

IFPP/10 RESULTS & PLANS FOR IFPP/11

Washington, DC

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MEMBER**



**Federal Aviation
Administration**



IFPP/10 OVERVIEW

- **16 DIFFERENT STATES PARTICIPATED**
- **10 DIFFERENT ORGANIZATIONS PARTICIPATED**
- **WORKING GROUP MEETINGS FIRST WEEK**
- **PLENARY MEETING SECOND WEEK**
- **29 PAPERS PRESENTED TO PLENARY**
 - **7 Working Group Reports**
 - **2 New Manuals**
 - **13 Papers With Amendments Accepted**



IFPP/10 OVERVIEW

- AIR TRAFFIC MANAGEMENT WG (ATM)
- INTEGRATION WG (IWG)



ATM

- **ACCOMPLISHMENTS**

- Continuous Climb Operations Manual Completed
- Continuous Descent Operations Manual Completed

- **PLANS**

- Review and Make Changes to Doc 4444
- Address RNAV Transitions
- Address Phraseology and Termination Restrictions



IWG ACCOMPLISHMENTS

- **CHARTING EXAMPLES**
 - **11 Different Examples for Inclusion in Doc 8697 Attachment**
- **NAMING CONCEPTS FOR PBN INSTRUMENT PROCEDURES**
 - **1 ½ Days of Discussion**
 - **Ad Hoc Group Formed**
- **ANNEX 4 AMENDMENTS FOR PinS MANEUVERING VISUAL SEGMENT CHARTING (2 Papers)**
- **DOC 8697 AMENDMENTS FOR PinS MANEUVERING VISUAL SEGMENTS (2 Papers)**
- **PinS LPV CHARTING CONCEPTS PAPER**

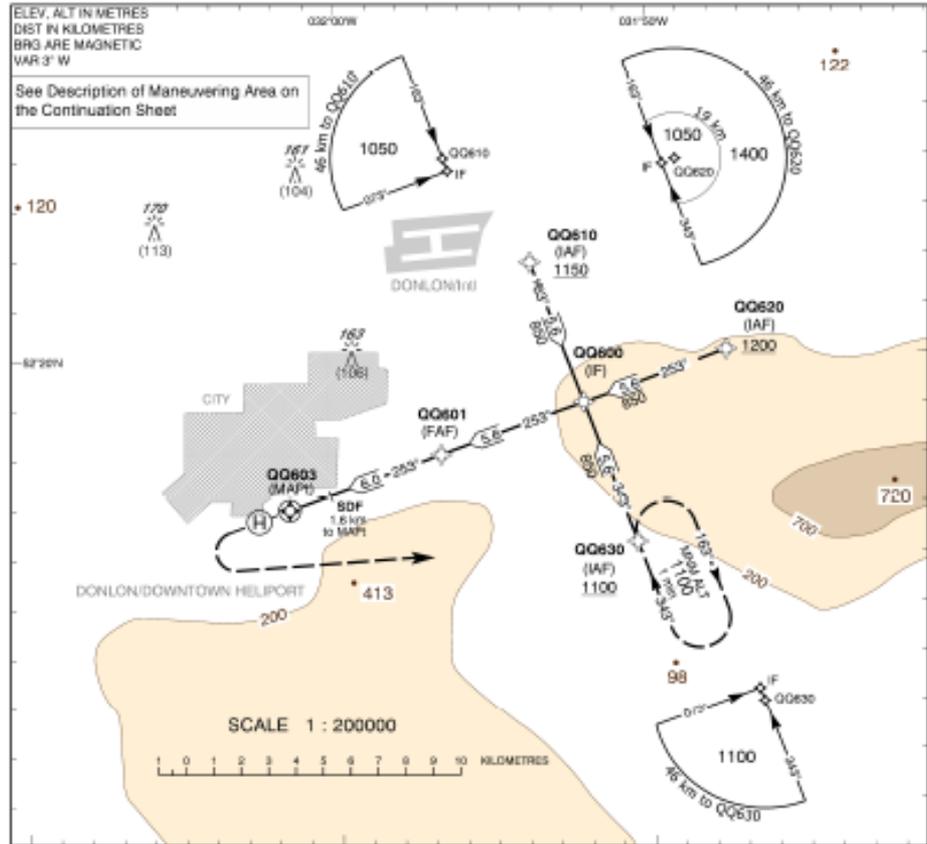


INSTRUMENT APPROACH
CHART - ICAO

HELIPORT ELEV 57m
HEIGHTS RELATED TO HRP

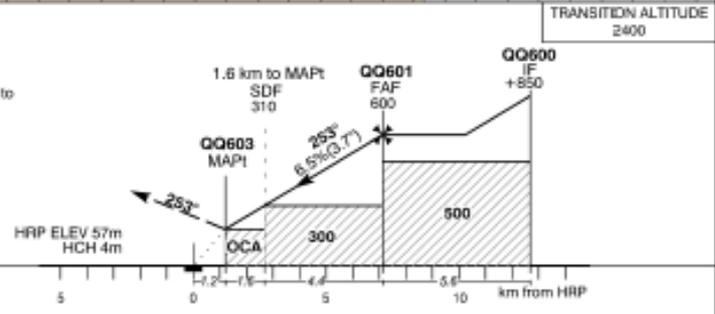
DONLON APP 118.1
DONLON TWR 118.1

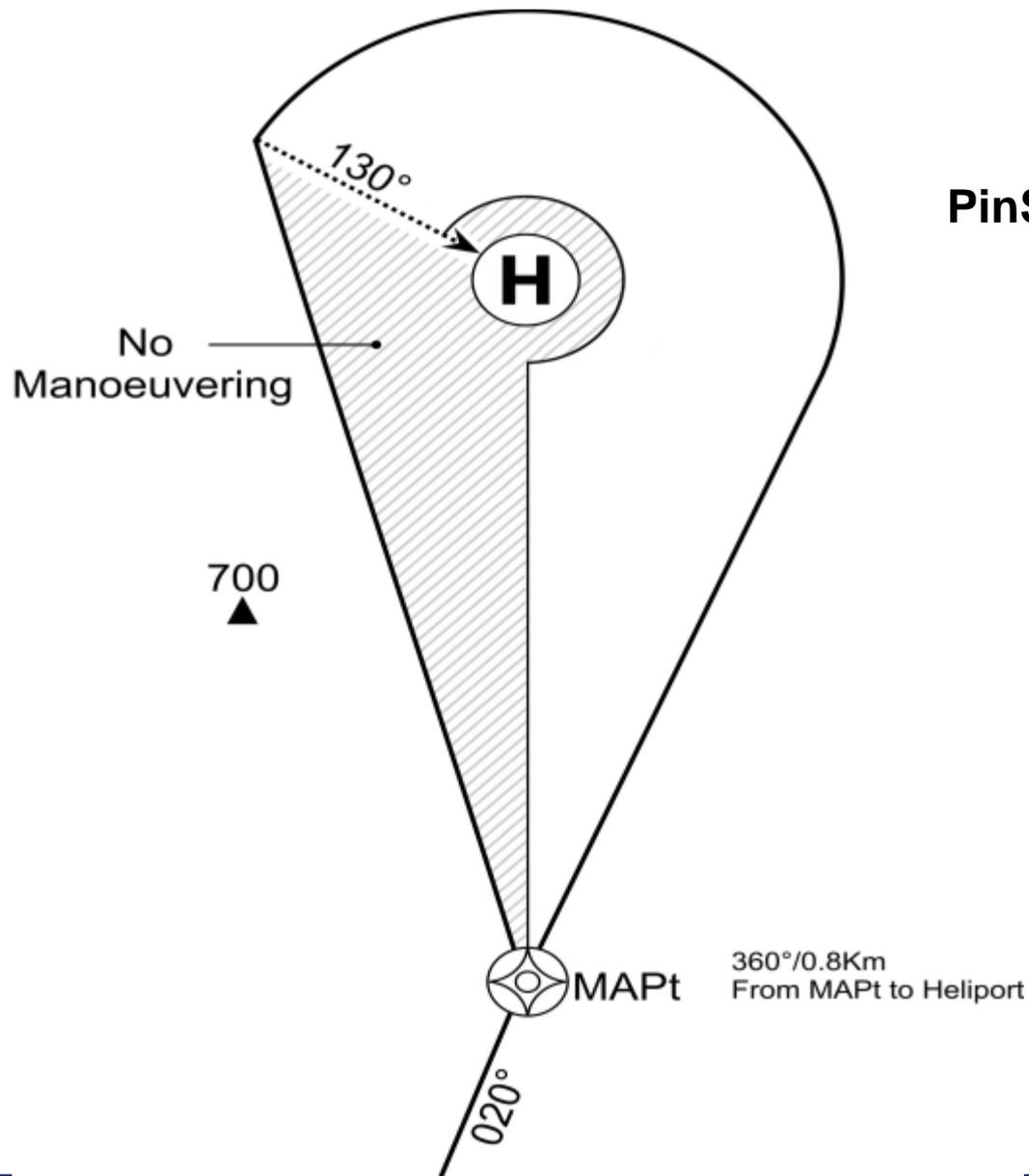
DONLON/ DOWNTOWN HELIPORT (EAQQ)
RNAV (GNSS) 253



MISSED APPROACH
Climb on course 253°. At 430m turn left and continue climb to 1100m to hold at QG630.

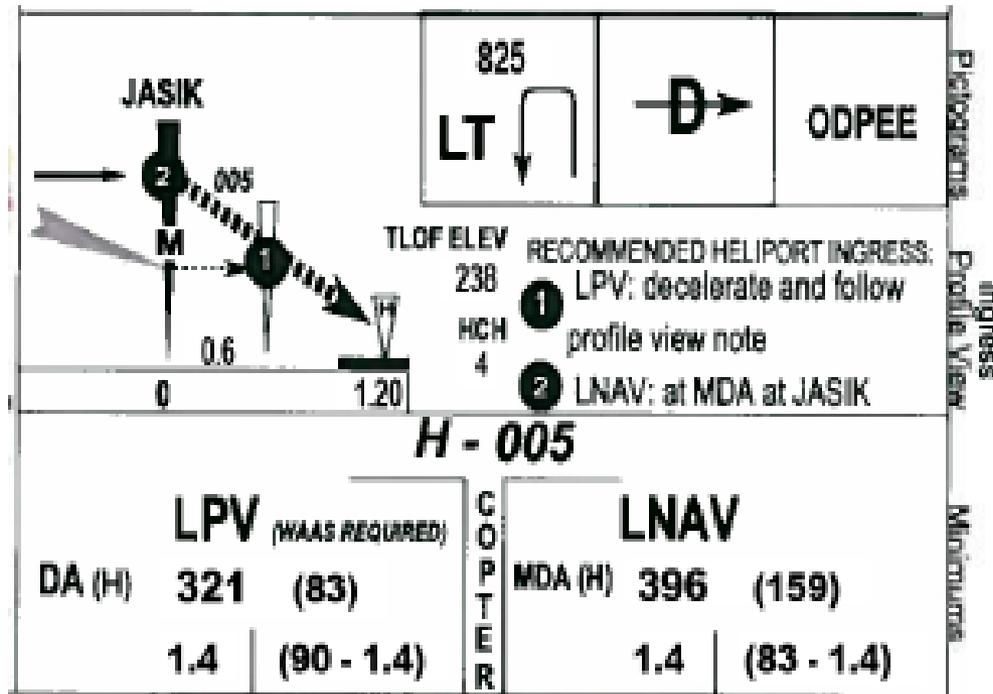
PROCEED VISUALLY
253°/ 1.2 km
VSDA 8.3°





PinS Approach Manoeuvring Visual Segment Inset

COPTER PinS LPV PROFILE INSET



PBN INSET

• **Authorization, example** = AUTHORIZATION REQUIRED

• **Navigation Specification, example** = RNP APCH, RNP AR

• **Mode of Operation, example** = LPV, LNAV/VNAV, LNAV, RNP 0.15

Commentary: Additional location of the same information found in the lines of minimums.

• **Procedure Qualifier, example** = COPTER, VISUAL, CIRCLING

Navigation Specification Requirement Limitations, example = GNSS Required,

• **Flight Plan Code, example** = B1, T2

Commentary - codes are found in “Doc 4444 2012”, see Appendix A to this paper.

• **Functional Requirements, example** =

-RF Leg Required,

-Missed Approach less than RNP 1,

-RNP Less than 0.3 anywhere,

-hybrid resolution such as RNAV ILS

TRANSITION PLAN

INSTRUMENT APPROACH CHART - ICAO	SBAS Ch 40123 W27A	AERODROME ELEV 30 m HEIGHTS RELATED TO THR RWY 27L - ELEV 20 m	<table border="1"><tr><td>APP</td><td>119.1</td></tr><tr><td>TWR</td><td>118.1</td></tr></table>	APP	119.1	TWR	118.1	DONLON/Intl (EA RNAV_(GNSS) Z RWY
APP	119.1							
TWR	118.1							

RNP APCH
LPV, LNAV/VNAV, LNAV,
STRAIGHT-IN
GNSS REQUIRED
FltPlnCode: S1
No Additional Functional Requirements

IWG ACCOMPLISHMENTS

Amend Vol. II, Part III, Section 2 Chapter 6 Appendix A as follows:

Add after 3 d) *Runway.....*

Examples: RW26R,....,RW02

The runway number field valid range is 01 to 36.

For SBAS circling only procedures the runway number field is encoded as the procedure final approach course rounded to the closest 10° and truncated to two characters.

For final approach sources from 355 degrees to 004 degrees, the truncated closest 10 degree expression is “36”.

IWG IFPP/11 PLANS

- **DEPICTION & PROMULGATION OF RNP ACCURACY REQUIREMENTS**
- **MATURE AMENDMENTS FOR CHARTING OF PinS LPV PROCEDURES**
- **AD HOC GROUP RESULTS ON NAMING OF PBN PROCEDURES**
- **PROMULGATION OF SBAS LPV LINES OF MINIMA**
- **NEW TASK: BEST INDUSTRY PRACTICES ON ENCODING THE SBAS FAS DATA BLOCK**



PROMULGATION OF SBAS LINES OF MINIMA

- SBAS PRECISION CRITERIA AMENDMENT ACCEPTED AT IFPP/10

- ACTF REPORT TERMINOLOGY

Annex 10 Terminology

New Annex 6 Terminology

NPA LP

TYPE A

APV*

TYPE A

SBAS PA CAT I

DH \geq 250'

TYPE A

SBAS PA CAT I

200' \leq DH < 250' TYPE B

* Just One Service Level ~ Not APV-I and APV-II



PROMULGATION OF SBAS LINES OF MINMA

- **PANS OPS VOL. II IFPP/10 AMENDMENT**
 - LP
 - APV-I LPV DA
 - APV-II LPV DA
 - SBAS PA LPV DA
- **WHAT ABOUT CAT I NOTATION?**
- **TASK FOR IFPP INTEGRATION WORKING GROUP**



CONSOLIDATION OF AVP-I AND APV-II CRITERIA

Typical Ops	Accuracy Hor. 95%	Accuracy Ver. 95%	Integrity	Time-to Alert	Continuity	Availability
APV-I	16m	20m	1-2x10 ⁻⁷	10 Sec	1-2x10 ⁻⁷	0.99 to 0.99999
APV-II	16m	8m	1-2x10 ⁻⁷	6 Sec	1-2x10 ⁻⁷	0.99 to 0.99999
CAT I	16m	4m to 6m	1-2x10 ⁻⁷	6 Sec	1-2x10 ⁻⁷	0.99 to 0.99999

Only Differences Vertical Accuracy and Time to Alert

With Combined APV-I and APV-II Vertical Accuracy is not the Issue

APV	16m	8m	1-2x10 ⁻⁷	10 Sec	1-2x10 ⁻⁷	0.99 to 0.99999
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MEETING SCHEDULE LEADING TO IFPP/11

- IWG ~ NEUW ISENBERG, GERMANY 25-29 JUNE
- PBN WG ~ VIRTUAL MEETING JULY
- ATM ~ MEETINGS VIA CORRESPONDENCE
- MWG ~ 19-21 JUNE LOCATION TBD
- HWG ~ VIRTUAL MEETING TBD
- QA ~ MEETINGS VIA CORRESPONDENCE
- CRM ~ TBD

- IFPP/11 MONTREAL, CANADA SEPTEMBER 2012



Questions



MWG IFPP/10 ACCOMPLISHMENTS

- **MOC REDUCTION IN A TURN**
- **IMPLEMENTATION OF THE VISUAL SEGMENT SURFACE**
 - Analogous to TERPS GQS
- **TEMPERATURE COMPENSATION FOR MOCA**
- **VOL. II BARO-VNAV CHAPTER REWRITE**
 - Step Changes at 5,000' and 10,000' in Obstacle Clearance
 - Application of ASE and ISAD from VEB?



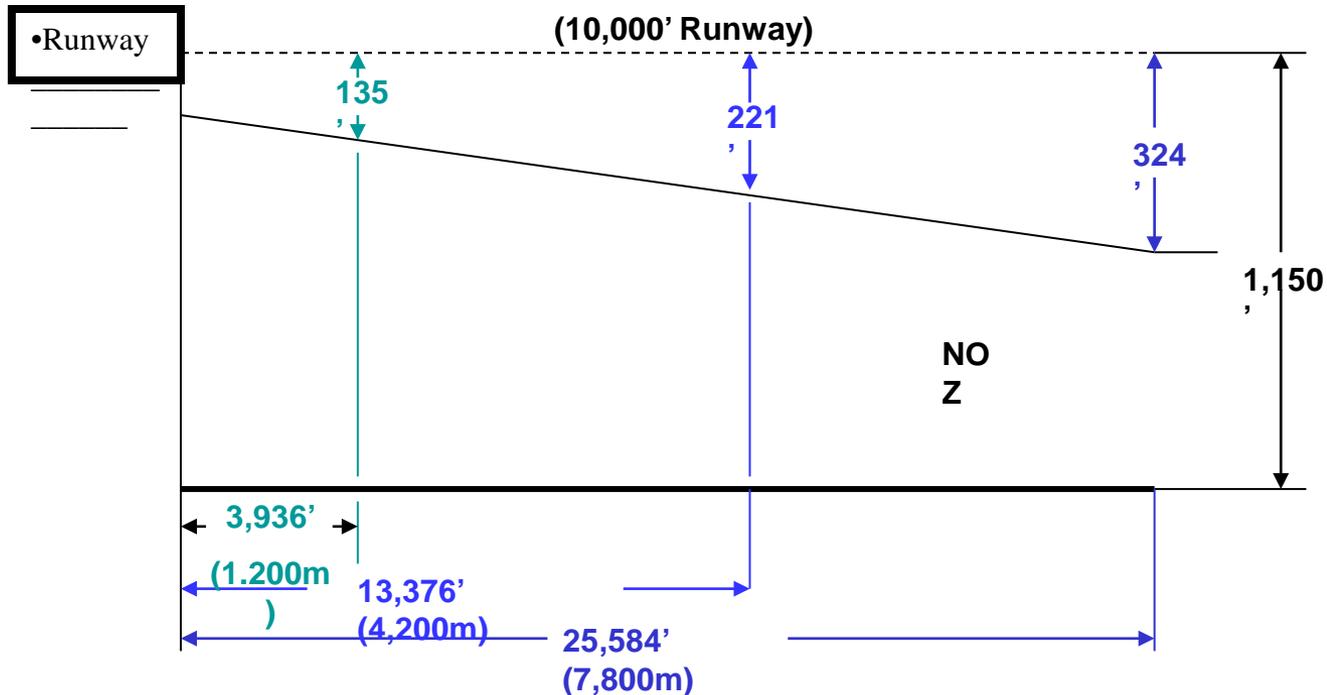
MWG IFPP/10 ACCOMPLISHMENTS

- **REMOVAL OF SIMULTANEOUS PARALLEL APPROACH RESTRICTIVE LANGUAGE FOR SBAS AND GBAS ~ APPROVED**
- **REDUCTION OF HL FOR FINAL SEGMENTS WITH VERTICAL GUIDANCE**
- **ADOPTION OF METHODOLOGY OF CALCULATING OBSTACLE EFFECTS FOR SIDE SURFACES IN MISSED APPROACH FOR VERTICALLY GUIDED APPROACHES**



NOMINAL SBAS FINAL APPROACH TRACKING PERFORMANCE

NOMINAL (95%) MANUAL FLIGHT LATERAL FTE PERFORMANCE



IFPP/10 SIMULTANEOUS PARALLEL APPROACHES

When it is intended to use a GBAS approach procedure to parallel runways, simultaneously with ILS, MLS, SBAS or another GBAS approach procedure, the following additional criteria shall be applied in the design of both procedures:

a)

Similar wording for SBAS

MWG IFPP/11 PLANS

- **COMPLETE REDRAFT OF VOL. II BARO-VNAV CHAPTER**
- **PROVIDE WP SHOWING TERPS GQS FLEXIBILITY WHEN COMPARED WITH PANS OPS VISUAL SEGMENT SURFACE**
- **BEGIN PREPARATION OF GBAS FAS DATA BLOCK AMENDMENT FOR PANS OPS VOL. II**
- **INTRODUCE NEW TASK IN RESPONSE TO IFPP/5 PAPER**
 - **Simultaneous Converging Approaches with SBAS & GBAS**
 - **ATM Task**



PBN ~ NC WG IFPP/10 ACCOMPLISHMENTS

- AMENDMENT TO PANS OPS PERMITTING SBAS LPV USE OF ILS OBSTACLE CLEARANCE SURFACES, ILS CAT I OAS and CRM ACCEPTED AFTER 5 YEARS
- AMENDMENT TO PANS OPS TO PROVIDE CONSISTENCY WITH ANNEX 10 AMENDMENT 85 ACCEPTED
- SBAS LP CRITERIA AMENDMENT ACCEPTED
- REWRITE OF PANS OPS RNP CRITERIA IN PROGRESS
- DMAS CALCULATION FOR MISSED APPROACH RNP < 1.0 ADOPTED



SBAS LP SURFACES

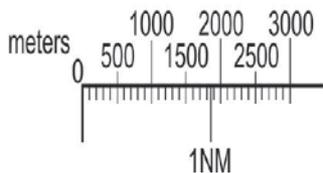
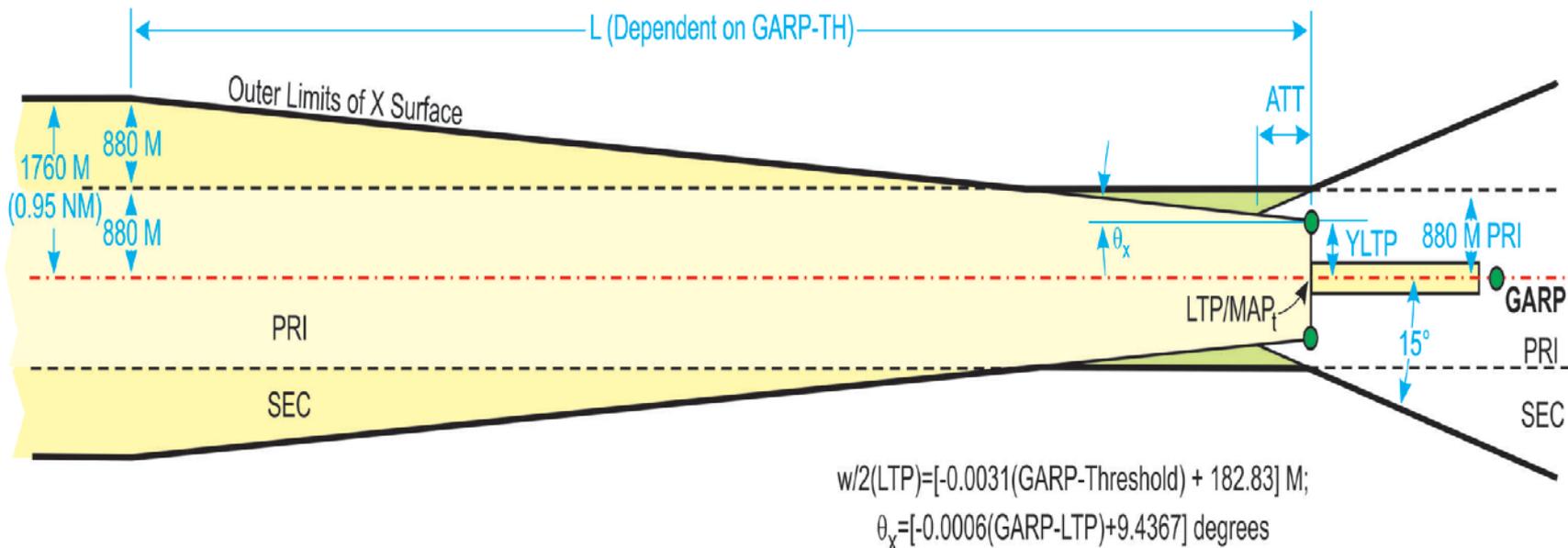
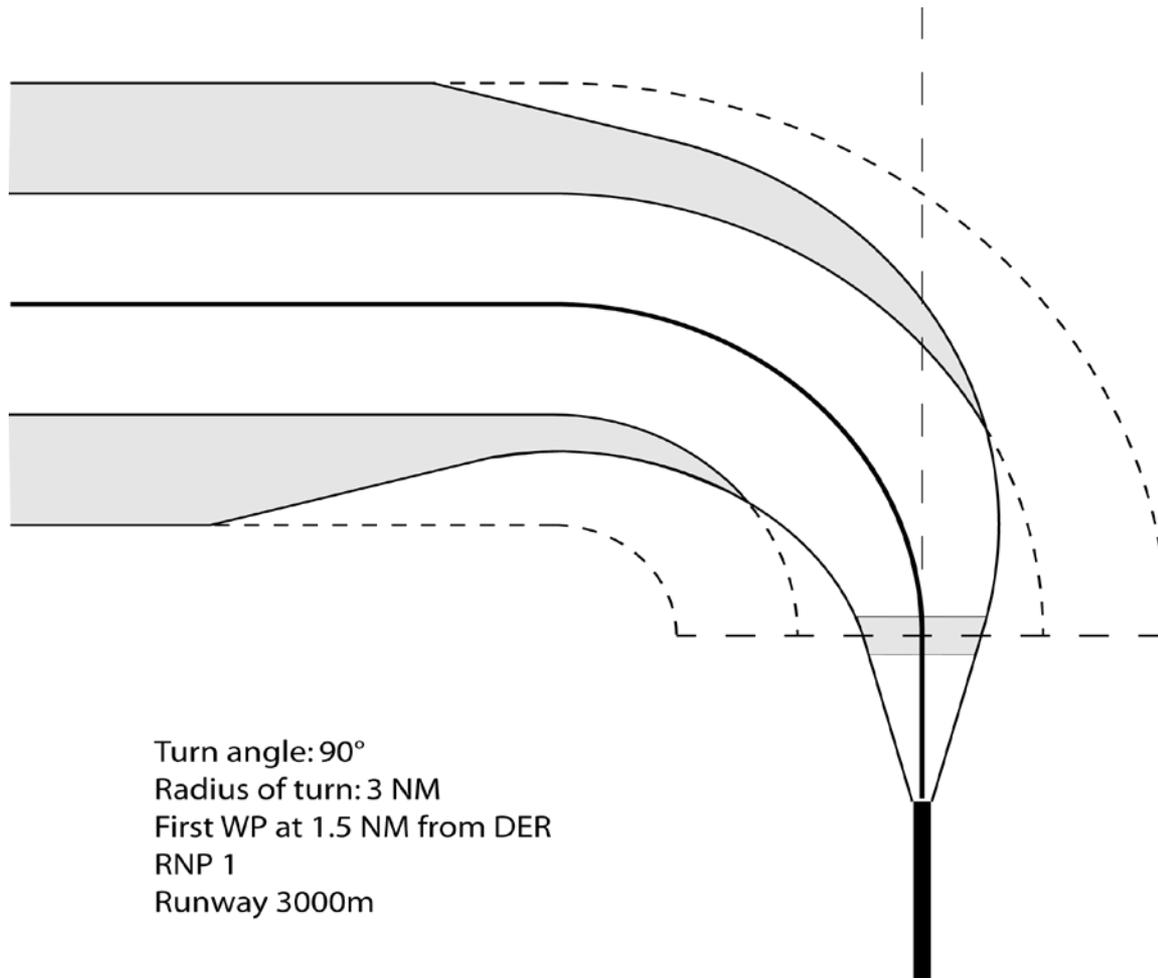


Figure 1: MAP_t at LTP (LP). Final area reaches 0.95 NM semi-width closer to LTP than FAF.

DEPARTURE RF TURN AREA



Turn angle: 90°
Radius of turn: 3 NM
First WP at 1.5 NM from DER
RNP 1
Runway 3000m

PBN ~ WG IFPP/10 ACCOMPLISHMENTS

• RF LEG TO FAF CRITERIA

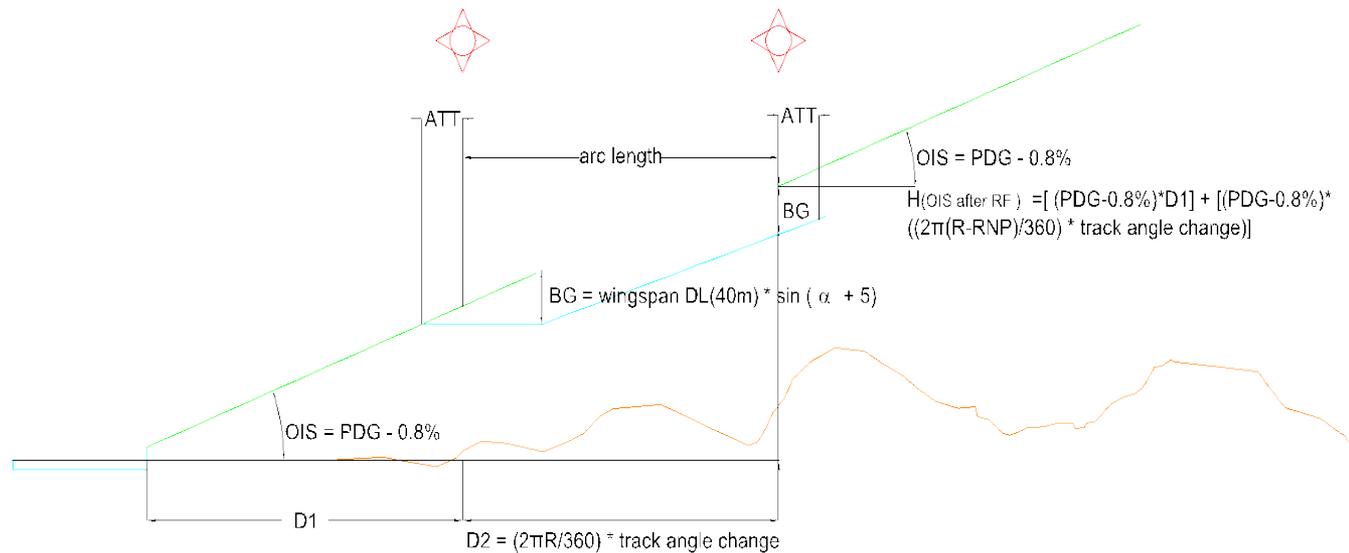
- SBAS Intermediate Segment Completed ~ RF Terminating at the SBAS FAF
- GNSS Intermediate Segment Requires 2 NM Extension Beyond ILS FAF ~ Awaits Input from ICCAIA

• IP'S

- WAAS Status Report
 - Performance During January 21-23 Iono. Storm
- SBAS Equipage Report
- Consolidation of Technical Details to Support SBAS LPV Use of ILS Surfaces



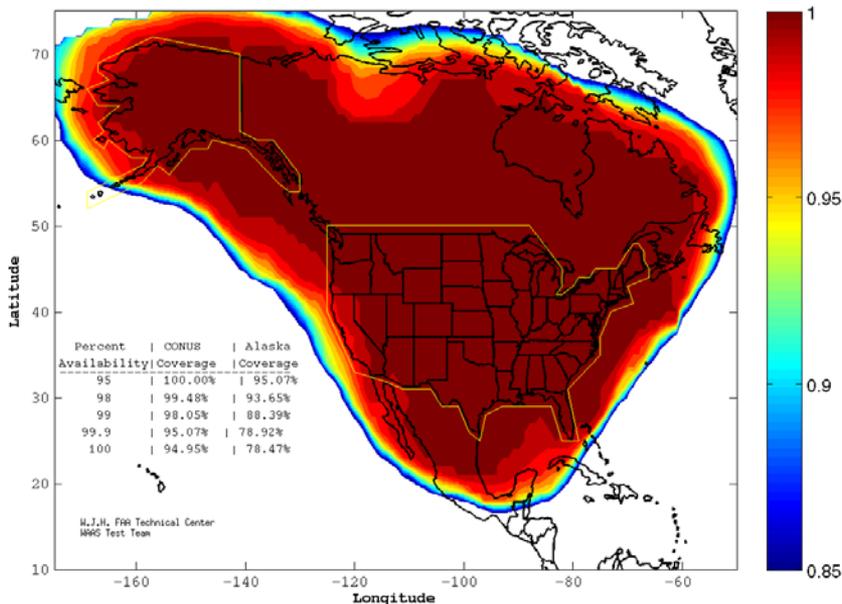
RF LEG SURFACES ~ NOT JUST A BENT STRAIGHT SEGMENT



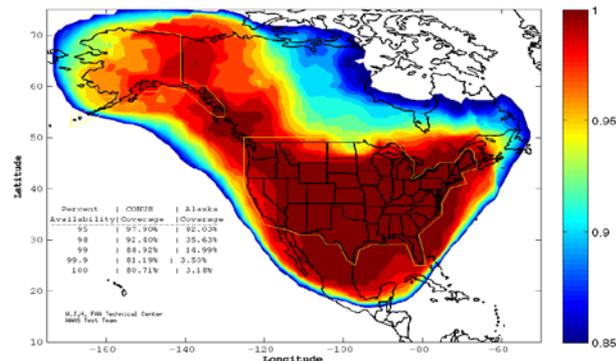
WAAS STORM PERFORMANCE

LPV200 Coverage Jan 21 & Jan 22-23

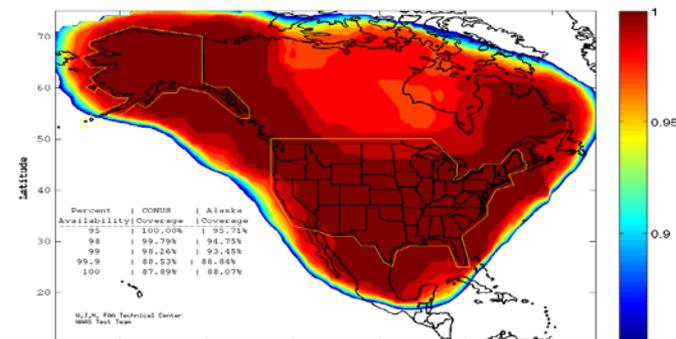
WAAS LPV200 Coverage Contours
01/21/12
Week 1671 Day 6



WAAS LPV200 Coverage Contours
01/22/12
Week 1672 Day 0



WAAS LPV200 Coverage Contours
01/23/12
Week 1672 Day 1



PBN ~ WG IFPP/11 PLANS

- **PREPARE TEXT TO POPULATE DOC 8168 VOL. II, PART III, SECTION 1, CHAPTER 6 ~ GBAS**
- **COLLABORATE WITH EUROCONTROL AND US NSP MEMBER ON APV TERMINOLOGY**
 - **Consolidation of APV-I and APV-II Criteria**
 - **Elimination of the Term APV?**
- **MONITOR REDRAFTING OF RNP CRITERIA**
- **COMPLETION OF RF LEG TO FAF CRITERIA AND MISSED APPROACH CRITERIA**
- **PREPARE SBAS LPV DOC 8168 VOL. I MATERIAL**



SBAS DOC 8168 VOL. I MATERIAL

• PREPARE SBAS TEXT FOR FOLLOWING CHAPTERS

- Part II, Section 1, Chapter 4 General Information for Satellite Augmentation System (SBAS)
- Part II, Section 2, Chapter 2 Area Navigation Departure Procedures with SBAS
- Part II, Section 3, Chapter 4 Arrival and Approaches with SBAS
- Part II, Section 5, Chapter 2 SBAS Precision Approaches (New Chapter)



HWG IFPP/10 ACCOMPLISHMENTS

- **FINALIZED PinS LPV CRITERIA FROM IFPP/9 (EDITORIALS)**
- **CHARTING OF Helicopter PinS APPROACH MANEUVERING VISUAL SEGMENTS**
 - Annex 4
 - Doc 8697
- **CHARTING OF Helicopter PinS DEPARTURE MANEUVERING VISUAL SEGMENTS**
 - Annex 4
 - Doc 8697
- **INTRODUCTION OF Helicopter PinS LPV CHARTING CONCEPTS**



HWG IFPP/11 PLANS

- COLLABORATE WITH IWG AND FINALIZE **Helicopter** PinS LPV CHARTING AND PROMULGATION AMENDMENTS

- Annex 4
- Annex 15
- Doc 8697
- PANS ABC

- REVIEW RNP 0.3 CRITERIA FOR APPLICABILITY TO ALL HELICOPTER PHASES OF FLIGHT



NSP INTERFACE TOPICS

- **COORDINATE THE POPULATION OF DOC 8168, VOL. II, PART III, SECTION 1, CHAPTER 6 ~ GBAS WITH US NSP MEMBER**
- **SECRETARIAT ACTION: FOLLOW-UP ON CONSISTENCY BETWEEN ANNEX 10 and PANS OPS GENERAL CRITERIA ON ORIENTATION OF FTP TO LTP**
- **COORDINATE A WP WITH US NSP MEMBER ON BEST INDUSTRY PRACTICES FOR ENCODING THE SBAS FAS DATA BLOCK. GOAL: CONSISTENCY BETWEEN:**
 - **PANS OPS**
 - **Annex 10**
 - **ARINC 424**
 - **DO-229D Appendix D and Q**



NSP INTERFACE TOPICS

- **MONITOR SEPARATION OF SBAS AND GBAS FAS DATA BLOCK TEXT IN ANNEX 10**
- **OBTAIN LATEST INFORMATION ON GBAS FAS DATA BLOCK FOR CAT II/III**
- **PREPARE IP FOR NSP LISTING IFPP/10 ACCOMPLISHMENTS**
 - **Removal of PANS OPS Restrictive Language on Simultaneous Independent Parallel Approaches with SBAS and GBAS**
 - **Encoding of the SBAS FAS Data Block Runway # and RPI Fields for Circling Only Procedures**
 - **Establishment of the SBAS LPV Use of ILS Surfaces**
 - **Acceptance of SBAS LP Criteria**
 - **Recognition in Doc 8168 of SBAS Amdt. 85 to Annex 10**



NSP INTERFACE TOPICS

- **COMBINING APV-I AND APV-II INTO ONE LEVEL OF APV SERVICE**
- **NOTE 9 ANNEX 10 TABLE 3.7.2.4-1 STATES TERM IS NOT TO BE USED OPERATIONALLY**
 - **Term not in DO-229D**
 - **Term not in RNP APCH PART B Navigation Specification**
 - **Elimination Simplifies Approach Classification**
 - **Not Used in Charting and Annunciations**
- **FIRST ACTION: COMBINE APV-I and APV-II CRITERIA & ELIMINATE SBAS CAT I AND APV-II CRITERIA OVERLAP**
 - **One Set of APV OAS Tables**
 - **Use of Modified CRM**

