GOVERNMENT/INDUSTRY AERONAUTICAL CHARTING FORUM
Instrument Procedures Group
October 23-24, 2001
HISTORY RECORD

FAA Control # 01-02-235

Subject: Harmonization of RNAV DP's

Background/Discussion:

FAA Order 8260.44A contains criteria for Level One (RNP-1), Level Two (RNP-2) and Level 3 (RNP 0.3) procedures. ARINC 424 specifications currently do not discriminate between any of them.

Not all aircraft equipped with multi-sensor FMS also have Inertial Reference Systems. Many business and regional aircraft are flying with FMS that meet AC 20-130A and TSO-C129-B1 or –C1, but do not have IRS.

In an area of sparse NAVAID coverage, FMS that utilize only DME/DME and GPS updating may not be able to provide adequate navigation guidance if GPS is unavailable. Perhaps because the TSO's were written well prior to Order 8260.44A, these -B1 and -C1 FMS do not provide alerting for loss of GPS while on the ground.

These characteristics of procedures and avionics systems raise the possibility that a pilot could select a Level One RNAV DP and take off from a mountain canyon airport – unaware that the FMS will be unable to navigate.

Recommendations:

1. Develop guidance for pilots that provides explanations of which RNAV equipment is suitable for flying each classification of RNAV DP. The guidance should describe appropriate pilot actions for updating of FMS position and/or verification of GPS signal availability.

2. Revise ARINC 424 specifications to include appropriate support of all Levels of RNP planned for implementation by FAA and ICAO.

Comments: This recommendation affects a large percentage of turbine-powered business aircraft as well as regional airliners.

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Initial Discussion (Meeting 01-02): Dave Sheehan presented the issue on behalf of NBAA. NBAA is concerned that the FAA has criteria published in Order 8260.44, *Civil Use of RNAV DPs*, for Level 1 (RNP-1), Level 2 (RNP-2), and Level 3 (RNP-0.3), yet ARINC 424 specifications do not discriminate between any of them. This failure to integrate procedure design and avionics systems raises the possibility that pilots could select a procedure that a FMS will be unable to navigate. Dave recommends that FAA develop guidance for pilots to explain which RNAV equipment is suitable for each level DP and that ARINC specifications include support of all levels of RNP planned for implementation. Norm LeFevre, AFS-420 stated that AIR is supposed to write a bulletin addressing this issue. Norm took the IOU to follow up the issue with AIR and report back to the ACG. He also recommended that NBAA take the issue directly to ARINC. Dave agreed to do so. ACTION: AFS-420 and NBAA.

MEETING 02-01: Steve Bergner, NBAA, recapped the issue stating that his organization did brief the issue at ARINC. The bottom line is that pilots need to know who can fly what. Norm LeFevre, AFS-420, briefed that his research indicates that there is no FAA/AIR guidance in work. Jim Terpstra, Jeppesen, briefed a proposal for ARINC 424 RNP specifications. ARINC 424-17 will include guidance that RNP values for every leg be indicated to the pilot. Norm LeFevre, AFS-420, will continue to follow up the issue with AIR-130 and report back to the ACF. ACTION: AFS-420.

MEETING 02-02: Tom Schneider, AFS-420, briefed that his office believes this is primarily an AVR (certification) and AFS-410 (operations) issue. Vince Chirasello addressed the issue on behalf of AFS-410 and presented a briefing on recent situations regarding aircraft not flying repeatable tracks due to different avionics and actions taken thus far to address these problems. The problems mainly involve airlines using inertial navigation and DME/DME RNAV. There is no current requirement for a DME assessment before flying the procedures, ergo, DME aircraft could not be guaranteed containment. Initial proposals to establish "quick alignment" waypoints proved unsuccessful. Analysis revealed that inertial systems could be as much as .8 NM in error after 5 minutes of update and up to 4 NM in error after 30 minutes of update. A temporary solution was to use radar vectors initially, then RNAV. As a result, Air Traffic has suspended publication of all new RNAV DPs and STARs and is currently re-assessing currently published procedures. A lengthy NOTAM has been issued; the text of which was discussed at length. Vince briefed that 8 current procedures are NOTAMed "NA", 42 procedures are covered by other NOTAM restrictions, and 32 procedures are specified for GPS only. The wording of "XXX CRITICAL DME" or "XXX DME REQUIRED" was also discussed and it was the group consensus that the use of "REQUIRED DME" was the more appropriate term as this annotation is currently in use on procedure charts. Brad Alberts, ALPA, questioned how aircrews could be held responsible for verifying information they don't have and can't get; e.g., must crews continually monitor DME Identifications, etc. As a result of the discussion, Hooper Harris, AFS-410, agreed to further address the issue. AFS-410 agreed to: 1) edit the NTAP entry as soon as possible; 2) issue clarification to POIs through regional AWOs; and, 3) continue to develop AIM resolution of the issue. ACTION: AFS-410.

MEETING 03-01: Rich Gastrich briefed that this issue is being addressed through the RNAV Action Team (RAT). AFS-410 has submitted the AIM change for August publication, updated the NTAP entry, and provided guidance to POIs. Steve Bergner, NBAA, expressed concern that multi-sensor equipped aircraft may not be aware that the required sensors are unavailable prior to departure. This could place aircraft in a perilous position if departing in poor weather in an obstacle-rich environment. Steve suggests that there be a mandatory ground GPS availability assessment prior to departure. Rich agreed to take Steve's concerns back to AFS-410 for evaluation. ACTION: AFS-410.

MEETING 03-02: Bill Hammett, AFS-420 (ISI), briefed that AFS-410 has revised AIM paragraph 5-2-6f to explain the two levels of RNAV departure. The change was published on August 7th. AFS-410 believes that this should close the issue and suggested that the ground pre-departure GPS system check be worked within the RNAV Action Team (RAT). Steve Bergner, NBAA, non-concurred with closing the issue. Steve emphasized that the pre-departure GPS availability check is vital to prevent aircraft from departing when GPS integrity may not be acceptable for at least the first 30 NM of flight. Steve recommended that AFS-410 remain the focal point for this issue for the ACF regardless of which other groups are involved in resolution and the group agreed. ACTION: AFS-410.

MEETING 04-01: Mark Steinbicker, AFS-410, briefed that a number of AIM changes have been published, but the issue is too big to fix via the AIM alone. AC 90-US RNAV, which is under development, will harmonize procedure design criteria, avionics certification, and pilot procedures. If GPS is required for a DP, the pilot must complete an availability check prior to using the procedure. AFS-410 does not intend to issue guidance on how the pilot is to accomplish the check; that will be left up to the operator. All are aware that there are avionics systems that are not operationally suited to specific procedures. In response to industry's feedback of "...don't tell us how to fly our airplanes…", FAA has decided to leave the responsibility for determining procedure applicability with the pilot. Steve Bergner agreed that with the on going work with AC 90-US RNAV, the issue could be closed.
Issue Closed.
