GOVERNMENT/INDUSTRY AERONAUTICAL CHARTING FORUM
INSTRUMENT PROCEDURES SUBGROUP
MEETING 97-1 WASHINGTON, DC
APRIL 7-8, 1997

1. **Opening Remarks**:

Mr. Paul Best, AFS-420, and Mr. Dick Powell, ATA-100, Co-chairs of the Aeronautical Charting Forum (ACF), Instrument Procedures Subgroup, opened the meeting at 1:00 PM on April 7, 1997. The meeting was held at the National Ocean Survey (NOS) Headquarters and welcoming comments were made by Capt. Terry Laydon, Acting Director of Aeronautical Charting and Cartography. A listing of attendees is attached.

2. **Review of Minutes of Last Meeting**:

Minutes of the last meeting (ACF 96-2), which was held on October 7-8, 1996, were mailed on November 21. No comments were received and the minutes were accepted as distributed.

3. Old Business:

a. **92-02-102:** IFR Departure Procedures and Standard Instrument Departures (SIDs). Basic IFR Departures Should Follow the Least Onerous Obstacle Route (95-01-142).

(1) Since the last meeting, an ad hoc group consisting of representatives of AFS, AAT and AVN met and drafted an order (8260.PID) to combine IFR Departure Procedures and SIDs under a new title "Published Instrument Departures (PIDs). The proposed Order was briefed by Bill Mosley (ATO-120) who noted that the new method will completely revise the development, processing and charting of IFR departures, bringing them under the Flight Standards policy regime vice Air Traffic. The benefits include, but are not limited to standardized criteria, reduced development/processing time, charting of complex procedures and a better interface between procedure specialists and controllers. His target date for publication of the Order is August 1997. A lively discussion ensued with the following issues raised:

Pilot education material needs to be addressed and AIM/AIP changes prepared - Tom Young (ALPA).

There should be standard complexity criteria for required charting, not left to analyst opinion - Steve Hickok (HAI).

We should consider the international impact before we get too far along in eliminating the SID acronym and adopting PID - Bill Hammett (AFS-420).

Any required cartographic changes must be staffed through IACC - Dalia Marin (NOS).

The revised Form 8260-15 must be charting friendly - Wally Roberts (ALPA).

Differentiation between an ATC altitude restriction vs. an obstacle clearance altitude should be addressed in the Order - Charlie Guy (ASAP).

The rule making aspects of departure procedures must be checked through AGC - Jim Nixon (AFS-440).

(2) No action was taken to address ALPA concerns over the disparity between SIDs vs. Standard IFR Departure procedures at Santa Barbara, Monterey and San Francisco airports. Air Traffic felt that the new PID Order would provide a resolution. Wally Roberts (ALPA) stressed that these procedures need to be looked at now as coordination time for a new Order could be considerable despite projected timelines. Bill Mosley (ATO-120) and Terry Deplois (AVN-160) took the previous IOU to jointly coordinate with LAX FPO and AWP-530 to resolve specific ALPA concerns at the aforementioned airports. Wally Roberts (ALPA) will provide necessary input.

Status: (1) AFS-440 will circulate draft Order 8260.PID for comment. Item Open (AFS-440).

(2) ATO-120 and AVN-160 will jointly work to resolve specific ALPA SID vs. IFR Departure minimum concerns. Item Open (AT0-120 and AVN-160).

b. **92-02-103:** Minimum Crossing Altitudes on Obstacle Clearance SIDs.

Tom Young (ALPA) researched the NASA ASRS data base and discovered there were 16 filings on departures, 5 of which related to the subject. Discussion indicates that there is still no consensus on this issue. ATC says "trust us to provide obstruction clearance"; pilots say "we do, but would like obstruction information on the charts". Bill Hammett (AFS-420) noted that the SID legend in the IAP booklets denote that an asterisk (*) may be used to denote a MOCA. Additionally, military SIDs use different icons to denote differences between ATC and minimum climb rates. As noted in Issue 92-02-102, Charlie Guy (ASAP) emphasized that this issue should be addressed in the proposed 8260.PID Order. Pat Fair (ATA-130) and Bill Mosley (ATO-120) took an IOU to check IACC specifications and report at the next meeting

Status: ATA-130 and ATO-120 will research the IACC specifications to determine charting applicability for MOCAs on SIDs. Item Open (ATA-130 and ATO-120).

c. **92-02-104**: TERPS paragraph 323a; Precipitous Terrain Additives.

Don Pate (AFS-450) presented a briefing on the FAA's on-going study of this issue. He noted that the National Center for Atmospheric Research (NCAR) had responded to the FAA's request to develop a general model, with accompanying software, that could be applied to an approach to a specific runway. Certain parameters such as wind and terrain characteristics along the approach would be specified and the model would identify if an adjustment is necessary and the amount of ROC increase needed. The FAA Weather IPT has indicated that, based on current commitments, the project will be added to the 1999 budget. Steve Hickok (HAI) noted that helicopters should be included in the study. Details of Don's briefing are contained in the attached status document. Terry Deplois (AVN-160) briefed current AVN policy to get user input on precipitous terrain activity in the interim. He also stated that the ROC has been doubled on the VOR/DME RWY 15 IAP at Bradley, CT as a result of the November 1995 American Airlines MD-83 landing accident. The revised IAP is scheduled for publication on May 22.

Status: AFS-450 will continue to track the issue and provide periodic reports. Item Open (AFS-450).

d. **92-02-105**: Review Adequacy of TERPS Circling Approach Maneuvering Areas and Circling at Airports with High Heights Above Airports (HAAs).

Don Pate (AFS-450) presented a status document updating FAA study efforts thus far. The Aircraft Simulation and Analysis for TERPS (ASAT) software has been upgraded and the circling model is in final development. As previously noted, industry inputs on circling techniques for various circling maneuvers would aid in completion of the model. Tom Young (ALPA) stated that his organization will provide inputs during a scheduled April meeting with AFS-440/450 in Oklahoma City. Don stated that he hopes to have graphic depictions of test results vs. current criteria for presentation at the next meeting. Details of Don's briefing are contained in the attached status document.

Status: AFS-450 will complete ASAT modeling/testing and report the results at the next meeting. Item Open (AFS-450).

e. **92-02-110**: Cold Station Altimeter Settings.

Jim Nixon (AFS-440) briefed that criteria development is progressing, albeit slowly. He noted that the impact on BARO-VNAV must now be addressed. Areas of concern are the possibility of a requirement for dual minimums and the impact on VDPs and descent angles. Jim stated that he hopes to have criteria development completed by the end of the year.

Status: AFS-440 will continue criteria development. Item Open (AFS-440).

f. **93-01-121:** Provision of Current IAP Procedural Directive Guidance to the Aviation Community.

Paul Best (AFS-420) briefed that AC90-XX was being circulated within FAA headquarters. All comments received from the circulation with members of the charting forum have been considered in this final version. Funds from the GPS office will not be available for the update to include the TAA and FMS procedures. Hopefully, funds may be available from an existing contract in Flight Standards to include these items. After this final coordination, the AC will go to printing. Jim Nixon (AFS-440) briefed that coordination with AFS-600 indicated that they hope to have the new AC61-27 published by the end of the year.

Status: AFS-420 will continue the publication process for AC90-XX. AFS-440 will continue to track the status of AC61-27. Item Open (AFS-420/440).

g. **94-02-133**, SIAP Optimum Final Approach Segment Descent Gradient for Categories C and D Aircraft.

The ATA representative working this issue resigned; therefore, a status briefing from the ATA Chart and Data Display Working group was not available. Jim Nixon (AFS-440) briefed that TERPS Change 17 contains improved criteria for a visual segment obstacle analysis. General consensus among those that have reviewed the draft criteria is that it is good and will close this issue when published. The change should be out for formal coordination within the next month.

Jim Terpstra (Jeppesen) presented updated Jeppesen charts depicting various VNAV charting proposals. Bill Hammett (AFS-420) questioned if VNAV angles greater than VASI/PAPI angles, as indicated on the charts, could cause cockpit confusion. If flown as depicted, aircrews will break out of weather with high visual indications. Additionally, the VNAV path will place the aircrew at MDA after the VDP if one is charted. While not a critical issue, it deserves consideration. Also see Issue 96-02-170.

Status: AFS-440 will continue to process TERPS Change 17 for publication. Item Open (AFS-440).

h. **95-01-140**: Sector Arrival Zones for GPS SIAPs and Turning Protection Over Such Fixes.

Jack Corman (AFS-440) briefed that the basic 'T' IAP design and the TAA concept is continuing to develop. He stated that a draft order (8260.TAA) specifying TAA design criteria will be circulated for formal comments soon. TAA guidance is now published in the AIM. There is still discussion on controlled airspace issues, especially in the Western 15 states. As there was no APOA representative at the meeting, the consolidated APOA position on the TAA and controlled airspace was not available. Hopefully, this will be provided at the next meeting. Bill Mosley again noted that if the local community is not in agreement with a standard "T" approach design with an associated TAA, then a standard "I" approach design with conventional transitions from the en route structure would be the order of the day.

Status: (1) AFS-440 will continue to track the TAA program and provide status reports until implemented. Item Open (AFS-440).

(2) Bill Hammett will ensure that AOPA is reminded of their IOU for a consolidated AOPA position on the TAA and controlled airspace issues prior to the next meeting. Item Open (AFS-420/AOPA).

i. **95-01-141**: Multiple DME ARC IAFs.

Jim Nixon (AFS-440) briefed that this subject is still in work. Draft criteria is now approximately 90% completed. Charting specifications need to be reviewed to ensure there is no conflict.

Status: AFS-440 will continue working the issue and provide periodic updates. Item Open (AFS-440).

j. **95-01-143**: Establish and Publish Procedural Maximum Speeds for Terminal Instrument Procedures.

Don Pate (AFS-450) briefed FAA analysis results thus far. His staff has concluded that the existing Procedure Turn (PT) area will only accommodate a maximum airspeed of 200 Kts through 6000 MSL in extreme adverse wind conditions. Above 6000 MSL, the area will only accommodate airspeeds up to 165 Kts (See the attached status report for further details). The question was put to the forum as to the direction to proceed. Wally Roberts (ALPA) recommended specifying a 200 Kt maximum airspeed as an immediate safety improvement pending completion of the study. If additional airspace must be consumed, then publish the maximum speed on the chart to maintain containment. The group consensus favors a two phased approach: First, publish pilot guidance restricting airspeed to 200 Kts for PT maneuvers as an interim safety measure (documents include the AIM, AIP, IAP booklets and the Instrument Flying Handbook). Bill Hammett (AFS-420) and Wally Roberts (ALPA) will jointly take on this task. Second, AFS-450 will continue assessing the airspace required for PTs above 6000 MSL and make a determination whether or not new criteria development is warranted.

Status: (1) AFS-420/ALPA will prepare a change for the AIM/AIP. Item Open (AFS-420/ALPA).

(2) AFS-450 will continue testing and report progress at the next meeting. Item Open (AFS-450).

k. **96-01-155:** Operational Status for OROCA Use.

Bill Mosley (ATO-120) reported that there has been no further progress on this issue pending resolution of the supplemental navigation status of GPS.

Status: ATO-110/120 will continue to work the issue and report at the next meeting. Item Open ATO-(110/120).

l. **96-01-156:** Along Track Distance (ATD) Error Assumption in GPS SIAP Criteria.

Don Pate (AFS-450) presented a briefing paper on this issue. Research and coordination with Dr. Young Lee (MITRE), who is a recognized expert on RAIM and GPS integrity issues, indicate that using GPS for en route navigation on existing airways will not compromise obstruction clearance. Errors associated with GPS fix positioning are considerably less than those associated with conventional NAVAIDs. AFS-450 will continue to consult with Dr. Lee to arrive at a final solution that can be used to revise Order 8260.38A. The consensus was that this issue can be closed.

Status: Item Closed.

m. **96-01-159:** Specified Ceiling Requirement for High HAA/HAT MDAs.

Discussion led by Wally Roberts (ALPA). ALPA believes that a ceiling should be required for all IAPs that have a HAA/HAT of 700' or greater. The premise is that approaches with such high minimums must also have high obstructions in the final/circling areas that must be seen and avoided once leaving the MDA. Requiring a ceiling for the approach will enhance safety. Jim Nixon (AFS-440) noted that this would require a chance to the CFRs. Wally noted that as long as the requirement was on the 8260 form, Part 97 would be satisfied. Maj. Mike Miller (AFFSA) noted that the USAF currently only requires visibility to conduct an approach, but is re-visiting the ceiling and visibility requirement. Rudy Ruana (Jeppesen) noted that this is an issue currently being addressed by the JAA and the JAA position should be considered before making U.S. policy changes. Jim Nixon (AFS-440) asked if applying this requirement at Part 139 airports would satisfy ALPA's concerns. The response was yes. AFS-420 will research this issue through legal and try to get AOPA and NBAA inputs for the next meeting.

Status: AFS-420 will coordinate with AOPA, NBAA and AGC for input and discussion at the next meeting. Item Open (AFS-420).

n. **96-01-162:** GPS NoPT Terminal Routes and PT Required terminal Routes.

Discussion led by Paul Best (AFS-420). It is the FAA position that the current guidance provided in the AIM is sufficient. Paul also provided ALPA a draft of the AFS response to their previous letter on this issue. Wally Roberts (ALPA) requested guidance be published in the Instrument Flying Handbook. Paul agreed and Jim Nixon (AFS-440) took the IOU to work this through AFS-600. Once published, the issue may be closed.

Status: AFS-440 will work with AFS-600 in getting guidance published in the Instrument Flying Handbook. Item Open (AFS-440).

o. **96-01-163:** Purpose of ILS Fix Inside the Precision FAF.

Paul Best coordinated with ARM and determined that the change to Part 91.175(k) has been written. He has a verbal agreement that they will increase the priority on processing this rule change.

Status: AFS-420 will continue to track the status of the CFR change and brief at the next meeting. Item Open (AFS-420).

p. **96-01-165:** Radar or DME fixes on SIAPs.

Jim Nixon (AFS-440) stated that the guidance in Order 8260.19C and criteria in TERPS, paragraph 161 are satisfactory. This, coupled with increased quality control by AVN-160 resolves the issue.

Status: Item Closed.

q. **96-01-166:** Determining Descent Point on Flyby Waypoints (Originally: Definition of "On Course").

Don Pate (AFS-450) briefed that a telcon was held on March 14 to discuss this issue. Representatives of AFS-440, AFS-450 and ALPA participated. The discussion transcended to "when may descent begin on flyby waypoints". ALPA took an IOU to prepare a paper on defining "on course" for ACF 97-1; however, it was not presented. This issue will be a subject of discussion at a scheduled meeting between ALPA and AFS-440/450 on April 25. It was agreed to change the Issue title to Read: "Determining Descent Point on Flyby Waypoints". It was suggested that AFS-410 be a part of the solution.

Status: AFS-450 to continue working the issue and report results of the April 25 meeting at the next ACF. Item Open (AFS-450).

r. **96-02-170:** Visibility/RVR Issues in VNAV/RNAV IAPs.

This issue was discussed in conjunction with Issue 94-02-133. There seems to be disagreement within the ATA working group over mandating a missed approach at the VDP. The program is alive, but in flux. Ben Rich (APA) emphasized that under current rules, the MDA must remain inviolable. Tom Young (ALPA) stated that they had no problem with the concept of using a MDA as a DH provided there was an accompanying obstruction analysis; i.e., an underlying ILS, PAPI, VASI or charted VDP. General consensus is that the proposed criteria in TERPS Change 17 provides a good visual segment obstacle assessment. Jim Enias (AFS-410) stated that AFS-1 has made the policy decision to support VNAV enhancements for non-precision approaches. He expanded to state that an Order containing the requisite criteria for air carriers to be authorized to use a MDAs as a DA (similar to reaching DH on a precision approach), in a VNAV environment, is being coordinated within FAA. Jim noted that initial application will be via tailored charts. MAP-to-THLD distance as it relates to required visibility was also discussed. Wally Roberts (ALPA) stated that TERPS Table 6 should be corrected to bring Category C visibility requirements in line with a 300 Ft/NM descent gradient (same as Cat D).

Status: (1) AFS-410 will continue to track this issue and oversee cleanup of existing IAPs for air carrier VNAV use. Item Open (AFS-410).

(2) AFS-440 will evaluate TERPS Table 6 for possible change. Item Open (AFS-440)

s. **96-02-171:** Temporary vs. Permanent FDC NOTAMs.

Jim Nixon (AFS-440) stated that they were still working methods of expediting changes to IAPs.

Status: AFS-440 will report on progress at the next meeting. Item Open (AFS-440).

4. New Agenda Items:

a. Paul Best (AFS-420), as co-chair, requested agenda time to discuss and get feedback on a NTSB recommendation from the Cali accident to annotate "RADAR NOT AVAILABLE" on charts at those locations without radar service. Based on the information available, the general consensus of the group is that the recommendation is without merit. Pilots should never assume that radar service is available. Ben Rich (APA/AA) briefed that all American aircrews are extensively briefed that all operations outside the U.S., especially in South America, should be considered to be in a non radar environment. Paul thanked all for their input and will consult further with the NTSB to determine the exact thrust of the recommendation. Discussion item only.

b. **97-01-173:** STAR/Missed Approach Procedures @ DFW.

Prior to the meeting, Bill Hammett (AFS-420) suggested to ALPA that the problems associated with the DFW Metroplex Project appeared to be Air Traffic issues and perhaps should have been addressed first to the Air Traffic Division at the Southwest Region Headquarters, then at ATPAC. Tom Young (ALPA) briefed the issue was being brought before the ACF because of an inability to achieve a positive response from the regional office. Ben Rich (APA/AA) briefed the problems in detail (2 STARs through parachute jump areas, DME readings from other than the primary NAVAID, missed approach holding fixes outside of the en route environment, etc.) and stated that the issue would be addressed at ATPAC. It was agreed to give ATPAC a chance at resolving the problem; if there is no satisfaction, it will be returned to the ACF.

Status: Issue will be referred to ATPAC. Item Closed.

c. **97-01-174:** AVN-100 Letter re: FPO/Pilot Interface.

Discussion led by Tom Young (ALPA) noting that AVN-100 had sent a letter to user groups advertising regional FPO telephone numbers. The objective is to have line pilot input concerning problems associated with SIAPs. ALPA believes that this information should be published in the AIM. Terry Deplois noted that the impact on FPO workload in getting calls from all pilots as opposed to receiving consolidated input from user groups must be considered.

Status: AVN-160 will staff the issue with AVN-100 and report at the next meeting. Item Open (AVN-160).

d. **97-01-175:** Pilot Duties to Confirm GPS Database.

Discussion led by Wally Roberts (ALPA). ALPA believes that the FAA needs to clearly define the responsibility of the pilot in flying GPS IAPs from a manufactured database. Jim Enias (AFS-410) stated that there is an AFS-200 bulletin stating that flight crews are responsible for verifying databases. The intent was for the crew to accomplish a reasonableness check to validate that charted points match databases, not to verify geographic coordinates. Database integrity is not an issue due to checks and balances in the ARINC and RTCA documentation.

Status: AFS-410 took the IOU to create a FSIB through AFS-200 on this issue. Jim Terpstra (Jeppesen) agreed to publish this as a briefing bulletin when completed. (Item Open (AFS-410).

e. **97-01-176:** NoPT Considerations in GPS IAPs With Course Reversal.

Wally Roberts (ALPA) presented the issue paper noting ALPA concerns that AVN-100 procedure designers were not taking full advantage of the capabilities of GPS in designing NoPT routes. Terry Deplois (AVN-160) expressed agreement and stated that internal QC initiatives should resolve the problem.

Status: Item Closed.

f. **97-01-177:** Non-collocated DME Use at/inside FAF.

Position paper presented by Wally Roberts (ALPA). ALPA believes that FAA is abusing the TERPS criteria in routinely designing IAPs with a non-collocated DME source vice only "where a unique operational requirement exists". Industry policy, supported by AFS-200, is that both air carrier pilots must display the primary NAVAID from the FAF inbound. Jim Terpstra (Jeppesen) volunteered to check their data base to determine the number of approaches with this design. This will indicate the magnitude of the problem. Paul Best (AFS-420) will in turn forward the list to Airways Facilities for F&E.

Status: Jeppesen will report results of their data base study AFS-420 who will forward it to AF for F&E. Item Open (Jeppesen/AFS-420).

g. **97-01-178:** JFK VOR RWY 13L/R Waivers/LDIN Lights.

Position paper presented by Tom Young (ALPA). Key issue is contradiction between the Pilot/Controller Glossary which lists LDIN lights as an approach light system, whereas the TERPS Order lists them as a VFR aid. Discussion also centered on the value of LDIN lights in IFR and VFR arenas. Wally Roberts (ALPA) has done some research in this arena and provided a draft of a proposed letter to AFS-420/440. A copy is attached. Jim Nixon (AFS-440) will research the issue and ensure applicable documents are in agreement.

Status: AFS-440 will research applicable directives and ensure continuity. Item Open (AFS-440).

h. **97-01-179:** Operational Problems with Charted Visual Flight Procedures (CVFP).

Issue paper presented by Tom Young (ALPA) relating to design problems with CVFP at LAX. Bill Hammett (AFS-420) noted that the CVFP program was under the purview of Air Traffic (Order 7100.79C). He suggested that this issue be addressed through ATPAC first, then, if there is no success, bring it before the ACF. ALPA agreed to pursue this process.

Status: Item Closed.

i. **97-01-180:** Charting Complex IFR Departure Procedures.

Tom Young (ALPA) stated that they would defer this issue, pending the results of draft Order 8260.PID.

Status: Item Closed.

j. **97-01-181:** Non-precision Missed Approach Turns.

Issue paper presented by Wally Roberts (ALPA). It is ALPA's opinion that any non-precision IAP that has a HAT/HAA of 400' or greater need not have a straight ahead segment when an immediate turn could provide obstruction relief and lower minima. Additionally, all non precision IAPs with a HAA/HAT of less than 400' should have a straight climb segment prior to any turns greater than 15∞. The consensus of the group that this issue warrants consideration.

Status: AFS-440 will take the IOU for this issue and report at the next meeting. Item Open (AFS-440).

k. **97-01-182:** Charted Fixes on SIAPs w/o Purpose.

Issue paper presented by Wally Roberts (ALPA). The VOR or GPS RWY 6 IAP at Napa, CA has a fix (DYKEE) charted in the plan view that has no apparent use. Discussion revealed that this fix is the alternate missed approach fix and it is not published on any other chart. Alternate missed approach instructions are not charted, but issued by ATC when necessary. Having the fix, and its associated makeup on the IAP chart provides pilots with a visual depiction of the fix and negates the necessity of ATC having to verbally issue the navigation system make up of the fix or detailed holding instructions if necessary. ALPA prefers a separate section of the IAP booklet be devoted to alternate non radar missed approach instructions. This may impact on charting specs.

Status: AFS-440 and ATA-130 will jointly review the issue and report at the next meeting. Item Open (AFS-440/ATA-130).

l. **97-01-183:** VDPs on SIAPs w/Part Time Altimeter.

Issue paper presented by Wally Roberts (ALPA). ALPA's position is that a VDP should be on every IAP that meets obstruction clearance criteria. Jim Nixon (AFS-440) noted that on part-time altimeter IAPs, this would require two VDPs which could present a human factors issue. Paul Best (AFS-420) noted that perhaps a note could resolve the charting of dual VDPs "...use xxx altimeter and change VDP to x.x DME".

Status: AFS-400 will consider the issue and report at the next meeting. Item Open (AFS-410/420/440/450).

m. **97-01-184:** Clarity of Missed Approach Verbiage.

Issue paper presented by Wally Roberts (ALPA). ALPA believes that the language used for the missed approach text used by some AVN-100 procedure specialists is sometimes ambiguous. It was felt by FAA that the example quoted was an anomaly; however, AFS-440 and AVN-160 will jointly review current guidance to ensure that it is adequate. Terry Deplois (AVN-160) stated that he will emphasize quality control in this area.

Status: AFS-440 and AVN-160 will jointly review current the guidance in Order 8260.19C. Item Open (AFS-440/AVN-160)

5. Next Meeting: The next meeting is tentatively scheduled for the month of October, 1997. Specific date/time/location will be forwarded by letter. Please note the attached OPI listing for action items.

6. Attachments:

a. Attendance listing.
b. Status Document, 92-02-104, Precipitous Terrain.
c. Status Document, 92-02-105, Circling Areas.
d. Status Document, 95-01-143, Maximum Airspeed.
e. 97-01-178, ALPA Draft Letter on LDIN Lights
f. OPI Listing.

ACF 97-1 INSTRUMENT PROCEDURES SUBGROUP

NAME		AGENCY	PHONE/FAX	E-MAIL
Dick Powell		FAA ATA-100	202-267-9308 FAX: 5322	dick.powell@faa.dot.gov
Paul Best		FAA AFS-420	202-267-8277 FAX: 5086	paul.best@faa.dot.gov
Bill Hammett		FAA AFS-420	202-267-8724 FAX: 5086	william.hammett@faa.dot.gov
Don Pate		FAA AFS-450	405-954-4164 FAX: 2528	don.pate@faa.dot.gov
Jim Nixon		FAA AFS-440	405-954-5904 FAX:4809	james.nixon@faa.dot.gov
Jack Corman		FAA AFS-440	405-954-0012 FAX:4809	jack.corman@faa.dot.gov
Jim Enias	**	FAA AFS-410	405-954-4208 FAX:5086	james.enias@faa.dot.gov
Dave Catey	**	FAA AFS-200	405-954-8094	
Terry Deplois		FAA AVN-160	405-954-0188 FAX: 4236	terry.deplois@faa.dot.gov
Bill Mosley		FAA ATO-120	202-267-7824 FAX: 5817	bill.mosley@.faa.dot.gov
Pat Fair		FAA ATA-130	202-267-9290 FAX: 5532	pat.fair@faa.dot.gov
Jim Terpstra	**	Jeppesen	303-784-4401 FAX: 4111	jimterps@jeppesen.com
Rudy Ruana		Jeppesen	202-331-7727 FAX: 296-0278	rruana@jeppesen.com
Mike Dugan	**	ATA	202-626-4011 FAX:4149	mdugan@air-transport.org
Ben Rich		APA/AA	703-569-8768 FAX: 2232	dcasafety@aol.com
Tom Young		ALPA	360-687-5904 FAX: 5093	70774.1335@compuserve.com
Wally Roberts		ALPA	714-498-3456 FAX: 0000	wally@terps.com
Kevin Comstock		ALPA	703-689-4176 FAX: 4370	73714.74@compuserve.com
Tom Schneider		AFFSA/XOIP	301-981-6701 FAX: 7996	schneidert@emh.aon.af.mil
Maj. Mike Wilson		AFFSA	301-981-2118 FAX: 7996	wilsonm@emh.aon.af.mil
Dalia L. Marin		NOS	301-713-2925 FAX: 1271	dalia.marin@noaa.gov
Bill Parshall		USAASA	703-806-4417 FAX: 4409	parshallw@belvoir.army.mil
Charles Guy		ASAP	540-636-4835 FAX:4835	asap@rma.edu
Dick Johnson	**	NAVFIG	202-433-3473 FAX: 3458	
Dan Norman		STI	423-681-6137 FAX: 9157	stigps@aol.com
Scott DiBiasio		HAI	703-683-4646 FAX: 4745	scott.dibiasio@rotor.com
Tom Grove		NASAO	301-495-2848 FAX: 585-1803	tgrove@nasao.org

* Monday only

** Tuesday only

GOVERNMENT/INDUSTRY CHARTING FORUM
STATUS DOCUMENT
FAA CONTROL #92-02-104

SUBJECT: Precipitous Terrain Definition and Required Adjustment.

BACKGROUND: Current criteria contained in TERPS (paragraph 323. a.) does not clearly define precipitous terrain nor specify any particular adjustment to MDA's for precipitous terrain, but leaves these decisions solely in the hands of the procedure designers. The NTSB has recommended that the FAA develop a clear definition for precipitous terrain and an associated adjustment to MDA's for precipitous terrain so that procedure designers will consistently provide adequate protection in areas of precipitous terrain.

DISCUSSION:

The National Center for Atmospheric Research (NCAR) has responded to our request for a proposal to develop a general model, with accompanying software, that could be applied to an approach to a specified runway. Certain parameters, such as wind and terrain characteristics along the approach would be specified and the model would identify if an adjustment is necessary and the amount of ROC that would need to be increased.

The objectives of the NCAR proposal are:

o Develop a model that would determine if the characteristics of precipitous terrain were present.

o Develop a model that would determine the required increase in obstacle clearance when precipitous terrain conditions exist.

o Develop software that could be used by the procedure designers to determine if precipitous terrain conditions exist and calculate the increased ROC.

The proposal suggests development in the following five tasks:

Task 1. *Development of empirical dependencies of windshear, turbulence, and pressure deviations or orography and atmospheric conditions near complex terrain by using qualitative physical analysis (QPA).* This task includes:

- Substantiated choice of basic physical assumptions.
- Verification of these assumptions when possible.
- Estimation and choice of the primary governing parameters.
- Derivation of the functional dependencies for the parameters under analysis (windshear, turbulence, pressure deviations).

Task 2. *Development of definition of the precipitous terrain.* This task includes:

- Rough estimation of empirical constants and functions in the functional dependencies from Task 1 based on published literature.
- Development of an empirical model of required increase in terrain clearance on orography and atmospheric conditions.
- Development of criteria (thresholds) for the terrain to be categorized as precipitous on the basis of windshear and turbulence levels, and pressure deviations.
- Applying the above criteria to the model to define precipitous terrain.

Task 3. *Tuning of the empirical model.* This task includes:

- Additional analysis of the LANTEX field project (Hong Kong, 1994).
- Additional analysis of the Colorado Springs field project (COS, February - March, 1997).
- Additional analysis of the Juneau field project (Juneau, 1997).
- Adjustment of constants and functions in the empirical model in accordance with results of the above analyses.

Task 4. *Verification of the model.* This task includes:

- Analysis of the data set from the flight check aircraft.
- Statistical comparison of the flight data with model predictions for windshear, turbulence, and pressure deviations.
- Design of a questionnaire for the expert estimates.
- Obtaining filled out questionnaires.
- Statistical analysis of the expert estimates.

Task 5. *Refinement of the empirical model.* This task includes:

- Modification of the model based on the verification results from Task 4.
- Numerical modeling of idealized flows at extreme atmospheric conditions.
- Analysis of the numerical modeling results.
- Modification of the model based on the numerical modeling analysis results.
- Analysis of new relevant observations.
- Modification of the empirical model based on an analysis of new observations.

STATUS: . The proposal provided by NCAR has been evaluated and appears to address the requirements for procedure design. The FAA Weather IPT has indicated that, based on current commitments, the project will be added to the 1999 budget.

GOVERNMENT/INDUSTRY CHARTING FORUM
STATUS DOCUMENT

FAA Control # 92-02-105

Prepared by: Steve Jackson, AFS-450

SUBJECT

Circling Maneuvers at Airports with high heights above airports. This issue shares common concerns and problems with 92-2-104, TERPS Precipitous Terrain Additives. Another relevant issue is 92-02-110, Cold Weather Altimeter Error.

BACKGROUND

This issue was originally submitted by ALPA. Four sub-issues were raised within this and the two similar issues (92-2-105 and 92-2-100): 1) Airports with high elevations; 2) Airports with very high surrounding terrain; 3) Circling at night with high terrain; and 4) Inadequate area to maneuver within the circling area to a safe descent to the runway from high terrain clearance circling MDA. At the last Charting Forum, several issues were raised by an AFS-450 paper, and assumptions for constructing a model were discussed.

DISCUSSION

Additional searches have been made of FAA and other publications for likely techniques that a pilot would use to execute a circling approach. These were evaluated to try and determine which ones would produce the most dispersion of the tracks with reasonable winds during the circling maneuver. This information was used to begin construction of a circling model. Due to the many additional variables added by performing a visual maneuver rather than an instrument maneuver this model is considerably more complicated to construct than our existing computer simulations. One major factor is that the pilot should be making visual corrections to the runway, where in an instrument environment the wind drift while flying a heading would be uncorrected in most cases. How the pilot corrects in the final turn is also much more complicated than in an instrument environment, where no correction would be made on a turn to a heading. These factors must be included in order to produce realistic over/under-shoots based on variable winds and pilot over/under correction.

The ASAT model itself has been upgraded. The aerodynamic and propulsion models have passed all Boeing tests. The autopilot and flight control system models are nearing completion. This will add much greater fidelity to the testing and accurately model the characteristics of the actual aircraft.

The circling model is still in final development. It presently will fly an approach to one end of the runway and circle to the opposite end, with varying winds. Variations in pilot timing, heading and bank angle have been incorporated. The pilot visual correction in the turn to final has proven to be difficult to model, but should be completed shortly. More

pilot visual corrections will have to be included in order to make a realistic assessment. However, turn diameters generated with various winds indicate the need to continue to pursue the model.

As previously requested, inputs from industry on circling techniques for various circling maneuvers would aid in the completion of the model. The simplest form of input is probably diagrams illustrating the techniques for flying circling from the opposite end of the runway and 90° to the runway to include the following: turn points, bank angles, timing techniques, drift correction, length of straight segment on final, offset from the runway (distance and the course change/timing used to achieve it), how to determine the start of the turn to final (timing, visual angle, etc.), configuration/ configuration change points, airspeeds and rate of change (Knots per second), earliest point descent to the runway should start.

If necessary, a meeting could be arranged in Oklahoma City to discuss circling techniques and practices.

STATUS

Some refinement has been added to the model as well as the ASAT simulation. Additional refinement is required prior to making any recommendations on the need for changes to the circling areas. Recent upgrades to the ASAT model, and acceptance by Boeing, will give higher fidelity simulation when the model is completed. Inputs from industry on techniques for flying circling approaches would increase the accuracy of the model and help speed completion.

COMMENT

Please send any circling technique inputs to:

Steve Jackson
FAA/MMAC/AFS-450
P.O. Box 25082
Oklahoma City, OK 73125

For questions or additional comments call, 405/954-6899.
E-mail: Steve_E_Jackson@mmacmail.jccbi.gov

GOVERNMENT/INDUSTRY CHARTING FORUM
STATUS DOCUMENT

FAA Control # 95-01-143

Prepared by: Steve Jackson, AFS-450

SUBJECT

Establish and Publish Procedural Maximum Speeds for Terminal Instrument Procedures.

BACKGROUND

Wally Roberts, ALPA, led the discussion noting that the maximum airspeed for each segment of instrument approaches should be specified. ALPA's greatest concern was turns over the IAF from the en route structure. The discussion was expanded to include procedure turn maneuvers and maximum airspeeds for various type course reversals. ALPA also desires that the holding and teardrop course reversal maneuvers not be allowed. They believe that aircraft should be required to track outbound on the reciprocal of the inbound course then make a 45/180, 80/260, or 90/270 course reversal. None of the other participants were in favor of eliminating the holding and teardrop maneuvers. AFS-450 agreed to conduct ASAT modeling to determine maximum airspeeds and evaluate various course reversals against the TERPS procedure turn area. ALPA later forwarded to AFS-450 a specific example of a location where they felt the protected airspace might not be adequate at high entry airspeeds.

DISCUSSION

An initial, limited modeling effort gave the capability to look at a fixed bank entry turn back towards the inbound course. The altitude, airspeed, wind speed, wind direction and the aircraft heading relative to the entry course could be evaluated in a very time consuming and cumbersome manner. The initial test confirmed the ALPA simulator conclusion using Livingston, MT that with a precise set of entry parameters it is possible to exit the protected airspace, and is worst case scenario for entry heading and inbound course relationship.

More capabilities were added to the model to allow further evaluation. The ability to have multiple variations of several individual parameters to be accomplished on one run. This allows quicker modeling of multiple entry headings, multiple wind directions effect on a given entry heading, and multiple wind speeds on a given entry. It also allows a graphic comparison at the results of these multiple variations. Test cases at various airspeeds and altitudes were run with this revised model.

Since the last meeting, most of the advancement in the modeling has been in improving the fidelity of the aircraft model. For our 727 and 747 ASAT models, Boeing has approved the aerodynamic and propulsion characteristics and they have passed all tests to Boeing's satisfaction. The autopilot and flight control systems are still undergoing some changes. Modeling of holding pattern entries has been very recently been completed and will be

applied to evaluating complete holding type procedure turns. We are planning to do a limited look at procedure turns in a simulator to compare the results with the ASAT model.

Additional discussion and modeling was done at various altitudes with the holding pattern airspeeds. In trying to stay with the altitude structure for holding patterns, modeling was done at 6000'/200 KIAS and 14,000'/230 and 210 KIAS. The bank angle was nominally 25° with slight variations. With the TERPS wind velocities of 53 Knots at 6000', the worst case combination entry geometry and wind just touches the primary area boundry. At 14000'/210 KIAS and a 65 Knot wind, the worst combination geometry is tangent to the secondary boundry. Winds above 65 Knots with the worst combination could place the aircraft outside the secondary area. At 14,000'/230 KIAS, 65 Knot winds two of the entries exit the secondary.

Assuming that the desire is to keep all entries inside the primary area with the TERPS wind value, approximately 165 KIAS at 14,000' with the worst case geometry and 65 Knot wind would be the maximum entry airspeed. All entries are contained in the primary area and all but two of the modeled entries are more than a mile from the boundry. Entries with winds over 100 KIAS with the worst geometry and wind direction are contained within the secondary.

While this speed appears to be workable for containment, the question of all aircraft being able to fly approaches at this speed at this altitude needs to be answered. Some of the questions are:

1. Since the aircraft is slowing for an approach and should be beginning configuration during the procedure turn would this speed be overly restrictive?

2. If the aircraft had to take a turn in holding prior to the PT could it be accomplished at this speed?

An additional problem with having different speeds at different altitudes is, how does the pilot determine which airspeed to use, since the maximum altitude to start the procedure turn is not published? (Also, what altitude does the procedure designer switch templates?) The only published number is generally the procedure turn completion altitude, which may be well below the altitude the approach is started from. If the airspeed is based on the last assigned altitude there might have to be a maximum altitude to commence the approach. ATC would have to get the aircraft to that altitude prior to the procedure turn fix.

There are three possible solutions to prevent exiting the protected airspace:

1. Reduce the maximum airspeed for procedure turns to remain within the present procedure turn template. AIM already specifies that maximum holding pattern airspeeds apply to holding in lieu of procedure turns. Applying holding speeds to procedures turns

6000’ and below appears to be viable. Procedure turns above 6000’ appear to need lower airspeeds than holding if the area is not enlarged. The primary area of the number 10 holding template for 14,000’, is larger than the primary area of the PT template, and includes most of the PT secondary area in the entry area. Above 6000’, lower airspeeds should not be as much of an impact for procedure turns as they are for holding, since the aircraft is configuring for the approach and will have to continue to slow down anyway. The net result is probably to cause high speed aircraft to slow a few miles earlier, just prior to the procedure turn fix rather than after it, .

2. Use the present PT template and 200KIAS at or below 6000’ and increase the size of the procedure turn template above 6000’ to accommodate 210 or even 230 KIAS. This could result in increases in the minimum descent altitude or even in the elimination of some approaches. The primary PT area for 210 KIAS would be approximately the same size as the present secondary area. The time required to implement a revision of all of the existing procedure turn approaches above 6000’ with a new template size could be considerable but the number of approaches involved is unknown at this time. With GPS scheduled to eliminate procedure turns, this is may not be a viable option.

3. Use the present PT template and 200 KIAS at or below 6000’ and replace procedure turns with holding-pattern-in-lieu-of-procedure-turn type approaches above 6000’. Again the time required to implement could be considerable and a different template shape and size could result in MDA increases or elimination of some approaches. The amount of descent allowed in a Hold-in-lieu is less than in a procedure turn and many of the approaches that would be most affected might not be possible.

STATUS

Additional modeling and software revisions have been completed. Entry speeds have been evaluated at various altitudes, wind speeds, and directions through the entry turn. Near term expansion of the model’s capabilities will allow evaluation of the entire procedure turn with intercepting the outbound, teardrop and holding type entry maneuvers as well as provide more refinements and ensure there are no problems outside the entry phase of the procedure turn.

COMMENTS

Analysis of higher speed military aircraft must be considered.

TO: LYLE WINK, AFS-440 PAUL BEST, AFS-420

FROM: WALLY ROBERTS, ALPA'S CHIPS COMMITTEE, 2/28/97

Gentlemen:

I have come up with the following in my research on approach light systems. It appears to me that not only are the JFK LDIN lights not an approach light system within any reasonable definition of the standard, they don't even come close to meeting the spacing requirements that are generally accepted for lead in light systems.

I would appreciate any insights you can provide either me, Tom Young, or our staff engineers, Bob Hall and Kevin Comstock, on the rationale behind adding LDINs to the Pilot/Controller Glossary's definition of approach light systems.

The following is the only authoritative information I can find in FAA publications pertaining to what constitutes a bonafide approach light system. The principal document is Advisory Circular 150/5300-13, "Airport Design":

AC 150/5300-13 - AIRPORT DESIGN

Chapter 6. SITE REQUIREMENTS FOR NAVAID AND ATC FACILITIES
600. GENERAL.

This chapter presents siting and clearing requirements for the navigational aids (NAVAID) and air traffic control (ATC) facilities which influence airport planning. The information is not readily available in other FAA Advisory Circulars. It is provided to minimize conflicts between NAVAIDs and ATC facilities and other airport developments. Figure 6-2 depicts the usual location of these NAVAIDs and ATC facilities on a typical airport.

CAUTION: The guidance herein is not in sufficient detail to be used to design or install a NAVAID or ATC facility.

a. Limitations. Siting and clearing criteria is representative of the ideal situation. It is advisable to contact the appropriate FAA regional office before planning any NAVAID or ATC facility.

b. Federal NAVAID and ATC Programs. Information on eligibility for FAA-installed NAVAIDs and ATC facilities or other FAA assistance programs can be obtained from an FAA regional office. FAA policy governing NAVAID and ATC facility relocations is found in AC 6030.1, FAA Policy on Facility Relocations Occasioned by Airport Improvements or Changes. {See AC 150/5300-7B - Ed.}

c. Non-Federal NAVAIDs. FAA policy concerning the establishment of instrument procedures using non-Federal NAVAIDs is found in 14 CFR Part 171, Non-Federal Navigation Facilities.

d. Jet Blast/Exhaust. NAVAIDs, monitoring devices, and equipment shelters should be located at least 300 feet (90 m) behind the source of jet blast to minimize the accumulation of exhaust deposits on antennas.

605. APPROACH LIGHTING SYSTEMS.

All approach lighting systems (ALS) are configurations of lights positioned symmetrically along the extended runway centerline. They begin at the runway threshold and extend towards the approach. An ALS augments the electronic navigational aids. Guidance on ALS systems is found in AC 150/5340-14. [emphasis added]

a. ALS Configurations. The FAA recognizes four ALS configurations to meet visual requirements for precision and nonprecision approaches.

(1) A ALSF-2 is a 2,400 foot (720 m) high intensity ALS with sequenced flashing lights. It is required for CAT II and CAT III precision approaches.

(2) A MALSR is a 2,400 foot (720 m) medium intensity ALS with runway alignment indicator lights (RAILs). It is an economy ALS system approved for CAT I precision approaches. The MALS portion of the system is 1,400 feet (420 m) in length. The RAIL portion extends outward an additional 1,000 feet (300 m).

(3) A MALS is a 1,400 foot (420 m) medium intensity ALS. It enhances nonprecision instrument and night visual approaches.

(4) A MALSF is a medium intensity ALS identical to the MALS above except that sequenced flashing lights are added to the outer three light bars. The sequenced flashing lights improve pilot recognition of the ALS when there are distracting lights in the airport vicinity.

b. Land Requirements. An ALS requires a site centered on the extended runway centerline. It is 400 feet (120 m) wide. It starts at the threshold and extends 200 feet (60 m) beyond the outermost light of the ALS.

c. Clearance Requirements. A clear line of sight is required between approaching aircraft and all lights in an ALS.

606. OMNIDIRECTIONAL APPROACH LIGHTING SYSTEMS.

An omnidirectional approach lighting system (ODALS) may be installed on a runway with a nonprecision approach or on a runway that is difficult to identify due to an excessive number of lights in the area.

a. ODALS Configuration. ODALS consists of seven capacitor discharge lights. Five of the seven lights are sequence flashing omnidirectional lights. These five are located on the extended runway centerline, beginning 300 feet (90 m) from the runway threshold and spaced at 300-foot (90 m) intervals. The remaining two lights are located on either side of the runway threshold.

b. Land Requirements. ODALS require a site centered on the extended runway centerline. It is 400 feet (120 m) wide. It starts at the threshold and extends 1,700 feet (510 m).

c. Clearance Requirements. A clear line of sight is required between approaching aircraft and all lights in an ODALS.

607. LEAD-IN LIGHTING SYSTEMS.

Lead-in lights (LDIN) consist of at least three flashing lights installed at or near ground level to define the desired course to an ALS or to a runway threshold. (emphasis added)

a. LDIN Configuration. Each LDIN installation is unique. An LDIN is designed to overcome problems associated with hazardous terrain, obstructions, noise sensitive areas, etc. LDIN systems may be curved, straight, or a combination thereof. The lights are placed on the desired approach path, beginning at a point within visual range of the final approach. Generally the lights are spaced at 3,000-foot (900 m) intervals. [emphasis added]

b. Land Requirements. Sufficient land or property interest to permit installation and operation of the lights, together with the right to keep the lights visible to approaching aircraft, is required.

c. Clearance Requirements. A clear line of sight is required between approaching aircraft and the next light ahead of the aircraft.

ALPA COMMENT: The foregoing AC language appears to make it clear that LDIN lights are not approach lights for purposes of instrument approach procedures. It appears that the language of #607 above was lifted out of the AC and placed out of context into the AIM's Pilot/Controller Glossary definition of ALS. Further, it is worth noting that the Kennedy LDINs are much farther [apart] than the "general" spacing of 3,000-foot intervals. Why do pilots flying the 13L/R curved visual flight track not need this generally accepted spacing of 3,000 feet?

The body of the AIM seems to agree with the foregoing AC's definition of ALS:
AIM:

2-1-1. APPROACH LIGHT SYSTEMS (ALS)

a. Approach light systems provide the basic means to transition from instrument flight to visual flight for landing. Operational requirements dictate the sophistication and configuration of the approach light system for a particular runway.

b. Approach light systems are a configuration of signal lights starting at the landing threshold and extending into the approach area at a distance of 2400 to 3000 feet for precision instrument runways and 1400 to 1500 feet for nonprecision instrument runways. Some systems include sequenced flashing lights which appear to the pilot as a ball of light traveling towards the runway at high speed (twice a second). (See Figure 2-1-1)

AERONAUTICAL CHARTING FORUM
INSTRUMENT PROCEDURES SUBGROUP
OPEN AGENDA ITEMS FROM MEETING 97-1

OPI	AGENDA ITEM (ISSUE)	REQUIRED ACTION
AFS-440 ATO-120, AVN-160	**92-02-102** (SID Processing) (SFO/MRY/SBA SID Minimums)	Circulate draft Order. Fix SID/IFR Departure Minimums.
ATA-130, ATO-120	**92-02-103** (SID MOCAs)	Research IACC specifications.
AFS-450	**92-02-104** (Precip. Terrain)	Track funding issues & report.
AFS-450	**92-02-105** (Circling Areas)	Complete ASAT modeling/testing.
AFS-440	**92-02-110** (Cold Wx Altimeter)	Develop criteria.
AFS-420 AFS-440	**93-01-121** (AC 90-X) (AC 61-27) Track re-write status.	Complete project.
AFS-440	**94-02-133** (Descent Grad)	Criteria in TERPS Change 17.
AFS-440 AOPA	**95-01-140** (TAA for GPS) (TAA Controlled Airspace)	Track program/status reports. Provide position.
AFS-440	**95-01-141** (DME ARC IAFs)	Finalize criteria & provide report.
AFS-450 AFS-420, ALPA	**95-01-143** (IAP Max. Speed) (AIM Change)	Continue testing/provide report. Prepare/process AIM/AIP article.
ATO-110/120	**96-01-155** (OROCA Use)	Work issue/provide report.
AFS-420	**96-01-159** (Ceiling Req.)	Coord. with legal, NBAA and AOPA.
AFS-440	**96-01-162** (NoPT/PT Routes)	Work with AFS-600 to include in Instrument Flying Handbook.
AFS-420	**96-01-163** (ILS Fix)	Track CFR change/provide report.
AFS-450	**96-01-166** (“On Course”)	Work issue/provide report.
AFS-410 AFS-440	**96-02-170** (VNAV/RNAV Vis.) (TERPS Table 6 Change)	Track issue/cleanup existing IAPs. Evaluate for change.
AFS-440	**96-02-171** (FDC NOTAMs)	Provide briefing.
AFS-160	**97-01-174** (FPO/Pilot Coord.)	Work issue/provide report.
AFS-410	**97-01-175** (Create FSIB)	Create FSIB through AFS-200.
Jeppesen AFS-420	**97-01-177** (Check Data Base) (Process Jeppesen report)	Provide report to AFS-420. Forward report to AF for F&E.
AFS-440	**97-01-178** (LDIN Lights)	Research directives/report.
AFS-440	**97-01-181** (NP MAP Turns)	Study issue/provide report.
AFS-440, ATA-130	**97-01-182** (Alt MAP Fixes)	Study issue/provide report.
AFS-400	**97-01-183** (Part-Time Alt VDP)	Study issue/provide report.
AFS-440, AVN-160	**97-01-184** (MAP Verbiage)	Review 8260.19/provide report.