US Airways PRM Update

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There's been quite a bit of talk at our airline lately about Precision Runway Monitor (PRM) ILS approaches. By now, most of us have been trained in the procedures, but there is still a great deal of confusion about the whole program. This past December, the Company issued a Flight Operations Bulletin authorizing us to fly these approaches. However, then-Central Air Safety Chairman John Cox immediately notified the Company that US Airways pilots would not be participating in the program until a list of concerns was addressed and corrected. The Company wisely responded by putting the program on hold and asking the ALPA Safety Committee to investigate PRM further.

ALPA's position from the beginning has been that we will look at whatever the FAA has to offer in the way of capacity enhancement. However, any "improvements" to the ATC system must not only maintain the current level of safety, but also *increase* it. We must have a system that minimizes the risk to our pilots and passengers.

In response to the Company's request for more data, I was invited to travel with Captain Cox and then-CASC Vice Chairman Terry McVenes to the Minneapolis-St. Paul (MSP) TRACON facility on January 18 to study the PRM operation there. Given the checkered history of this program and the FAA's disorganized approach to implementing it, we were extremely skeptical. Most of what we had heard about the program was negative, with very few positive aspects for pilots.

We began our day by meeting with Marty Coddington, a retired Mesaba Captain and ALPA National consultant. In addition to being a pilot, Marty has an extensive ATC background. He has been involved with the PRM program from its inception, and has a wealth of knowledge. He drove us through the frigid wind chill of Minneapolis to the MSP TRACON facility to meet with Cindy Green, the FAA Program Manager for PRM at Minneapolis. Cindy took us to a backup PRM scope where we could all sit and watch the aircraft move down the localizers in real time. We spent more than three hours there grilling her about the system.

As the morning progressed, we learned more about PRM's past and future. We came away with a much more positive view of the system than we started with. Half of this battle is education—the FAA didn't educate anyone about this. They just sort of said, "It's ok, you don't need to understand or approve of this procedure, just do it." For pilots, that kind of explanation doesn't go down very well. It appears that they are slowly learning their lessons.

History of the system

The FAA devised the Closely Spaced Parallel Approach (CSPA) program to reduce spacing between aircraft on final at certain airports, with the intent that a particular volume of aircraft flying closer together may increase capacity at that airport.

In theory this sounds like a good idea. However, there are a number of safety issues in-

volved whenever you fly aircraft close to each other. Mainly, reducing distances reduces the time to react to a problem, and increasing capacity reduces the space you have to fly away from a problem. These are just a couple of the problems inherent in the program.

The heart of the PRM system is a non-moving, phased array radar tower at the airport. It feeds high resolution, fast update, color radar screens known as Final Monitor Aids, or FMAs (one screen for each runway being operated under PRM).

The FAA installed the prototype PRM system at Raleigh-Durham (RDU) several years ago. It was tested for a brief period and has since been mothballed. There were quite a few technical problems, such as poor localizer accuracy and false TCAS RAs (due to earlier versions of TCAS software). Incidentally, most of these problems have been satisfactorily addressed at the MSP operation. One important point to note, though: it was originally assumed that the system would be "transparent to current operations." As we all know, it hasn't really turned out that way. There's a lot more for us as pilots to think about when flying one of these approaches as compared to a normally spaced ILS.

The MSP operation

The Minneapolis PRM system was the first, and currently the only, complete operational system to be installed. It underwent a scheduled test period and is now operating to published CAT I minimums. The localizer is capable of CAT II level tolerances, but CAT I minimums are used due to antenna placement limitations. Future systems at other airports will likely be used to at least CAT II minimums.

The system is set up to operate principally during heavy arrival periods or rushes. Here are a few statistics on PRM at MSP:

- During VFR operations, the airport handles a maximum of 66 aircraft per hour (reduced by one quarter aircraft for every B-757, and one half for every heavy) with both parallel runways open.
- During IFR with normal, staggered parallel ILSs, the rate is 48-56 aircraft per hour.
- The goal of PRM at MSP is to bring in as many aircraft under IFR as they do on VFR days. As you can see, that's a pretty significant improvement in capacity.

Unfortunately, MSP has not seen the maximum capacity increases that this system promises. Out of 35 attempts to run PRM since last September, only three have been run successfully! The main reason for this is pilot non-participation. Here are some reasons why crews do not participate:

- Crews are not trained or don't think they've had complete training.
- Crews are trained but are not allowed by Company ops requirements (like us) to participate.
- Crews are trained but have some kind of MEL or other equipment problem (transponder problems, DME failures, etc.).
- Crews refuse the approach "on principle."

As with any other type of approach, Captains always have the option of refusing the approach. Keep in mind, though, that the ramifications of refusing this approach are wide-reaching. For example, if for some reason a crew refuses any other type of approach, they are vectored to another approach or to their alternate. With PRM, however, this throws a great big wrench into the works. As the system currently operates, the whole PRM system is shut down and normal staggered approaches resume if more than four aircraft refuse to participate. In fact, they cannot even start running PRM if more than four aircraft give advance notice that they will not participate during the rush.

There's some speculation from the folks running this thing that a mix-and-match of PRM and non-PRM might be possible. Individual controllers tell us this is technically and operationally not a problem for them. Unfortunately their association, NATCA, doesn't see it that way. This is something that we will monitor and try to influence as much as possible, because we feel that it is to everyone's advantage to be able to combine PRM and non-PRM approaches during the same rush of flights.

Where will we see PRM next?

New York – Kennedy International (JFK)

- Sometime in the next few years.
- Parallel independent ILS approaches with 2.5 degree offset.

St. Louis – Lambert Field (STL)

- Currently in process.
- Will be used as final monitor for LDA approaches.

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- Will fall under Simultaneous Operations to Intersecting Runways (SOIA) program.
- STL would like to adapt to MSP-type PRM operations, but their runways are only 1,200 feet apart. We think this one will never happen, but we'll continue to monitor the situation.

San Francisco International (SFO)

- Bought system that was originally to be delivered to Atlanta - Hartsfield (ATL).
- As currently planned, system will be used for dependent visual-only approaches (750 feet between runways).
- Also being looked at for a new runway planned 3,400 feet north of Runway 1/19.

Philadelphia International (PHL)

- Timeframe is unclear, probably fairly soon (within the next year).
- System is being considered for dependent visual approaches.
- Will fall under Simultaneous Operations to Intersecting Runways (SOIA) program.

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Descending breakouts

OK, so now we know where PRM is going. We know about ATC's headaches in making this thing work. But what about the problems for us as pilots? Number one on the hit list of PRM objections for pilots (myself included) is the so-called "descending breakout." The problem faced by the controllers is a need to keep airplanes from hitting each other and the descending breakout was an early solution to that problem. Unfortunately, this is a maneuver which makes most of us shake our heads in disgust and just say "no."

That refusal is born of intelligence, professionalism, training, and a good old sense of self-preservation. After all, who among us wants to break off a night approach, in the stuff, at low altitude, and point our airplane at the ground (all the while knowing another airplane is zooming by somewhere within half a mile or so of us)? It is, and will always be, a scary thought. In fact, this was one of the primary reasons that our Safety chairman originally refused to allow the Company to implement this program on our property.

The good news is that ALPA and the FAA have come to an agreement that should all but preclude a descending breakout ever being issued. In the rare event that a descending breakout is necessary, ALPA has set up a system that will initiate an automatic investigation including ASRs, tower tapes, radar tapes, etc. We have made it very difficult for ATC to use the descending breakout for "controller convenience." It is still there in their toolbox, however, but think of it as having a sign that says "break glass before using!" This is a last-ditch measure to prevent two airplanes from coming together.

MSP's Cindy Green was instrumental in designing the airspace system at MSP, where a great deal of effort was put into virtually eliminating descending breakouts. She has also been involved with PHL and other future sites. In fact, MSP FAA local directives discourage descending breakouts "except under emergency situations." She has assured us that the same design logic will be used in any future sites. Among other built-in protections, all aircraft on downwind are kept at a minimum of 1,000 feet above any aircraft on a monitored approach. Also, parallel aircraft are turned on the localizers at different points giving a minimum of 1,000 feet difference in altitude, helping to prevent TCAS RAs.

As it turns out, better separation is a definite benefit of this system. Basically, the radar is much faster and more accurate than old-style approach radars, and it gives controllers much more time to correct potential blunders. Since it gives one second updates vs. 10 seconds on older units, you are actually better protected than on approaches we're used to. In addition, each runway has its own controller and scope, positioned next to each other. The workload for them is much lower, and the automatic alerts provide excellent backups. In fact, normal approach radar does not give any conflict alerts to aircraft on approaches—a controller must spot any transgressions, using data that's 10 seconds old.

ALPA Air Safety is satisfied that this solution makes descending breakouts:

- Rarely if ever necessary, and
- Sufficiently complicated for the controllers to use so that it truly is a "means of last resort."

Some benefits of PRM approaches

So why do we want to even deal with all this? Well, to be honest, the FAA and the Company really want us to. In addition:

- PRM provides a competitive advantage for our company.
- It provides enhanced airport capacity—better for our customers.
- It will mean less holding, gate holds, ground stops, and metering (once the system is running at full capacity).
- Most importantly, the PRM radar gives so much more accurate and timely information that PRM is actually safer than normal, staggered ILS approaches.

Some of the PRM fights ALPA has already won

In one form or another, ALPA has been involved with this program since day one. Many of the procedures and standards applied to PRM approaches evolved directly at the insistence of ALPA, often over fierce resistance from the FAA and/or NATCA. Here are some (but by no means all) of ALPA's contributions to the program:

- National standards—no local "special procedures."
- All localizers tuned to CAT II standards and protection.
- Dual comm—anti-blocking on all approaches (clear channel communications).
- DME required on all approaches.
- Commitment by FAA to update AIM.
- Enhanced obstacle clearance limits.
- Resolution of numerous training issues.
- Requirement for automatic investigation of any descending breakouts issued, including radar and ATC tapes, controller interview, etc.

The current battles

There are a few more hurdles to leap before this program is running completely the way we'd like it. At least the "to-do" list is finally shorter than the "done" list! Mainly, the remaining issues are:

- TA/RA approval.
- ICAO standards (PRM and other similar systems are in the works for Europe, too).
- Various changes to Jeppesen "Attention All Users" page simplifying and clarifying the procedures.

What's next?

Now that we've pretty much resolved the descending breakout issue, the single biggest obstacle to US Airways pilots participating in PRM approaches is the TCAS TA/RA problem. Basically, the FAA says we must set our TCAS to TA only prior to a PRM approach. We see several problems with that, including loss of separation during radar failure, or busy crews not resetting TA/RA after a missed approach.

ALPA Air Safety's position is that TA/RA is definitely preferable to TA only, and we are standing firm on that. TCAS is our last line of defense, and we will not allow that defense to be degraded. Work is in progress to change the FAA's position, pending the delivery of data from ALPA National Engineering staff showing that the latest version of TCAS software (which we have) is compatible with the system. By the time you see this article, the FAA should have that data. The ball will then be in their court

Once this data has been accepted and approved by the FAA, you can expect an FOB telling you that we will begin participating in PRM approaches.

The bottom line

We left MSP with cautious enthusiasm. There are still a few details to be ironed out, but the system does work. Most importantly, safety is not compromised and is, in many ways, enhanced. Right now, the biggest obstacle to successful operations is the number of crews who can't (or won't) participate.

We will most likely be setting up some kind of in-house event review program to monitor PRM operations flown by our pilots. This will allow us to spot trends and hopefully correct any problems that come up as operations increase. Much of what we do here will be used to develop other closely-spaced approach programs in the future.

Considering the benefits of increased airport capacity and less holding and other delays, we on your Safety Committee feel comfortable in endorsing the program with our pilot group once the final TCAS issue is resolved. Next time you're doing your revisions, take a moment to look over the Jeppesen 11-0 "Attention All Users Of ILS Precision Runway Monitor" page for MSP. We don't see this thing very often, but we will in the future. Each new PRM-equipped airport will have a

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similar page. Keep in mind that pretty much everything you need to know about the procedure is on either this page or the ILS PRM approach plates. It's not that complicated, just different.

Change is never easy, but here's the deal, folks—PRM is coming soon to an airport near you. If we don't participate, we are hurting the growth and competitive abilities of our own company, as well as missing out on some new technology that truly can help the safety of our operations.

Please feel free to contact me by e-mail (RLPMail@Bayserve.net) or any member of your Central Air Safety Committee with any questions, concerns, or comments.

ALPA SECURITY Alert Bulletin 2000-2

SUBJECT: INFLIGHT ATTACKS ON FLIGHT CREWS

On March 16, 2000, a man described by friends as a well-respected professional breached the cockpit door of Alaska Airlines flight 259 while en route from Puerto Vallarta to San Francisco. His expressed intentions were to kill everyone and he made an effort to do so by grabbing at the throttles and attempting to take control of the airplane. Fortunately, several passengers left their seats and subdued the attacker, but not before he placed the lives of everyone onboard in jeopardy. On March 27, 2000, a similar event occurred on a Germania B-737 charter from Tenerife to Berlin. An attacking passenger assaulted the flight crew and grabbed at the aircraft's controls. The First Officer called for assistance on the PA system and four passengers tackled the perpetrator, who appeared to be drunk and deranged.

These two incidents and others point to a profoundly serious trend of escalating violence against the safety of flight by certain passengers. ALPA's National Security Committee is in the process of developing detailed guidance for pilots on how to manage these crises. The recommendations provided below are intended as an interim measure until such guidance is available.

RECOMMENDATIONS:

1.Recognize that every disruptive passenger has the potential to be a violent attacker, although most disruptive passengers' behavior will not exceed verbal abusiveness.

2.Flight crews should develop contingency plans for dealing with violent passengers. Inform the cabin crew of these plans during the initial crew briefing, time permitting, or during flight if necessary.

3.Ensure that the cabin crew notifies the flight crew immediately whenever a verbally abusive passenger behaves strangely, or appears drunk or deranged. If this behavior occurs before takeoff, return to the gate and disembark the passenger.

4.Recent incidents indicate that the potential for violence escalates when a verbally abusive passenger leaves his/her seat and refuses to return to it. Once this happens, the flight crew should be prepared to either (1) subdue the passenger (2) divert to the closest alternate or (3) perform a combination of both.

5.If a passenger refuses to take their seat, ask for law enforcement officers and/or other able-bodied passengers to assist in subduing the unruly passenger if necessary. Identification of such individuals may be done discreetly by flight attendants, or alternatively, by means of a PA announcement.

6.Subduing a passenger using other volunteer passengers has obvious risks. The captain should be confident that the risks associated with failure to subdue a passenger at least equal the risks involved in doing so before requesting such assistance. Members of the flight crew should manage and direct such efforts and become physically involved only as a last resort.

Captain Stephen Luckey
Chairman, National Security Committee
March 30, 2000