AERONAUTICAL CHARTING FORUM
Charting Group
Meeting 09-02 - October 28-29, 2009
RECOMMENDATION DOCUMENT
FAA Control # 09-02-220

Subject: Multiple Intermediate Segments in Recent RNP AR (SAAAR) IAPs.

Background/Discussion: IACC and FAA specifications require the charting of the intermediate and final approach fix and segments shown in the profile view of IAP charts. The course reversal, when published, must also be shown in the profile view. (See Attachment # 1) The profile view provides an additional procedural cross-check during the critical phase of flight on an IAP when other than terminal/en route obstacle clearance is provided. This is critical for obstacle clearance in non-precision IAPs (See **F70 RNAV 18 IAP**) and for ATC compliance in multiple intercept point ILS IAPs (See **KSEA ILS 16R IAP**). In 1974 the TWA 514 CFIT accident may have been avoided had the profile view been in compliance with these IACCs specifications, which were in effect on the date of that accident (See **KIAD 1974 VOR/DME 12 IAP**).

Until recently RNP AR IAP procedures (thus charts) have had one intermediate segment, thus IACC compliant profile views (See **KRIL RNP AR Z 26 IAP**). The RNP AR order, 8260.52 implies a single intermediate segment. With the recent publication of initiated RNP AR IAPs at KBOI and KRDU, the ad hoc concept of multiple intermediate segments has now appeared "*to facilitate flow control and industry use*." (See Attachment #2, Flight Procedures Standards Waiver. Also, see **KBOI RNP AR RNP Z 28R IAP** and note foreshortened profile view)

It should be noted here that the issue of the chart clutter in the new KBOI and KRDU RNP AR procedures is not an issue being brought forth by this Recommendation Document. That is being handled by the PARC's Charting Action Team and DOT's Volpe. This Recommendation Document is limited to the issue of foreshortened profile views. It should also be noted that this issue of foreshortened profile views is concurrently being brought before the PARC. The FAA's RNAV/RNP Office recently recommended that NBAA also bring the profile view issue to the ACF's Charting Group.

Attachment #2 illustrates what is essentially a boiler-plate waiver for each of the RNP AR IAPs at KBOI and KRDU. In NBAA's view these waivers do not document an equivalent level of safety. Further, NBAA believes this is an incorrect use of the Flight Procedures Standards waiver process; that process is intended for waivers of TERPs criteria under TERPs, Paragraph 141. The waivers at issue are waivers of charting standards. Charting standards should not be subject to blanket waivers, rather when justified, the charting standards should be changed.

There are presently three low-traffic airports (KBZN, KOTH, and KLWS) where RNP AR procedures are being developed with multiple intermediate segments. Thus, it is appears the NFPO is developing procedures criteria and charting specifications on an ad hoc basis, following the KBOI and KRDU "model." Presumably, this will result in the routine issuance of waivers to the IACC and FAA profile-view charting specifications. Who will fly what simulator to

verify that these procedures are *"validated in the simulator with satisfactory results?"* (Attached waiver's equivalent level of safety #4.)

Troubling as well are deviations from these charting specifications without a waiver being documented (See KLWS RNAV (RNP) 12 & 8260-3 excerpt). This procedure is being presented for coordination without any reference to the deviation from the IACC specification and the FAA Order. Will future RNAV (RNP) AR procedures with multiple IF's and deviating from the requirement to chart the intermediate segment in the profile view also fail to document the applicable waiver, in effect establishing a "normalization of deviance"?

The importance of complying with these charting requirements is noted in NTSB's recommendation to the FAA concerning adherence to the IACC specification resulting from the accident investigation of TWA 514 (see attached). FAA's administrator accepted this recommendation (see attached letter).

Recommendations: The development of multiple IF RNP AR IAPs should be suspended, pending an objective safety review by this forum in coordination with the PARC. NBAA does not object to consideration being given in the interim to change air-carrier-initiated multiple IF RNP AR IAPs to special instrument approach procedures. Any other RNP AR IAPs currently in development should contain only one IF so that present charting specifications will be respected.

After due consideration, if an objective consensus is reached that final-segment-only profile views are acceptable (or preferred) in RNP AR IAPs, NBAA will fully support both IACC and FAA charting specifications being changed to reflect this ***for RNP AR IAPs only.***

Comments: This recommendation affects IACC and FAAO 8260.19D profile charting requirements. It also affects the NFPO's apparent internal policy change to design all pending and future RNP RA IAPs with multiple intermediate segments.

Submitted by: Richard J. Boll II
Organization: NBAA
Phone: 316-655-8856
FAX:
E-mail: richard.boll@sbcglobal.net
Date: October 2, 2009

ATTACHMENT # 1 – ICAA AND FAA PROFILE VIEW SPECIFICATIONS

IACC Specification:

3.4.5.1.1:

A profile diagram of the instrument approach procedure shall be placed in the space provided below the planview. Those facilities, intersections, fixes, etc. identified in the procedure to be used in executing a course reversal and/or involved in the Intermediate/final approach segment with minimum altitudes, as required by the procedure, shall be shown. Size and style of type shall be as indicated in the appendix.

FAA Specifications (FAAO 8260.19D):

805 i (4):

Develop intermediate segments for all IAPs except "hold-in-lieu-of-PT" and "PT No-FAF" procedures. Where intermediate segments have been established, the intermediate fix (IF) will be defined on the procedure in the planview.

852 b (3):

On procedures that do not authorize a PT or holding pattern at the FAF, enter the fix/facility from which the profile is to start. The profile must include the intermediate fix. If required for clarity, the profile may be extended to include all fixes established on the final or intermediate course.

ATTACHMENT # 2 – BOISE RNP AR 28R TERPS WAIVER

US Department of Transportation **Federal Aviation Administration**	**FLIGHT PROCEDURES STANDARDS WAIVER**	**FLIGHT STANDARDS USE ONLY** **CONTROL NO:**

1. Flight Procedure Identification:
Boise, ID (BOI)
Boise Air Terminal/Gowen Fld
RNAV (RNP) Z RWY 28R

2. Waiver Required and Applicable Standard:
The profile must include the intermediate fix (IF). FAAO 8260.19D, Paragraph 805 i (4) 852, b (3)

3. Reason for Waiver *(Justification for nonstandard treatment)*:
Five (5) separate intermediate segments with designated IF fixes are used on this procedure to facilitate flow control and industry use, therefore, an intermediate fix will not be charted in the profile.

4. Equivalent Level of Safety Provided:
1. Procedure is Special Aircraft and Aircrew Authorization Required (SAAAR).
2. Intermediate segments/fixes (IFs) will be charted on the Planview.
3. Procedure coded for multiple Intermediate Fixes (IFs) per user request.
4. Validated in simulator with satisfactory results.

5. How Relocation or Additional Facilities Will Affect Waiver Requirement:
NA - RNAV Procedure

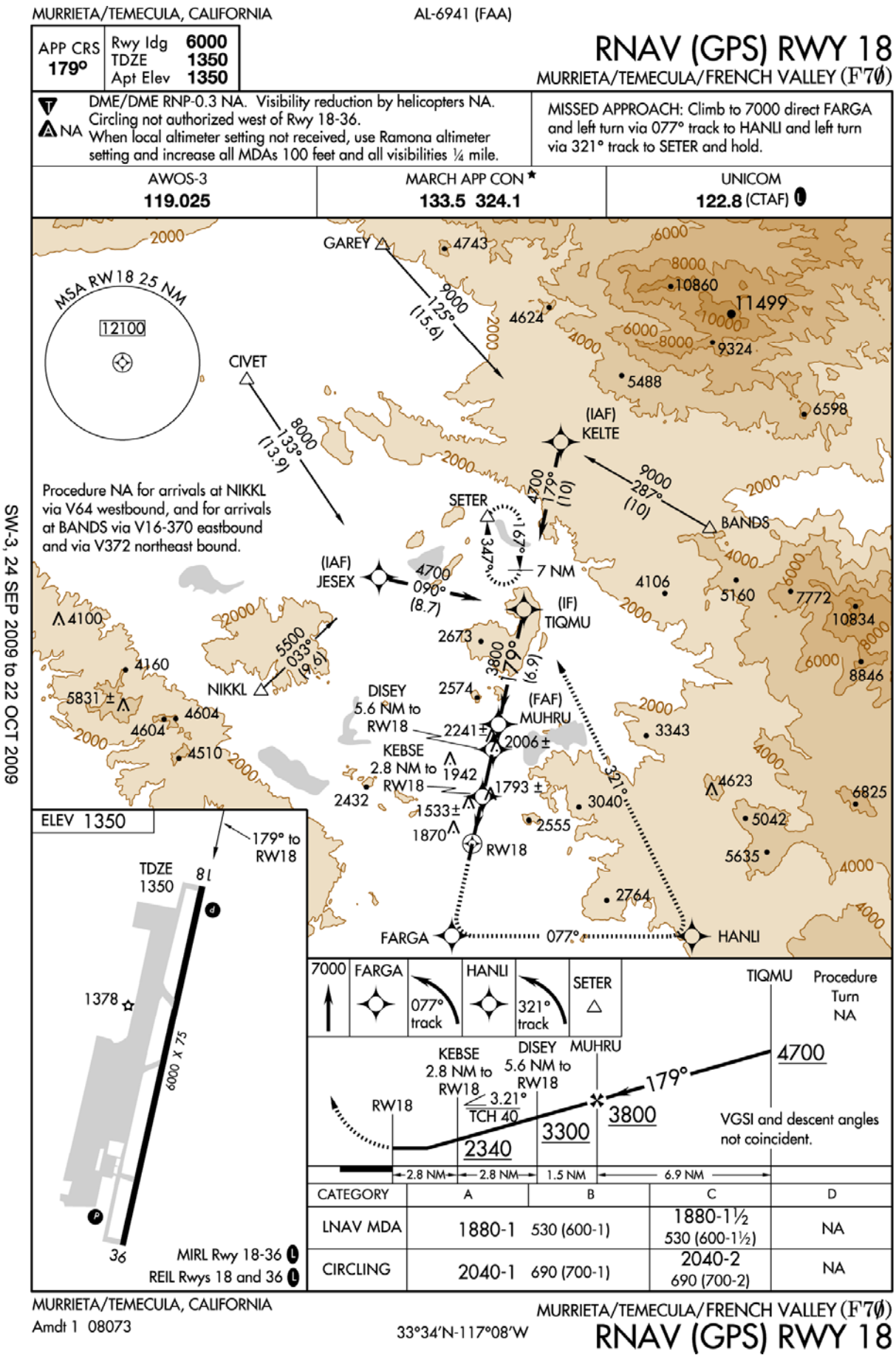
6. Coordination With User Organizations *(Specify)*:
AJW-324: _____

7. SUBMITTED BY

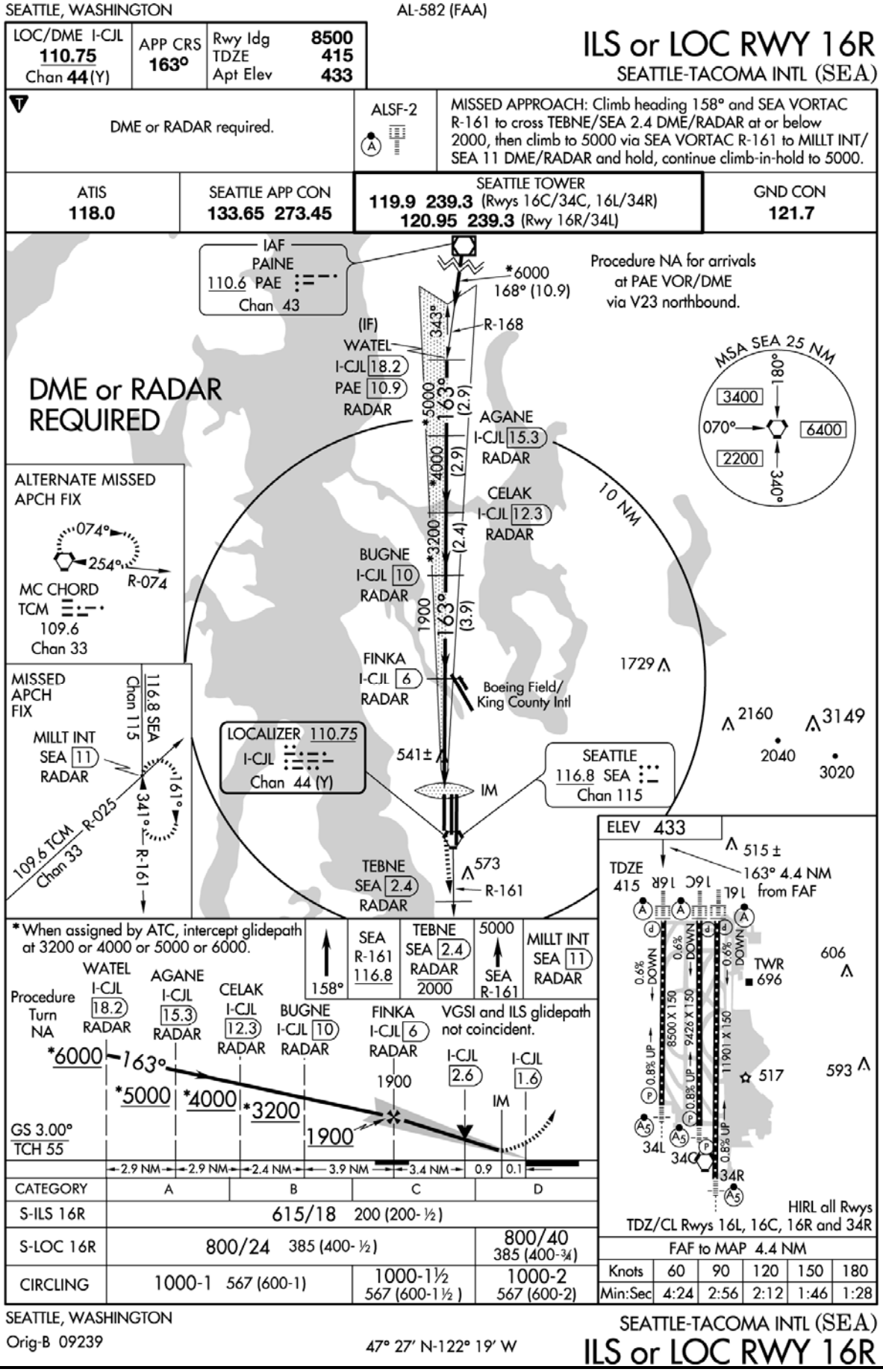
DATE:	Office Identification:	Title:	Signature:
	AJW-32	**Manager, National Flight Procedures Office**	**Danny E. Hamilton**

FAA FORM 8260 - 1 / July 2003 (computer generated)

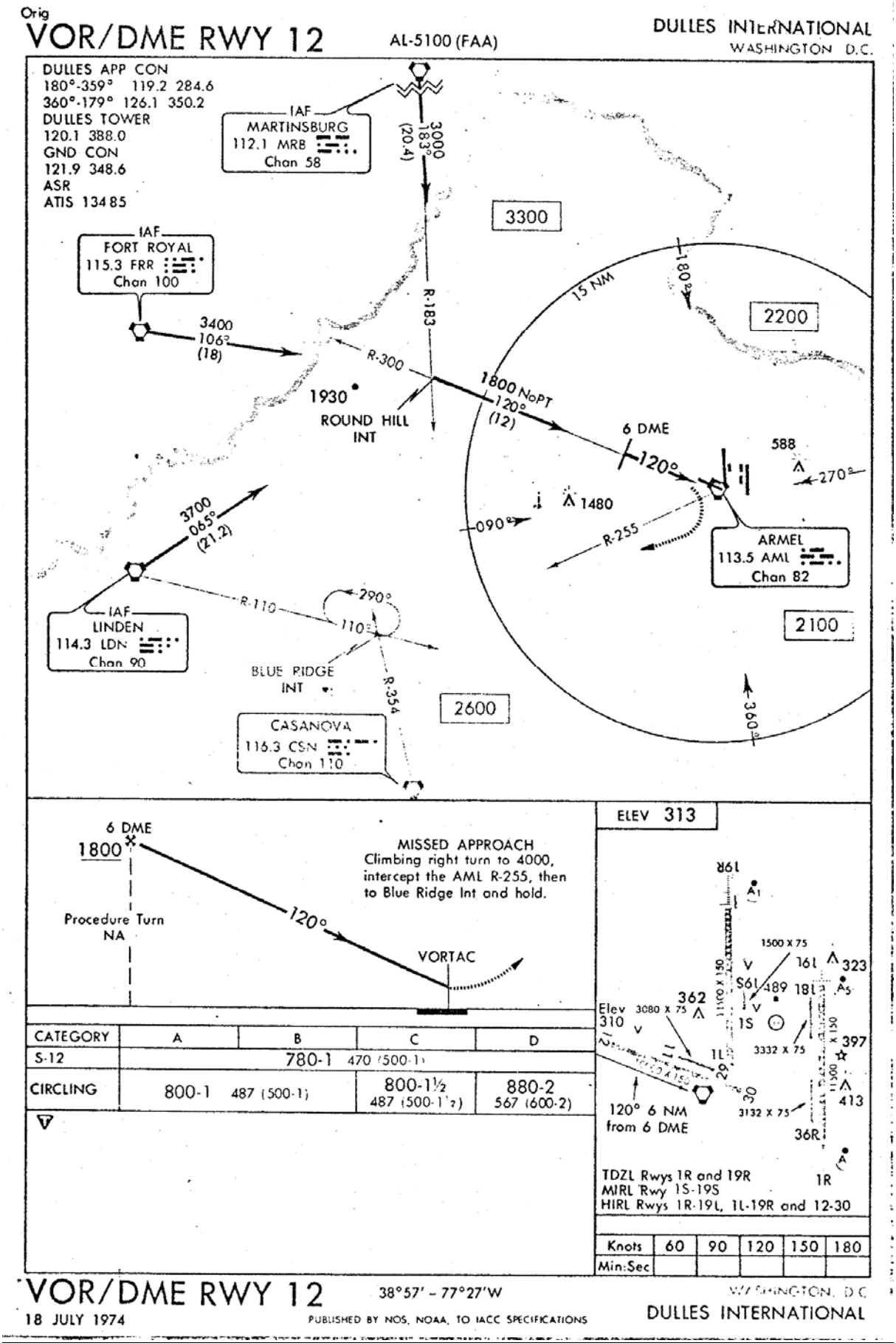
F70 RNAV 18 IAP



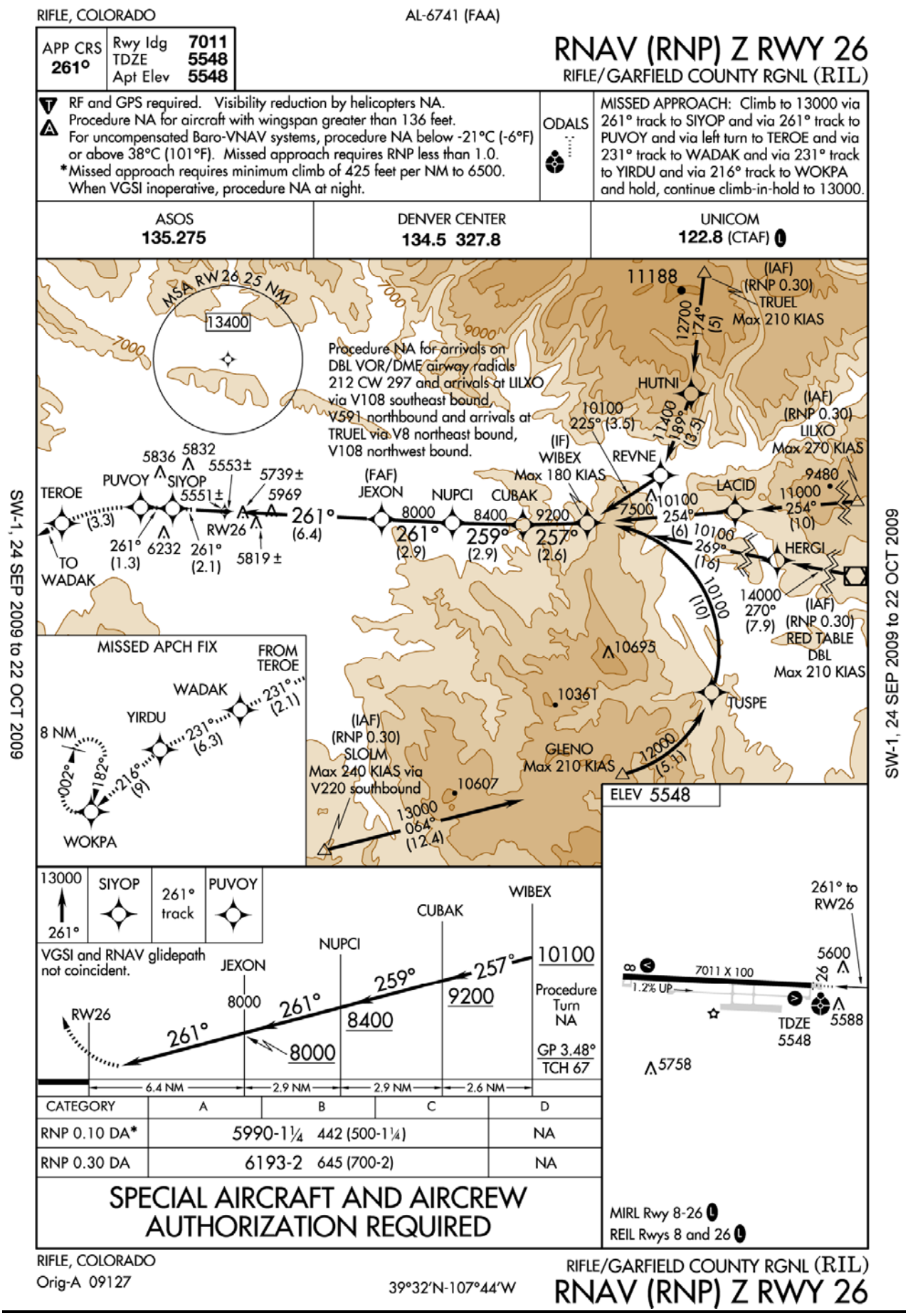
KSEA ILS 16R IAP



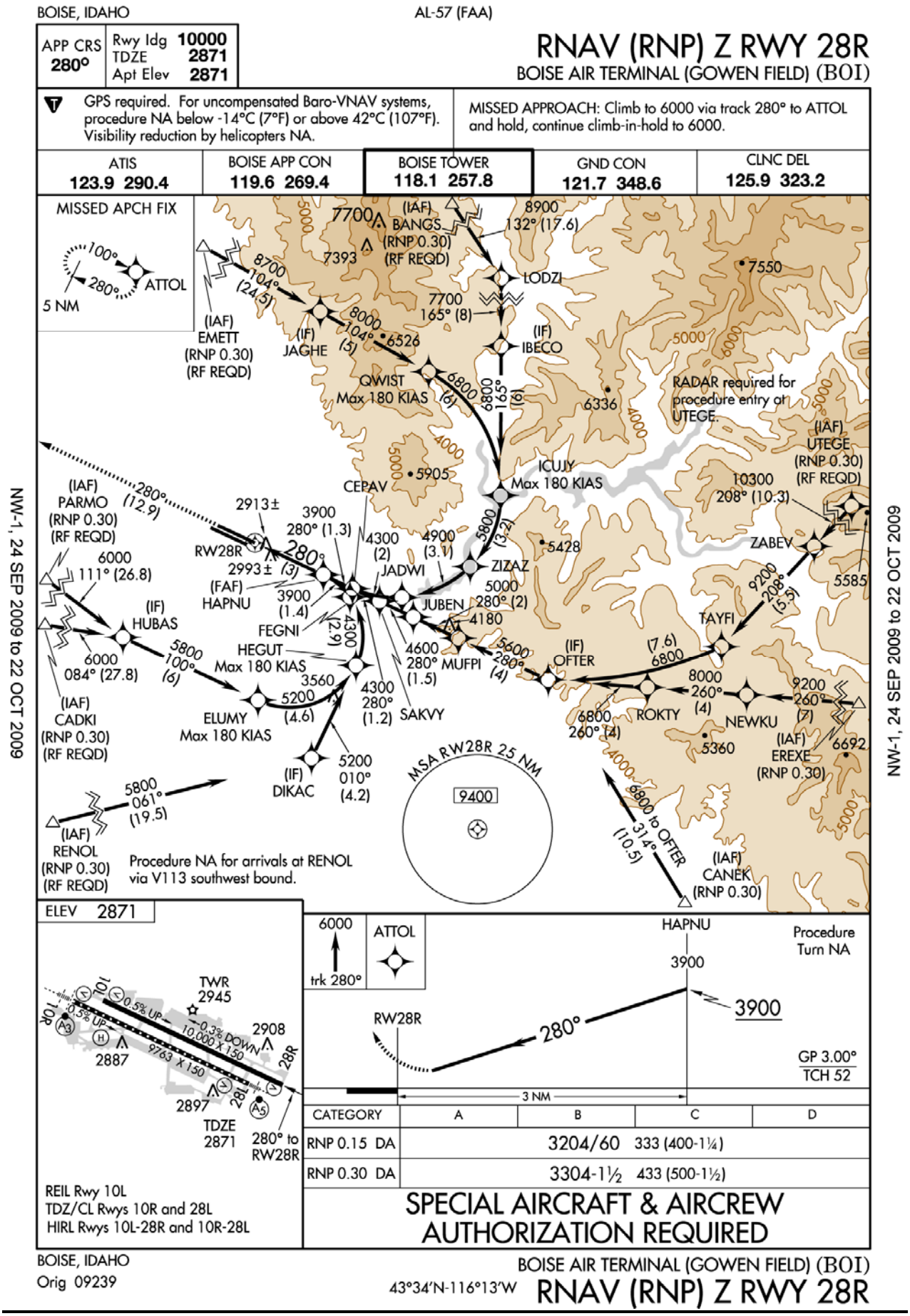
KIAD 1974 VOR/DME 12 IAP



KRIL RNP AR Z 26 IAP



KBOI RNP AR RNP Z 28R IAP



LEWISTON, IDAHO

APP CRS	Rwy Idg	5002
113.52°	TDZE	1415
	Apt Elev	1442

RNAV (RNP) Z RWY 12

LEWISTON-NEZ PERCE COUNTY (LWS)

GPS and RF required. Visibility reduction by helicopters NA. For uncompensated BARO-VNAV systems, procedure NA below -16C (3F) or above 36C (98F). *Missed approach requires minimum climb of 260 feet per NM to 3400. Procedure NA at night.
NA when local weather not available.

MISSED APPROACH: Climb to 6000 via track 116.62 to VOSKY and via left turn to EVHOG and via track 049.82 to OFINO and hold.

ASOS	SEATTLE CENTER	LEWISTON TOWER *	GND CON	UNICOM
135.575	123.95 282.3	119.4 (CTAF) 318.8	121.9	122.95

PROTOTYPE: NOT FOR NAVIGATION

BIDDY	4634.286N/11724.824W					
FOJJO	4630.336N/11717.430W					
HOBOP	4628.596N/11713.315W					
PUW	4640.458N/11713.410W					
HILUR	4632.381N/11713.843W					
JENAS	4629.813N/11712.847W					
OFINO	4631.323N/11609.915W					
WANEY	4637.649N/11706.363W					
TIZHO	4635.705N/11712.994W					
NILDE	4627.203N/11710.026W					
ONLAW	4625.288N/11705.517W					
IYTAM	4624.567N/11704.113W	VOSKY	4619.951N/11656.611W			
RW12	4622.907N/11701.412W	EVHOG	4619.084N/11647.956W			

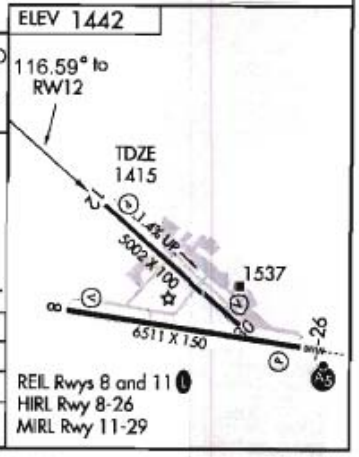
RF CENTER FIXES:

CODUT	4624.060N/11651.335W
SAWJE	4619.330N/11710.817W
HEPEL	4633.413N/11708.243W
RENLE	4633.007N/11707.417W
CUGEM	4632.414N/11707.549W
KEDGY	4630.951N/11706.895W

VGSI and RNAV glidepath not coincident.

CATEGORY	A	B	C	D
RNP 0.30 DA*	1683 - 1	268 (300-1)		
RNP 0.30 DA	1887 - 1¾	472 (500-1¾)		

SPECIAL AIRCRAFT AND AIRCREW AUTHORIZATION REQUIRED



LEWISTON, IDAHO
Orig

46°22'N- 117°01'W

LEWISTON-NEZ PERCE COUNTY (LWS)

RNAV (RNP) Z RWY 12

NOTES / EXPLANATIONS FROM OPPOSITE SIDE OF FORM:
SEE ATTACHED AIRSPACE LETTER

$ RNP 0.50 REQUIRED TO MITIGATE TERRAIN/CONTROLLED AIRSPACE REQUIREMENT AND TO ACCOMODATE MINIMUM SEGMENT LENGTH REQUIREMENTS..

ACT: -16.4C
APT ISA: +12.12C
DELTA ISA LOW: -28.52
CRITICAL LOW TEMP: -16C
DELTA ISA HIGH: +24.87C
CRITICAL HIGH TEMP: +36C

MISSED APPROACH FAAO8260.52, PARA 4.2 (STANDARD RNP MA)

RF TURN RADIUS/BANK ANGLE COMPUTATIONS:

SEGMENT	ALT	KIAS	KTAS	HAA	VKTW	TR	BA
FOWBO-WANEY	10266	210.00	253.12	8823.8	108.42	5.30	19.77
WANEY-TIZHO	8652	210.00	246.34	7209.9	92.10	4.70	19.57
TIZHO-HILUR	6985	210.00	239.33	5542.6	75.43	4.00	19.88
JENAS-NILDE	4499	210.00	230.99	3556.7	55.57	4.40	15.23
ONLAW-IYTAM	2650	165.00	173.75	1209.2	50.00	7.00	5.58
VOSKY-EVHOG	6000	265.00	296.80	4558.2	65.58	5.50	19.20

3.1 DEGREE GLIDESLOPE AND 56.0' TCH UTILIZED TO ELIMINATE GQS PENETRATIONS.

PARA 251 RWY 12 20:1 PENETRATIONS:
KLWSL011 TREE 462258.69N/1170132.73W 1390.00 MSL
KLWSL014 TREE 462300.88N/1170133.91W 1393.00 MSL

PARA 251 RWY 12 34:1 PENETRATIONS:
KLWSL011 TREE 462258.69N/1170132.73W 1390.00 MSL
KLWSL014 TREE 462300.88N/1170133.91W 1393.00 MSL

VISI APPROVAL LETTER
VISUAL SEGMENT PENETRATIONS:
KLWSL011, 1390' MSL TREE 705' FROM APPROACH END OF RUNWAY 12, 51' RIGHT OF CENTERLINE, PENETRATES OIS BY 4.96'. KLWSL014, 1393' MSL TREE 914' FROM APPROACH END OF RUNWAY 12, 60' RIGHT OF CENTERLINE, PENETRATES OIS BY 0.29'. BOTH OBSTACLES HAVE A 1B ACCURACY CODE ASSIGNMENT. TREES WILL BE CHARTED ON THE PROCEDURE.

XP OBSTACLE CLIMB GRADIENT OF 260 FT PER NM TO 3400 REQUIRED.

PART B - SUPPLEMENTAL DATA

1. COMMUNICATIONS WITH:	2. WEATHER SERVICE	3. ALTIMETER SETTING
ZSE ARTCC **SEA APP CON** **LWS ATCT** SATISFACTORY ON: [X] VHF [X] UHF [ ] HF	[ ] NWS [ ] FAA [ ] A/C OTHER: **ASOS** LOCATION: **KLSW** HRS OPTN: **24**	SOURCE: **KLWS** DISTANCE: **0** HOURS REMOTE OPERATION: ADJUSTMENT:

4. MONITOR STATUS	PRIMARY	SECONDARY
	NAVAID:	NAVAID:
	MONITOR POINT:	MONITOR POINT:
	HRS OPTN: CAT 1 / CAT 3	HRS OPTN: CAT 1 / CAT 3

5. AIRSPACE			
	FLOOR OF CONTROLLED AIRSPACE UNDER FAC		CONTROL AREA
	CONTROL ZONE:	HOURS OPTN	TRANSITION AREA

6. APPROACH & RUNWAY LIGHTING				
	ALS	X	REIL **8, 12**	
	(S) SALS		TDZ	
X	MALS-R **26**		C/LINE	
X	HIRL **8, 26**	X	OTHER (Specify) **PAPI-4L 12, 26, VASI-4L 8, 30**	
X	MIRL **12, 30**			

7. RUNWAY MARKINGS **BSG - 12, 30**	8. RUNWAY VISUAL RANGE	
ALL WEATHER **PIR-G 26**	APPROACH	
INSTRUMENT **NPI-G 8**	ROLL OUT	
9. GLIDE SLOPE: G S ANGLE: **3.1**	ELEV RWY THRESHOLD: **1369.9**	
DISTANCE FROM RWY:	ELEV GS ANTENNA:	
	THRESHOLD CROSSING HEIGHT: **56.0**	

10. FINAL APPROACH COURSE AIMING			
	X	RUNWAY THRESHOLD	F T. FROM THRESHOLD
	X	ON CENTERLINE	F T. FROM CENTERLINE

11. WAIVERS OF STANDARDS	NUMBER OF WAIVERS ON FILE	DATES OF APPROVAL
	NONE	

PART C - REMARKS:
ASOS IS ON SERVICE-A.
PRECIPITOUS TERRAIN EVALUATION COMPLETE.

What about not charting the intermediate segment in the profile view?

QUALITY CHECKED

PART D - PREPARED BY:	DATE:
KEITH D. SHYKES	**07/14/2009**
TITLE: **AERONAUTICAL INFORMATION SPECIALIST**	OFFICE: **AJW-324**

APPENDIX I

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: September 4, 1975

Forwarded to:
Honorable James E. Dow
Acting Administrator
Federal Aviation Administration
Washington, D. C. 20591

SAFETY RECOMMENDATION(S)

A-75-74 thru -77

On December 1, 1974, Trans World Airlines Flight 514, a B-727-231, crashed at Berryville, Virginia. During the National Transportation Safety Board's public hearing into the accident, testimony was heard regarding cartographic specifications and procedures used by the Jeppesen Company and the National Ocean Survey (NOS) to prepare instrument approach charts.

The Safety Board determined that the Jeppesen approach chart used by the crew of TWA 514 and the NOS approach chart used by the FAA controllers handling the flight were properly constructed; both met the requirements outlined in FAA Form 8260.5.

However, differences do exist between the Jeppesen charts and the NOS charts. The two charts vary considerably in areas where FAA Form 8260.5 does not specify exact format. The specific areas in which the Jeppesen charts and the NOS charts differ are (1) depiction of the minimum sector altitudes, (2) size and structure of the profile view, (3) criteria for the depiction of obstacles on the plan view, (4) color of inks, (5) size of type, and (6) portrayal of navigational facilities.

The Jeppesen Company produces most of the instrument approach charts used by the civil aviation community. The company receives a wide range of comments and suggested changes in these charts from pilots, carriers, and other segments of the industry, and is constantly revising its published charts to respond to the needs and requirements of its users.

The official United States Government specifications for cartographic presentation are contained in the Interagency Air Cartographic Committee (IACC) Manual No. 4, Flight Information Publication, Low-Altitude, Instrument Approach Procedures. The National Ocean Survey is governed by the cartographic specifications of the IACC Manual. This interagency committee is made up of representatives of the Federal Aviation Administration, the Department of Commerce, and the Department of Defense.

APPENDIX I

Honorable James E. Dow

The Safety Board believes that the latitude allowed in preparation of the two published charts creates an undesirable degree of dissimilarity. While these variations do not necessarily create a hazard, the application of uniform criteria and uniform cartographic depictions would eliminate any areas of possible misinterpretation. In order to insure that the best cartographic techniques are identified and employed, we believe that both types of charts should be analyzed to determine the most effective specifications for instrument approach charts. Once identified, these specifications should provide a basis for revision of IACC Manual No. 4.

In order to insure consistency between the preparation of FAA Form 8260.5 and the revised IACC specifications, the Safety Board further believes that reference to these revised specifications should be required of FAA personnel engaged in the preparation of FAA Form 8260.5.

Accordingly, the National Transportation Safety Board recommends that the Federal Aviation Administration:

1. In concert with the two other IACC Members (Department of Commerce and Department of Defense) and the Jeppesen Company, conduct a study of the cartographic techniques and specifications used throughout the aviation industry for approach charts for the purpose of identifying those techniques and specifications that best lend themselves to uniformity and standardization.

2. Based on the above study, initiate steps to revise the IACC manual to include those techniques and specifications that best lend themselves to uniformity and standardization and to which there is unamimous agreement by the parties engaged in the study.

3. Require that the IACC manual be used as the minimum standards for cartographic presentation of specified data on all instrument approach charts used in U. S. civil and military aviation.

4. Require that the revised IACC manual be used as a mandatory reference by FAA personnel whenever a new instrument approach procedure is developed or whenever an existing procedure is modified.

APPENDIX I

Honorable James E. Dow

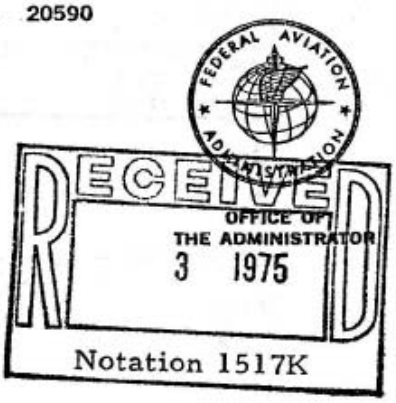
McADAMS, THAYER, BURGESS, and HALEY, Members, concurred in the above recommendation. REED, Chairman, did not participate.

By: John H. Reed
Chairman

APPENDIX I

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

WASHINGTON, D.C. 20590



September 23, 1975

Honorable John H. Reed
Chairman, National Transportation Safety Board
800 Independence Avenue, S. W.
Washington, D. C. 20594

Dear Mr. Chairman:

This is in response to NTSB Safety Recommendation A-75-78.

Recommendation. Revise paragraph 1011 of FAA Handbook 8260.19, dated December 12, 1974, to require that on approach procedures, for which neither a procedure turn nor a 1-minute holding pattern is authorized, the profile must start either at the intermediate fix or at an altitude equal to the minimum sector altitude for the quadrant in which the procedure begins.

Comment. Change 14 to Handbook 8260.19 is in preparation. This will include the following instruction:

> "On procedures when neither a procedure turn nor a one-minute holding pattern is authorized, the profile view shall include the intermediate fix and should be extended to include all fixes that are established on the final approach course extended."

This will ensure a smooth transition from the airway structure to the profile of the instrument approach procedure.

Minimum Sector Altitudes (MSA) are provided for emergency use. The MSA's were never intended for operational use since sectorization is not generally accomplished to obtain lower altitudes or to be compatible with operational altitudes published for specific terminal routes. Additionally, the range of MSA data is 25 nautical miles (plus a four-mile buffer) which may not correspond with all terminal routes portrayed on an instrument approach chart.

Sincerely,

James E. Dow

James E. Dow
Acting Administrator

MEETING 09-02: Mr. Richard Boll, NBAA, presented the issue and suggested that until the larger issue of RNAV RNP approach chart complexity is resolved through the FAA PARC Charting WG review, the "waivered" public use RNAV AR procedures, i.e. Boise and Lewiston, should be withdrawn from public use. Instead, these public use procedures should be restricted for use only by approved operators who accept the waiver to not chart the 5 intermediate fix route segments in the profile view.
Mr. Tom Schneider, FAA/AFS420, suggested another option could be to chart only the IF route that is aligned to the FAC. This idea was not received well, and some commented that it could be misleading and might cause additional misunderstanding. In the case of Boise, only 1 of 5 routes would then be shown in the profile. Mr. Schneider then suggested that maybe a reference note could be added to the profile view to tell pilots to refer to the chart planview for IF route segment information.
It was discussed that the FAA PARC Charting WG, led by Mr. Pedro Rivas, ALPA, has been tasked with reviewing RNAV RNP Chart Saturation regarding these types of situations and will provide recommendations. Mr. John Moore, FAA AeroNav Services, and Mr. Schneider commented that the ACF does not have the authority to suspend any program, including RNAV AR procedure development.
It was mentioned that the PARC Charting WG plans to complete its review of RNAV RNP Chart Saturation and provide recommendations to the PARC by April 2010. An alternative would be to carry the issue until the next ACF pending ACF consideration of the PARC's recommendations.
Still at issue is how many public use RNAV RNP AR procedures with multiple IF segments are "in the pipeline" and might be released in the interim. Mr. Schneider said there are several such procedures in work.
ACTION: Mr. Richard Boll will coordinate with Mr. Brad Rush, FAA/AeroNav Services, as to a point of contact within AeroNav Services management to express NBAA's concern.
ACTION: Mr. Pedro Rivas to report on recommendations from the PARC.

MEETING 10-01: Mr. Brad Rush, FAA/AeroNav, and Mr. Richard Boll reported no new information was available but the PARC was expected to comment on the recommendations noted in the RNAV (RNP) Charting Options.
Mr. Tom Schneider, FAA/AFS-420, noted that the charting of multiple IF's on RNP SAAAR procedures will be a waivered practice.

ACTION: Mr. Pedro Rivas, ALPA, to report on recommendations from the PARC.

MEETING 10-02: See RNAV (RNP) Chart Options in paragraph V. D).

STATUS: CLOSED