GOVERNMENT/INDUSTRY AERONAUTICAL CHARTING FORUM 06-01

April 19 – 20, 2006

Recommendation Document

Subject: STAR Procedures and their Terminations

Background/Discussion: An Area of Concern has been brought to the Air Traffic Procedures Advisory Committee (ATPAC) regarding STAR procedures and their termination. Inconsistency is noted among "regular" procedures, as well as, between "regular" procedures and the newer RNAV procedures. Specifically related to their terminations and whether there are headings specified, and also whether there is a Lost Communication Procedure. Additional information is provided in the attached handout.

Recommendations: Based on the discussion, ATPAC recommends:
- Publishing headings should follow the terminus fix.
- All STARs should contain standard-formatted Lost Communication Procedure information boxes.
- Standard format for Lost Communications Procedures for STARs.

Comments: This recommendation affects IACC Specification 17, Flight Information Publication Standard Terminal Arrival (Star) Charts

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ATPAC UPDATE

AREA OF CONCERN 116-5

7/14/04
SAFETY: No

SUBJECT: Revision to STAR Order 7100.9D

DISCUSSION: STAR Order 7100.9D states; "*STARS Shall: Terminate at an initial approach fix for a standard instrument approach procedure or at a point in space defined by a fix or waypoint. An RNAV STAR shall terminate at a point from which radar vectors may be initiated.*" Also: "*For RNAV STARS that terminate at a point in space, annotate on the chart that radar vectors will be provided; e.g. expect radar vectors to final, and annotate the chart with the lost communication procedure if lost communications procedures differ from 14 CFR 91.185.*"

A review of any number of STARs reveals two common themes regarding the terminating fix. The procedure either ends at the terminus fix or ends at the terminus fix followed by a specified heading.

In the first example, it may be somewhat confusing as to what heading should be flown in the event ATC does not issue a heading upon crossing the terminus fix or if the aircraft has lost communications with ATC. Ask any number of pilots and you will get multiple interpretations. Anything from fly the inbound radial, enter the gold if depicted, or fly the default heading after crossing the fix.

The latter procedure is probably the most common and probably what ATC desires. However, would that be the case if the airplane had been vectored off the procedure and crossed the terminus fix from an angle that varied from the published lateral track? In this scenario it could be quite possible the default heading would direct the aircraft towards other arriving or departing aircraft.

Procedures that end with a specified heading prevent unpredictable flight tracks in the event of lost comm., blocked frequencies, and busy controllers. At a minimum, ALPA believes STARs should end with a specific heading.

Another point of contention is the lack of guidance in the event of lost communications. Most STARs are consistent with their verbiage – **"Expect** *vectors to final approach course."* Again, it is somewhat open to interpretation as to how the pilot chooses to proceed to the final approach course and at what point or time the pilot should commence this.

Statistically, lost comm. could be considered a rare occurrence with today's equipment. This is all the more reason for simplifying procedures for flight crews.

SEA has done an excellent job of terminating their conventional STARs with specific headings **and** depicting Lost Comm procedure information boxes on the chart. There is no question as to the steps the pilot should follow. The terrain at SEA probably dictated the need for specific headings and instructions. Wouldn't it be practical for this to be the standard for the STAR order?

Ideally, LAS has developed "automatic" lost comm. procedures on their RNAV STARs that terminate at an IAF. Three out of four arrivals actually **clear** the lost comm aircraft for the ILS. The pilot does not have to consider ETA or holding instructions. Simply fly the arrival, execute the approach, and land.

The fourth arrival does not terminate at an IAF, but it guides the airplane to within five miles of the airport on a base leg, giving the pilot two options – maintain VFR and land (since the airport will probably be in sight), or follow the lost comm. procedure if IMC.

As more and more RNAV STARs are designed and implemented, ALPA believes there will be a need for procedures to terminate at an IAF. Since this is not the case for most existing procedures, ALPA believes ATPAC should concentrate on addressing a simple approach to fixing the current problem with STAR terminus.

SUGGESTED ATPAC ACTION: That ATPAC review this issue and recommend the FAA revise the STAR Order to reflect more precise guidance regarding the terminus fix and lost communications. In doing this, the following safety benefits should be considered:

- ➢ Consistent charting
- ➢ Clear and consistent guidance to pilots at the terminus fix of the procedures
- ➢ Unambiguous lost communication direction
- ➢ Enhanced predictability for ATC in the event of blocked or lost communication after the terminus fix.

Specific recommendations are:

- ➢ Published headings should follow the terminus fix.
- ➢ Each facility should consider the most efficient heading to use at the terminus, based on traffic flow and runway usage.
- ➢ All STARs should contain standard formatted Lost Communication Procedure information boxes.

116—The ATO-R, RNP Program Office had the following comments on the committee's suggestions:

Published headings should follow the terminus fix.
    Design guidance provided to procedure specialist incorporates the use of a heading following the terminus fix. Consideration will be given in future revisions FAAO 7100.9D, Appendix 2-b-3 to require the use of a VM path terminator after the last waypoint for those procedures terminating at a point in space. The use of a VM path terminator would provide heading guidance from the coded database. Charting conventions currently support the depiction of the heading for VM legs.

Each facility should consider the most efficient heading to use at the terminus, based on traffic flow and runway usage.

    This guidance is included in FAAO 7100.9D, Appendix 5, as part of the design process. The inclusion the Lead Operator as part of the RNAV Implementation Working Group provides feedback on the procedure design and route flyability.

All STARs should contain standard formatted Lost Communication Procedure information boxes.

This recommendation if adopted, should be referred to the Aeronautical Charting Forum (ACF). As a collaborative working group including both FAA and industry experts, the ACF can make recommendations to charting specifications to ensure uniformity.

After discussing the AOC and considering the comments by the RNP Program Office, the committee made the following recommendation:

RECOMMENDATION #1:

Published headings should follow the terminus fix → The FAA draft a DCP for this part of the recommendation.

Each facility should consider the most efficient heading to use at the terminus, based on traffic flow and runway usage → The FAA review this part of the recommendation and take appropriate action.

All STARs should contain standard formatted Lost Communication Procedure information boxes → The FAA draft a DCP for this part of the recommendation and also advise the Aeronautical Charting Forum (ACF) of the committee's actions.

117—After discussion it was decided that this issue would be better addressed by the ACF. Chairman will write a letter to that effect. The ATPAC member on the ACF will provide a briefing at the next meeting.

118—Letter to ACF is being drafted. Update will be provided in April.

119—Letter written from Chairman to the Aviation Charting Forum. No reply was received. Expect update in Anchorage. Next ACF meeting is May 11-12, 2005.

120—No response received from ACF. Committee member also on ACF does not recall this issue being discussed at their May meeting. Update will be provided in October.

121—Update provided to group by Bill Hammett, AFS-420. He indicated that this action was not brought before the ACF.

Discussion by the group led to the conclusion that the action that ATPAC wanted was misunderstood. ACF should address the issue and that some ATPAC members would like to attend the meeting to discuss the issues. The request will be retransmitted to the ACF.

122—Due to time constraints this AOC was not covered at this meeting.

CURRENT STATUS: DEFERRED

MEETING 06-01: Mr. Brian Townsend, ALPA, submitted this issue and provided the following briefing. A Continental crew flying into Cleveland, Ohio brought this issue to the attention of the Air Traffic Procedures Advisory Committee (ATPAC) approximately three years ago. The group discussed several STAR procedures at Cleveland Hopkins Intl and Las Vegas McCarran Intl revealing two common themes regarding the terminating fix. The procedure either ends at the terminus fix or ends at the terminus fix followed by a specified heading. Without a published heading, it may be somewhat confusing as to what heading should be flown in the event ATC does not issue a heading upon crossing the terminus fix or if the aircraft has lost communications. This is a gray area for both the pilot and controllers. Procedures that end with a specified heading prevent unpredictable flight tracks in the event of lost communications, blocked frequencies, and busy controllers. ALPA recommendations are:

- STAR Order should reflect more precise guidance regarding the terminus fix and lost communications.
- Published headings should follow the terminus fix, if not tied to an instrument approach.
- Each facility should consider the most efficient heading to use at the terminus, based on airspace and terrain.
- All STARs should contain standard formatted Lost Communication Procedures information boxes to include specific guidance.
- Emphasis should be placed on the enhanced safety benefits of the proposed changes
  - Consistent charting
  - Clear and consistent guidance to pilots at the terminus fix of the procedure
  - Unambiguous lost communication direction
  - Enhanced predictability for ATC in the event of blocked or lost communication after the terminus fix.

The ATPAC recommendations:

- Published headings should follow the terminus fix.
- All STARs should contain standard-formatted Lost Communication Procedure information boxes.

Mr. Townsend inquired if the ACF supports establishing a standard format for Lost Communications Procedures for STARs. If so, what would that format look like? Mr. Townsend recommends the Jeppesen format that has been established at Las Vegas. Mr. Townsend requested ACF support for the ATPAC recommendations and requested the ACF to develop a Lost Communication format. ATPAC should coordinate the necessary changes to 7100.9 (and .65 if necessary) prior to implementation. Mr. John Moore, NACG, commented that from an ACF perspective you are asking the ACF participants to determine if a standard format for lost communications is required and if so what that format would be. The heading depiction would be part of the STAR order. The NACG currently depicts lost communications information on its procedures in a box. The information is not shown in a separate standalone box as on the Jeppesen procedures. Mr. Moore asked since the information is currently charted, what type of standardization is required? Mr. Townsend responded that the main thing is to insure that this information is published on all STAR procedures. Jeppesen and NACG both chart the lost communications procedures when it is sourced. Mr. Moore stated that the STAR order should be modified to indicate that lost communications procedures would be published on all procedures. Mr. Kevin Comstock, ALPA, commented that ATPAC requested that the issue be reviewed by the ACF. They are looking for ACF concurrence on the concept of adding the lost

communication procedures to all STAR procedures. Mr. Comstock suggested that Jeppesen and NACG provide current charting specifications and examples of current STAR procedures depicting the lost communication information. Changes to the STAR order will be submitted from the ATPAC. Mr. Moore agreed to provide an example of the lost communication procedures. Jeppesen and NACG will both use the same STAR procedure to show the minor differentiations between the two charts. For example on the Keatn Two Arrival at Cleveland Jeppesen charts a 340° heading on the chart while the NACG charts this information as part of the lost communication instructions. Mr. Townsend recommended that the NACG charts match the Jeppesen charts. He stated that narratives are great when you are on the ground but in the terminal environment you need an immediate picture. Mr. Moore commented that there seems to be support for the issue.   However, the issue will require internal coordination and coordination with Jeppesen. Mr. Danny Shelton, NGA/PVA requested that NGA be included in this coordination. The group continued to discuss STAR procedures and STARs servicing multiple airports. Mr. Townsend stated in the case of multiple airports, multiple lost communications notes would not be created. There will be only one general lost communication procedure note. Mr. Rush informed the group that this would not be an issue for RNAV STARs. The 7100.9 indicates that RNAV STARs are airport specific; they do not service multiple airports. In the future, as the conventional procedures are reissued they will become airport specific. Mr. Rush recapped the issue for the ACF participants stating: ATPAC is working the STAR order issue with Air Traffic. One issue for ACF consideration is the lost communication procedures on STARs. ATPAC is requesting that Jeppesen and NACG standardize the depiction of this information. They are also requesting that a heading be shown for procedures that don't end at the IAF. The heading will only be shown when the information is provided in the source documentation. Mr. Moore requested a reading of the order to determine if the depiction of the track heading is required on the chart. Mr. Secretan commented that the IACC Specifications would need to be modified. Charting differences could be attributed to individual compiler's application of existing specifications. Written guidance will need to be provided. The STAR Procedures briefing and the ATPAC Update are attached to these minutes. **ACTION:** MPOC, Jeppesen, NGA and the NACG.

Editor's note: After the ACF Mr. Kevin Comstock, ALPA, provided the following summary: The ATPAC recommendations were to remove the ambiguity/loop holes in the 7100.9D text that allow a STAR to end at a point in space without a heading and without charted lost comm procedures. Our AOC to ATPAC and the resultant ATPAC recommendation is intended to have ALL STARs that don't end at an IAF to end in a heading with charted lost comm procedures taking the aircraft to an approach or to the enroute structure, without exception. Other suggestions for revisions to the STAR Order are to:
1.   Require hard altitudes at each waypoint rather than expect altitudes. In no case should there be no altitude specified. Most STARs, conventional and RNAV, are being flown using an FMS now days and hard altitudes get coded in the database, saving heads down time and fat finger errors by pilots having to enter altitudes as is the case if expect altitudes are used. It is even worse when there is no altitude depicted at all because then the pilot has no knowledge of what altitudes will be issued until shortly before reaching the fix, resulting in less time to enter it into the FMS, more heads down time in the terminal area and increased chance for errors.
2.   Remove the textual descriptions of the procedure altogether and let the graphic stand on its own. Textual descriptions should no longer be published on the charts and notes that are still required should not be redundant with information in the graphical depiction.

MEETING 06-02: Mr. John Moore, NACG, provided a brief history of the issue. Mr. Brian Townsend, ALPA, based on a discussion with the ATPAC, submitted the issue. ATPAC was recommending that the STAR Order be modified to indicate that lost communications

procedures would be published on all procedures and for the ACF to examine the adequacy of lost communications specifications. Mr. Townsend was unable to attend the forum; however, the following group discussion followed. Ms. Valerie Watson, Cartographic Standards, reported that current IACC Specifications state that lost communication procedures will be shown in textual form if provided. The original recommendation from ATPAC was to provide lost communication procedures for all STARs in a standard format. Ms. Watson commented that lost communication procedures are not available for all STAR procedures. This requirement is part of the STAR Order and should be forwarded to Mr. Jim Arrighi. Ms. Watson informed the group that Mr. Townsend and Mr. Arrighi are working the issue outside of the ACF. Mr. Ted Thompson, Jeppesen, reported that Jeppesen depicts lost communication information graphically on their charts; however, the information is not coded in their database. Mr. Tom Schneider, AFS-420, asked if the revised STAR Order was disseminated for comment. Mr. Paul Ewing, ATO-R, responded that the order had not been sent out. Mr. Ewing agreed to get an update on the status of the Order. Mr. Eric Secretan, NACG, stated that part of the original recommendation was that published headings should follow the terminus fix. He questioned if this requirement was in the IACC specifications. Mr. Bill Hammett, AFS-420 ISI, responded that it would not need to be in the specifications. If the heading is provided on the procedure source documents it will be charted. The group discussed the ATPAC recommendation for standard formatting. The NACG and Jeppesen both chart this information when provided each using their own unique style. There have been no user complaints about the individual method of charting lost communication information therefore the differences will remain. The group agreed that this is not a charting issue, it is a policy issue. **ACTION:** NACG.

MEETING 07-01: Mr. John Moore, NACO, provided a brief history of the issue. Published headings should follow a terminus fix and if they're on the form NACO will chart them. STARs should contain standard formatted lost communication procedure information boxes. NACO and Jeppesen both have these but they are slightly different. There is no intent to standardize the two. A letter written to ATPAC Chair Wilson Riggan from the Co-Chair of the ACF, John Moore, stated that when headings are provided on procedure forms, they will be charted. Regarding a standard format for lost communication procedures, "both government and private charts provide lost comm procedure information in somewhat similar and yet unique manners. To our collective knowledge there have been no user concerns with either the government or the private chart formats, so the determination was made to keep them separate formats." The letter closed out the issue as far as the Charting Forum was concerned. Since this concern was submitted by the ATPAC and we have answered their concerns, Mr. Moore recommended closing the issue.

Mr. Brian Townsend's ALPA, reiterated that his intent was to encourage facilities, when possible, to provide specific guidelines as to what they want an aircraft to do in the event of lost communications. Mr. Moore noted that a new FAA Order 7100.9E covering STARs is in work and is expected to address the situation covering STAR terminations. Mr. Kevin Comstock, ALPA, commented that perhaps this issue is an arrival procedure design issue and it should be transferred over to the Instrument Procedures Group rather than remain a charting issue. ALPA should submit responses to the new STAR order, or submit a separate RD to the Instrument Procedures Group of the ACF.

The consensus was that this issue should be closed and another RD can be submitted by ALPA, as needed, to the IPG.
CLOSED.