

# GOVERNMENT/INDUSTRY AERONAUTICAL CHARTING FORUM 07-02 Charting Group

October 24-25, 2007

## RECOMMENDATION DOCUMENT

FAA Control # 07-02-198

**Subject: Use of charts to validate navigation database information.**

Charting does not support the requirements in AC 90-101, AC 90-96, JAA TGL-10, MMEL (PL-98, Navigation Databases, MMEL Code 34) or the 3 August 2006 NTAP containing guidance to operators and pilots on verification of the accuracy of navigation data in an expired navigation database. Use of a chart to validate the aeronautical (fix) data in an out-of-date navigation database may lead to a violation of FAR 91.503 (a) which states: "The pilot in command of an airplane shall ensure that the following flying equipment and aeronautical charts and **data**, in current and appropriate form, are accessible for each flight".

### **Background/Discussion:**

Issue #1: Determining AIRAC rollover time. The AIRAC rollover time varies between ICAO states and usually coincides with the low ebb of air traffic activity (in the small hours of the morning, local time). The AIRAC rollover or effective time for most countries is not published on charts e.g. Jeppesen does not publish the time for European countries, and the NGA HIIH2 Caribbean & South America states "US Airspace Effective 09012" but provides no times for other countries). Therefore, the applicability period is unknown to the pilot for many countries. If the pilot is unable to determine the effective time (as opposed to the date) the pilot can not determine whether the navigation database requires validation against charts.

Issue #2: Lack of geodetic information on chart to verify fix1NAVAID position. AC 90-101 and the 3 August NTAP state "Traditionally, this has been accomplished by verifying electronic data against paper products. One acceptable means is to compare aeronautical charts (new and old) to verify navigation fixes prior to departure". The above recommendation is acceptable provided fixes, NAVAIDS, or routes are not moved without changing their associated names. Current FAA guidance in 7400.2 and 8260.19 permits the movement of a fix by 5 NM without renaming the fix. 8260.19D Para 264, 11 (c) states: "When a fix is moved, the name must be changed if the fix is moved 5 NM or more unless operational requirements dictate otherwise". A 5 NM fix movement is incompatible with the transition to a performance based NAS and is not in conformance with ICAO Amendment 45 to Annex 11 (Air Traffic Services), Appendix 2, which states "When there is a need to relocate a significant point, a new name code designator shall be chosen".

Many SID, STAR and IAP charts do not show the latitude/longitude of the waypoints or NAVAIDS. Some en route charts do not show the latitude and longitude of associated fixes and NAVAIDS. Because of chart scale it becomes difficult, if not impossible, for a pilot to determine if a fix has been moved by comparing charts or referencing the navigation database without the publication of latitude and longitude on these charts. (This paper *does not advocate charting latitude and longitude but does recommend that fixes and NAVAIDS should not be moved without renaming*).

It should be recognized that changes in latitude and longitude e.g. due to a more accurate survey may be acceptable. The distance any fix or NAVAID is moved without changing its name must be consistent with the underlying navigation performance tolerance associated with that fix or NAVAID.

Issue #3: Verifying if a chart has been amended. The 3 August 2006 NTAP and AC 90-101 state: "If an amended chart is published for the procedure, the database must not be used to conduct the operation". Determining if a chart has been amended is not possible overseas and requires carrying a complete set of old and new chart publications in the USA. Since the procedures in the

FMS navigation database are not identified by amendment the pilot is unable to verify the amendment number of the procedure in the navigation database against the chart. In the U.S. NACO, NGA and Jeppesen provide the amendment number as shown below. However, since the navigation database does not store or display the amendment number associated with a procedure the pilot can not verify the chart against the procedure.

To determine whether a procedure has changed the pilot would have to carry and reference the previous set of charts against the current set of charts. Only if the pilot noted for example that the procedure had changed from **Amend 4** to **Amend 5** would the pilot have reason to believe the database procedure was possibly no longer accurate. For overseas locations the pilot can not readily determine if the chart has been amended. The "PANS OPS 3 or 4" on the Jeppesen charts below refers to holding speed and acceleration criteria respectively, and does not relate to any procedure amendment. The "CHANGES label highlights changes to the chart (not necessarily the procedure) and may state: "New format", "minimums", "Missed apch", "None", etc. To a pilot it is not intuitively obvious if the change impacts the ARINC **424** coding in the FMS navigation database. In the example below it is not necessarily evident whether "Apt & rwy elev" means the procedure has been amended and should not be flown using the expired database.

### **Summary**

In order to comply with FAA ACs and the NTAP or European guidance material either charts require significant medication **or** FAA policy should conform to ICAO guidance and prohibit the movement of a fix/NAVAID without it's renaming. The Air Line Pilots Association recommends that charts remain unchanged and that FAA guidance on fix/NAVAID movement be amended. In summary, pilots cannot: Consistently determine the AIRAC rollover time from charts. Can not verify the latitude/longitude of many fixes on charts. Therefore, they cannot determine if the out-of-date database latitude/longitude is correct. Can not easily determine if an amendment to a chart has been issued overseas Can not determine if an amendment to a chart has been issued in the U.S. without carrying and cross comparing the in cycle and preceding publication.

**Recommendations:** Amend **FAA** Orders on fix movement (tolerance) so that current charts can support **FAA** and European guidance material issued to pilots.

### **Comments:**

**Submitted by:** Pedro Rivas

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**Date:** 31 August 2007

**MEETING 07-02:** Pedro Rivas, ALPA, briefed that according to regulations (FAR 91.503), charts are to be used to validate navigation database information. However, charting practices do not support the requirement and it's impossible to comply with current regulations.

Factors include: Loading problems (new database not loaded due to problems, lack of availability) and AIRAC rollover cycle (aircraft may be off station, in flight, or in transit during rollover).

Problems include:

1. Determining AIRAC rollover time
2. Lack of lat-long information on charts to determine navaid/fix position.
3. Verifying a chart has been amended.

Recommendation: Amend FAA Orders on airspace fix movement (tolerance) so that current charts can support FAA and European guidance material issued to pilots.

ICAO rules state that anytime a fix is moved, a name change is in order. Mr. Tom Schneider, AFS-420, said the FAA's rule is 5 NM. That distance comes from changes in criteria marrying IAP fixes with the 5 NM standard for NAVAID moves. Mr. Schneider also noted that there was no ICAO standard Amendment 44 to Annex 11 regarding renaming significant points which are moved when the FAA adopted the 5 NM standard. Amendment 45 is effective November 2007.

Controllers and pilots have grown accustomed to certain fix names and don't want them to change regularly.

ALPA is not recommending that a minor change in geodetic position due to a more accurate survey should mandate a name change e.g. new survey or recalculation of position by only 20 feet.

ALPA believes that fix name changes should be consistent with the underlying navigation performance requirement associated with that fix, e.g. the tolerance associated with the movement of an enroute navaid is greater than the tolerance associated with the movement of a waypoint on an RNP approach.

ALPA recommends that other significant fix attributes which change a path and that cannot be readily checked using a chart against an FMS or GPS database should also be examined as a requirement for a name change, e.g. fly-by to fly-over.

ALPA is not recommending that flight with an out-of-date database should be permitted other than temporarily for flights during the AIRAC rollover period, or to allow an aircraft to be positioned to a location where the current database can be loaded.

ALPA is not necessarily endorsing changes to charts.

Mark Steinbicker and Pedro Rivas will coordinate and discuss the issue at the PARC.

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**MEETING 08-01:** Active project is in work. This issue will require some time to address. The first telecom took place on April 14<sup>th</sup> and the next one is scheduled for May 5<sup>th</sup>.

**ACTION:** Mr Pedro Rivas will report status at the next ACF.

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**MEETING 08-02:** Mr. Pedro Rivas, ALPA, briefed the issue to the ACF.

FAR 911.503 (a) states: "The pilot in command of an airplane shall ensure that the following flying equipment and aeronautical charts and data, in current and appropriate form, are accessible for each flight at the pilot station of the airplane."

(See attachment # 6 – Navigation DATA Currency WG.pdf)

The briefing focused on a proposal developed by the NDCWG to add "procedure amendment number dates" to instrument approach charts to aid pilots in determining chart and database procedure coding currency.

Based on the NDCWG's earlier telecons, the group decided to focus attention on terminal procedures, starting in the U.S., to develop a foundation for a potential solution

that might work on a global basis. Enroute issues would be address later in 2009. It was generally agreed that Mr. Rivas would need to seek ICAO endorsement, as ICAO does not provide a “procedure amendment number dates” (version) system.

The proposed solution to the issue focused on charting the procedure effective date in addition to the Julian date on all IAPs. A discussion of the difficulties involved with P-NOTAMs ensued and Ms. Valerie Watson, FAA/NACO and Mr. Greg Yamamoto, FAA/NACO, agreed to take up this issue with Mr. Rivas offline to work out any details. It was determined to keep the issue on the agenda until the next ACF.

**ACTION:** NACO to coordinate internally between AVN and IAP branch prior to contacting Mr. Rivas.

**ACTION:** Mr. Pedro Rivas, ALPA will report status at the next ACF.

**MEETING 09-01:** Mr. Bill Hammett, FAA/AFS Contract Support, commented that the FAA is ready to implement the establishment of the procedure amendment date by assigning the reference date (i.e. in the Transmittal Letter).

Mr. Ted Thompson, Jeppesen, remarked that his company will support the proposal and that they have informed the ACF Navigational Digital Display Working Group (NDDWG) that Jeppesen will need at least 90 days prior to implementation in order to prepare specifications, modifying internal processes, and to prepare bulletins to inform OEMs and customers of the change and pilot obligations for checking out-of-date databases. Pilots must be informed how to use the new, charted date. NACO will prepare a website note and a note for the TPP.

A new date is expensive to implement as far as the database is concerned. Mr. Lance Christian, NGA, admitted that it was a good solution but expressed hesitation and concerns about the costs verses benefits of implementing the proposal. He further added that flying RNAV as the only available procedure in IMC conditions with an outdated database was probably a rare occurrence. He said, if a pilot cannot validate his database, then perhaps he should fly by conventional navigation, or perhaps changing the database validation regulation to simply state that a pilot can't use an outdated database as a primary means of navigation, would be a better option. He also pointed out that if the expense is too costly to implement, DoD would have to non-concur with the IACC RD. Mr. Ted Thompson, Jeppesen, was convinced that this fix is necessary. The way it stands now, pilots have no chance to comply with the regulation. Mr. Geoffrey Waterman, NGA, suggested we put the information elsewhere electronically. Mr. Hammett, responded that the printed dates would be to help civilian pilots. A tentative NDDWG teleconference date is set for May 19<sup>th</sup>. Mr. John Moore, FAA/NACO, urged persons with concerns to participate in the telecon. Details have yet to be confirmed by Mr. Pedro Rivas, ALPA.

**ACTION:** Valerie Watson will report on the status at next ACF meeting.

**ACTION:** Mr. Pedro Rivas, ALPA, will report status at the next ACF.

**MEETING 09-02:** Ms. Valerie Watson, FAA/AeroNav Services, reported that the specification had been signed to implement the “procedure reference date” and will take effect beginning October 22, 2009 for all original and amended IAPs. An explanatory chart notice will be issued and AIM changes will be submitted by Flight Standards.

**CLOSED**