Problems with PDC Formats

In 1990, the Pre-Departure Clearance (PDC) program was introduced at a number of U.S. airports. This system allows pilots to obtain IFR clearances through aircraft ACARS (Aircraft Communication Addressing and Reporting System) display units prior to taxi. The program has reduced the volume of voice communications and related use of the Clearance Delivery frequency.

Not long after the launch of the PDC program, ASRS began receiving related incident reports. *ASRS Directline* first published an analysis of PDC issues in March 1993 (Issue #5). This analysis noted that confusing PDC formats were one of the leading problems reported. In almost half of the PDC incidents reviewed, a track or heading error resulted.

In December 1996, ASRS reviewed PDC incident reports to be included in the first ASRS Operational Issues Bulletin. Inconsistent PDC formats were again identified as a significant user issue. Both the *Directline* article and the Operational Issues Bulletin are available on the ASRS web site (http://asrs.arc.nasa.gov/publications/), under "Safety Publications."

Increase this past year in PDC-related reporting prompted ASRS to revisit PDC issues. A recent review of 71 relevant incident reports confirmed that a concern we first identified 16 years ago—**PDC formats**—is a recurrent problem for many pilots. Specifically, our recent review identified the following PDC format issues:

- **Listing of both filed and cleared routes**
- **Unclear or ambiguous routing formats**
- **Unnecessary route revisions (amendments)**

Listing of Both Filed and Cleared Routes

When pilots view a PDC on the ACARS CDU (Control Display Unit), current industry practice is to include the original filed route along with the ATC-cleared route on the PDC "page." For many pilots, the visual and mental tasks of sorting out which routing to fly are confusing.

An air carrier Captain described how confusing the appearance of both a filed and cleared routing can be:

■ *When calling ATC for a clearance via radio, and if cleared as filed, the controller states 'cleared as filed.' In contrast, PDC seems to present a jumbled mess of information. If "Cleared as Filed' was typed, then the pilot could simply refer to their release. If not cleared as filed, then the route should be shown on PDC and that would be a cue to the pilot that something is different compared to what is on the release. Instead, the filed route is shown on the PDC, sometimes* [shown] *completely, sometimes 'truncated....'*

Other ASRS reporters weighed in with similar observations and advice:

■ *One solution would be to only display the actual ATC clearance vs. showing both the filed and the change, or use plain English stating 'Change route to read.'...As long as two routings are printed on the PDC, the filed and the amended routing, someone will fly the wrong one.*

■ *...Have only the cleared routing show up in the PDC message...so there is less of a chance that a crew flies the unrevised route.*

■ *It seems counter-productive to continue to put the original route on the PDC page. By putting only the* [cleared] *route, there is not a' two-route' choice...*

After many years of operational experience with PDC's, most air carriers require that PDC's be printed and reviewed by both pilots prior to programming the navigation system. This procedure provides redundancy and ensures that both pilots agree on the cleared route.

In some cases, however, cockpit ACARS units may lack printers, and in these instances it is customary for the First Officer to copy the PDC from the screen, then brief the Captain prior to takeoff. This procedure is problematic for two reasons: it assumes the First Officer will copy the PDC correctly, and it also assumes the briefing of the Captain will be accurate.

A report filed by the Captain of a high-performance jet illustrates how an error chain can develop when the First Officer is solely responsible for route verification:

■ *Received clearance via PDC. PDC listed both filed route and cleared route. The Second In Command copied the filed route...Upon departure, Controller sent us direct to a fix that was not on our 'clearance.' A quick question cleared up the confusion...*

A procedural safety net for reviewing PDC's on screen was proposed by another reporter:

■ *There is a company check airman on the line who is proposing a great idea. That is, when the clearance briefing is made, the First Officer (or Captain) should call up the PDC screen and both pilots should simultaneously review it. That will give the redundancy we need to be able to catch routing or other errors....*

Unclear Routing Formats

Some PDC route revisions are depicted only by a small dash ("-") before and after the revision. The original filed route is printed on a separate line immediately below the revised clearance. The formatting of revised vs. filed routes is so subtle that revisions are sometimes missed even by vigilant pilots.

ASRS Alerts Issued in February 2009	
Subject of Alert	**No. of Alerts**
Aircraft or aircraft equipment	8
Airport facility or procedure	11
Chart, publication, or nav database	1
TOTAL	**20**

February 2009 Report Intake	
Air Carrier/Air Taxi Pilots	2366
General Aviation Pilots	797
Controllers	59
Cabin/Mechanics/Military/Other	391
TOTAL	**3613**

An air carrier First Officer provided an example of how a routing revision looks:

■ *PDC clearance is a very good thing, but when there is a difference in the filed route and a* [revised] *route...instead of just a line (-SEA.J90.MWH-), maybe make a more distinct annotation and do not have the filed route directly next to (below) the 'reroute.'*

An air carrier First Officer called for the use of words, rather than symbols, to indicate a revised routing:

■ *...Replace the* [amendment] *dashes with other phraseology such as 'Reroute'...*

Unnecessary Route Revisions (Amendments)

A pet peeve of some ASRS reporters is PDC's that contain apparent route revisions (amendments), when the amendment doesn't actually change the filed routing. We included an example of this in the March 2009 *CALLBACK* ("Clearance Clarity"). Here is an excerpt from that report:

■ *...I have many times encountered an ATC clearance problem that just simply does not have to exist. We are often given a clearance that reads something like, 'You are cleared direct ABCDE intersection, direct FGHIJ intersection, XXX VOR 123 degree radial to KLMNO intersection, then flight plan route.'...We are forced to dig out charts that we might not normally have out, then try to find the VOR in question and trace out the radial, only to find that the given radial is a direct route from FGHIJ to KLMNO. If we have the equipment to proceed direct to the first two intersections, we obviously have the equipment to proceed directly to the third. Why not just give us direct to all three? Why confuse the issue by throwing in a VOR and radial, when both are completely unnecessary and serve only to create confusion?*

A B737 Captain echoed this observation:

■ *Revised segments* [amendments] *on clearances are received often and are usually different verbiage to mean the same thing – usually adding a VOR on the airway that was not listed on the clearance, but would have been passed over anyway.*

ASRS obtained an actual example of a PDC with a confusing depiction of revised vs. filed routing. The PDC was for a Dallas-Fort Worth (DFW) RNAV SID. Here is

what the revised and filed clearances looked like to the flight crew:

```
******** REVISED SEGMENT ********
-SOLDO2 MEI-


******** FILED CLEARANCE ********
DFW SOLDO2 ELD MEI J4 MGM
DBN
```

The flight crew interpreted **MEI**- in the revised segment as "direct from SOLDO intersection to Meridian VOR." They were supposed to fly the Meridian *Transition* (the original filed route for aircraft inbound to the Atlanta area). Note that the revised segment of the PDC lacks a clear identifier for a Transition. The flight crew's interpretation error led to a track deviation that put them in the path of departures coming out of Atlanta.

A B-737 Captain offered this emphatic comment:

■ *Stop PDC's from giving amendments to fixes along the filed route of flight on the release.* ***Amendments should only occur if there is in fact a change of routing****...At best, it causes confusion and delays by having to confirm the exact fix the reroute takes you, only to find out it's part of the jetway. At worst, you deviate off course. (#786189)*

Summary of PDC Format Suggestions

The 71 ASRS reporters who provided recent feedback on PDC's made the following suggestions for improvement to PDC formats.

• Include only the cleared route on a PDC. Displaying both the filed and cleared routes presents a two-route choice that can result in FMC programming errors and track deviations.

• Make PDC revisions more visible by labeling them ("**REVISED ROUTING**") or showing revisions with asterisks (*****) or other eye-catching notation. If the filed route is displayed, do not put it directly below the revised route.

• Discontinue the ATC practice of amending the filed route of flight with fixes that do not represent an actual change of routing. It is time-consuming for pilots to verify that a routing "revision" does not change the filed route of flight. In some cases, pilot confusion may result in track deviations and loss of separation events.

352