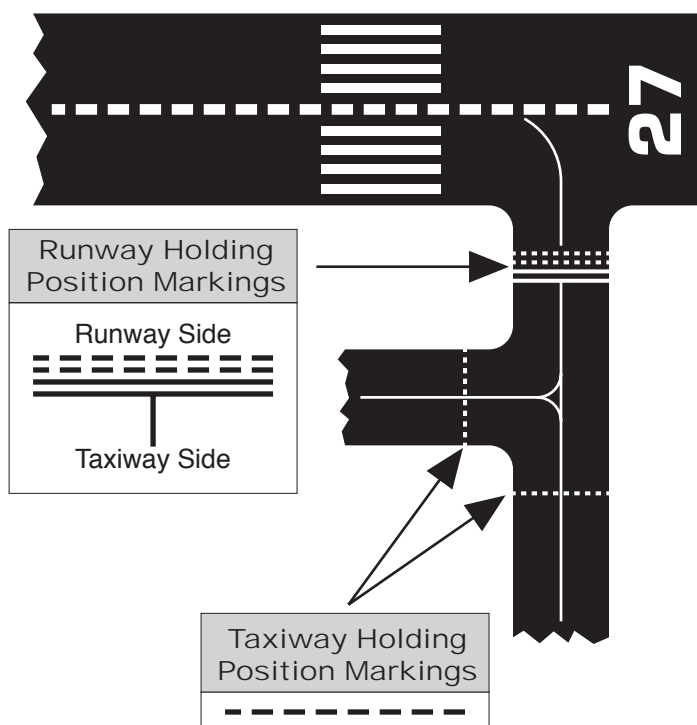
“If taxi operations are to be conducted on runways crossing [other] runways, then having yellow hold short lines on the runways could help. Maybe that one additional visual cue might have done the trick [in preventing my runway transgression].”

Because of the lack of these markings pilots should be particularly alert when taxiing on runways.

Runway Holding Lines: Back to Basics

Sometimes to resolve complex problems it may be necessary to go back to basics. And as basic as it may seem, a few ASRS reports indicate that some pilots have difficulty distinguishing the “holding side” of runway holding lines from the “non-holding side.”

Recall that holding lines lie perpendicular to the taxiway and consist of two continuous and two dashed lines, each spaced six inches apart.



According to the Airman’s Information Manual:

“When approaching the holding lines from the side with the continuous lines a pilot should not cross the holding line without ATC clearance at a controlled airport, or without making sure of adequate separation from other aircraft at uncontrolled airports.”

Caution After Landing

ASRS reports also indicate that problems can arise when pilots turn off onto another runway after landing. Reports a Controller:

“[A medium large transport] landed on Runway 22 and turned onto Runway 28. [Another aircraft] was on Runway 28 in position ready for departure.”

A pilot reported:

“After landing, Captain cleared onto Runway 13. I noticed that the Tower had an aircraft in position on Runway 13.”

Another stated:

“... we exited Runway 3 [onto Runway 33]. After our turnoff was completed we observed an aircraft on final for Runway 33 ... The aircraft on final was instructed to go around....”

It’s important to understand that the Airman’s Information Manual states that when clearing a runway after landing, pilots should not turn onto another runway without authorization from the tower. Perhaps a study of the airport diagram prior to landing would help here by increasing situational awareness.

Hazards to Equipment and Personnel

A couple of ASRS reports illustrate hazards associated with beginning taxi without obtaining the “all clear” salute from the ground crew. A jump seat rider observed:

“The Captain pushed up the power and released the parking brakes even though he had not received the required salute and release from [the pushback ground crew]. When the Copilot looked up he found the [widebody aircraft] moving between 5-10 m.p.h. Knowing that we



had no clearance from the ground crew, and unable to see the ground crew under the nose, he slammed on the brakes to stop the aircraft. Three Flight Attendants were slammed into the bulkheads and injured, one seriously.”

The reporter surmised:

“This incident occurred, I believe, because the Captain did not know the significance of our company SOP, which [states] that a taxi clearance is not to be requested until the salute and release from [the ground crew] is received. As an observer, I got the feeling that this Captain was mostly interested in minimizing ground time. The risk involved in the pushback procedure apparently had a lower priority to him than a fast getaway.... He seemed unconcerned with the possibility of running over and possibly killing the tug driver.”

Another crew reported that they struck a deicing truck after beginning a premature taxi. The reporter explains that rushing and “the lack of coordination between the cockpit and ground personnel” contributed to the incident. “After deicing [was] started and the [deicing] truck moved rearward no ground personnel were [visible to] the cockpit [crewmembers]. [This led] to the assumption by the Captain that deicing had been completed.” Be careful with assumptions.

May All Your Taxiways be Smooth

Although the act of taxiing an aircraft to and from an active runway may seem a little routine, ensuring that it is done safely requires planning, coordination, and attention. And more than just one set of eyeballs on a swivel is also necessary.

Let’s review some of the things which can help flight crews make that taxi operation safer:

- ❖ Ensure that **all** members of the flight deck crew review the airport diagram **before** beginning the taxi-out

- ❖ Locate the airport chart where it is readily available for reference and is in plain view at all times
- ❖ Write down those taxi instructions and any hold-short clearances
- ❖ Don’t start your taxi from the gate until you have received the all clear from the ground crew. Make sure that Captain and First Officer are watching for obstacles; remember that when aircraft hit stationary objects, it is usually in close proximity to the gate
- ❖ Reduce distractions. Take your tasks in sequence, and don’t let a trivial duty interfere with more important matters
- ❖ Use caution when taxiing on inactive runways, especially when they cross an active runway — they lack the usual taxiway marking such as hold short lines
- ❖ While on taxiways, watch carefully for taxiway/runway hold lines — do not cross them unless all flight crew members agree that clearance to enter a runway has been received. Confirm your right to cross with ATC if there is any doubt
- ❖ Review the airport chart **before** landing too. Use special care where a turnoff taxiway crosses another runway, be it active or inactive
- ❖ Use the same caution during the taxi-in to the gate as you did leaving it. Don’t allow fatigue or get-home-itis to get in the way. Remember, just five more minutes or so of alertness will see you safely home.

Any pilot knows the danger of a midair collision. But stop and consider this: the likelihood of a collision with another aircraft, vehicle, pedestrian, or other object while taxiing is about three times greater than the chance of striking another aircraft in flight. Now then, is taxiing as routine as you may have thought it was?

Comments?

If you have comments about *ASRS Directline*, or perhaps wish to make a topic suggestion for future issues, write your comments here — we will be pleased to read them.

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