



1er Taller PANS-OPS (SAM/PANS-OPS/1) Información del Miembro del IFPP



FERNANDES JR – DECEA/BRASIL

TEMA	Expositor	Tiempo	Organización
Información del Miembro del Flight Procedure Panel (IFPP) <ul style="list-style-type: none"> - SID RNP AR: no hay NAVSPEC y criterios de diseño de procedimientos (solamente en 2018). - Manual de mantenimiento RNP AR: nueva edición lista para publicación (hasta 2016). - Restricciones de la VSS: debe ser menos restrictiva y permitir penetraciones. 	Fernandes Jr.	30 min	DECEA/Brasil
Concepto de Transición para la Identificación de SID y STAR.	Fernandes Jr.	30 min	DECEA/Brasil
Procedimientos instrumentales PBN públicos / Otros criterios de aprobación (tailored).	Fernandes Jr. (RNP AR)	30 min	DECEA/Brasil
Unificación y publicación de las tablas de codificación.	Fernandes Jr.	30 min	DECEA/Brasil
Publicación de los procedimientos RNP AR.	Fernandes Jr.	30 min	DECEA/Brasil

OBJETIVO

- ➔ Conocer el Panel de Procedimientos de Vuelo por Instrumentos (IFPP) de la OACI.

TEMARIO

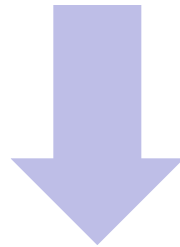
- ➔ ¿Qué es IFPP?
- ➔ ¿Cómo funciona el IFPP?
- ➔ ¿Cuáles son los temas desarrollados por el IFPP?

¿IFPP?



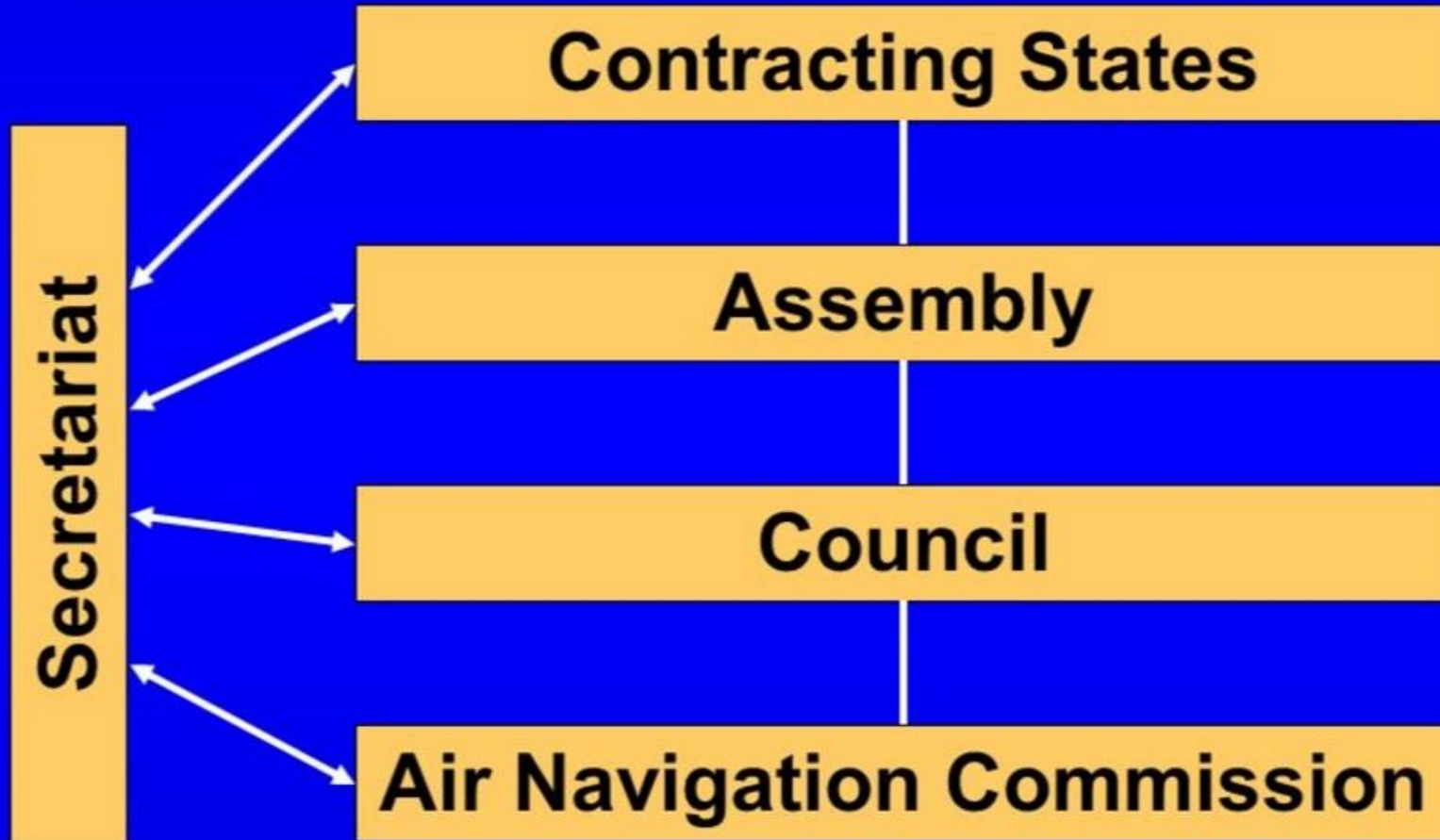
INSTRUMENT FLIGHT PROCEDURES PANEL (IFPP)

Desarrollar estándares (PANS-OPS, Doc 8697, Doc 9905 y Doc 9906)



Mayor seguridad, eficiencia, capacidad, accesibilidad

ICAO Structure



AIR NAVIGATION COMMISSION (ANC)



[ICAO / About ICAO / Air Navigation Commission](#)

[How ICAO Develops Standards](#)

[ANC Technical Panels](#)

[Air Navigation Work Programme](#)

Air Navigation Commission

The Air Navigation Commission (ANC) considers and recommends Standards and Recommended Practices (SARPs) and Procedures for Air Navigation Services (PANS) for adoption or approval by the ICAO Council.

INSTRUMENT FLIGHT PROCEDURES PANEL (IFPP)

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How ICAO Develops Standards

ANC Technical Panels

Air Navigation Work Programme

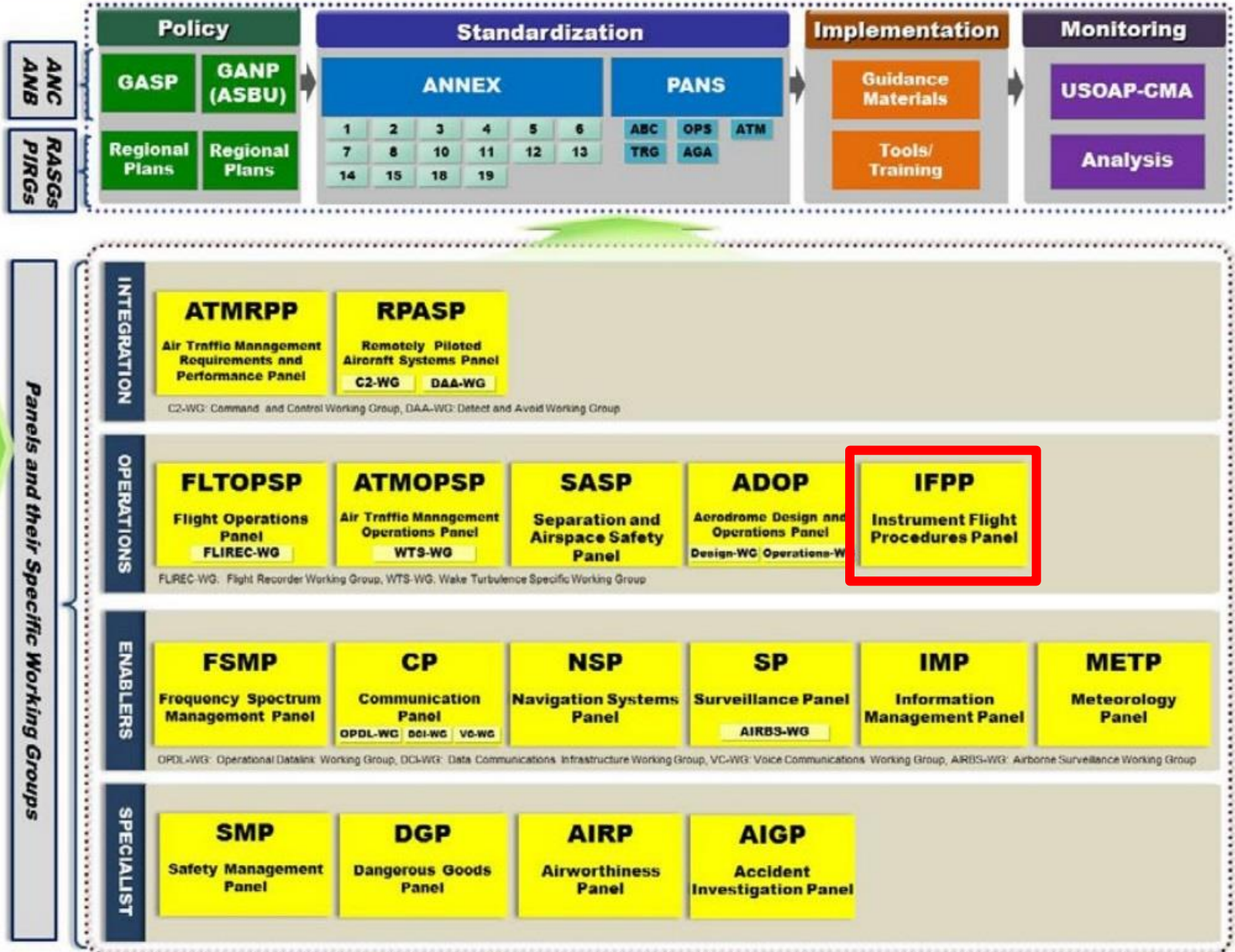
ANC Overview Brochure

ANC Technical Panels

To ensure all new or improved SARPs and PANS will be effective and practical for end-users, the ANC works through established panels of experts in various disciplines who are assigned specific tasks from the overall work programme. It also takes advantage of the expertise within States and international organizations to develop its technical proposals.

ICAO AIR NAVIGATION WORK SYSTEM

Air Navigation Work Programmes



Instrument Flight Procedures Panel (IFPP)

The Obstacle Clearance Panel (OCP) was established in 1966, and renamed to the Instrument Flight Procedures Panel (IFPP) in 2007 to address new capability such as performance-based navigation (PBN) as well as the emerging requirements for increased accuracy, the use

of automation, the need for quality assurance and the consideration of environmental issues in instrument flight procedure designs. The IFPP undertakes specific studies and develop technical and operational ICAO provisions for instrument flight procedure design and associated domains.



INSTRUMENT FLIGHT PROCEDURES PANEL (IFPP)

DESCRIPCIÓN

Instrument Flight Procedures Panel	<p>Develop and maintain flight procedures SARPs and guidance material (e.g., PANS-OPS, Docs 8697, 9905 and 9906) leading to enhanced safety, increased terminal airspace capacity and utilization, improved airport/heliport accessibility in all weather conditions, and more efficient transitions to/from en-route airspace.</p> <p>Specifically this includes:</p> <ul style="list-style-type: none">a) new instrument flight procedure (IFP) design criteria to address improvements in air navigation, evolving aircraft capabilities and new operational concepts;b) instrument flight procedure oversight requirements;c) harmonization of charting criteria, databases, and avionics systems guidance with IFP design standards and the facilitation of an efficient communication between ATC and Flight Crews;d) necessary consequential amendments to impacted Annexes and ICAO Documents as a result of changes to IFP design SARPs and criteria
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¿Cómo funciona el IFPP?



¿Cómo funciona el IFPP?

IFPP (OACI)
WG 1a PBN/New Criteria
WG 1c Helicopters
WG 1d Maintenance and Implementation
WG 2 Integration
WG 3 ATM
WG 4 Quality Assurance
WG 5 CRM Development
WG 6 Operations
Aerodrome Task Force

- Reuniones plenarias (2x año)
- Reuniones de los subgrupos
- Ciclos de trabajo (4 reuniones)
Septiembre 2016 cierra el ciclo 13
- Representantes de los Estados y otras organizaciones (Jeppesen, FAA, IFALPA, Boing, ICCAIA)

¿“IFPP” BRASILEÑO?

¿“IFPP” BRASILEÑO?

IFPP (OACI)

WG 1a PBN/New Criteria

WG 1c Helicopters

WG 1d Maintenance and
Implementation

WG 2 Integration

WG 3 ATM

WG 4 Quality Assurance

WG 5 CRM Development

WG 6 Operations

Aerodrome Task Force

PPNA (DECEA/Brasil)

Criterios PANS-OPS

Normas, Documentación

Cursos y Capacitación

Proyectos y Implementación

DECEA
(ANC)

PPNA
(IFPP)

¿Oficina de Lima (ANC)
Panel Regional (IFPP)?

¿Cómo funciona el IFPP?

Doc 7984/5

Doc 7984/5



Inst
a los
Com

Instrucciones relativas a los grupos de expertos de la Comisión de Aeronavegación

Aproba
y publicadas con su autorización

Quinta edición — marzo de 2014

Organización de Aviación Civil Internacional

¿Cómo funciona el IFPP?

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4.

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JOBCARDS !?

JOB CARDS

ANWP Job-card

Title	Development of new Performance Based Navigation design criteria to support current and future PBN operations.	Reference:	IFPP.008.01
Source	IFPP		

WPE No.	Document affected	Description of Amendment proposal or Action	Supporting Expert Group	Expected dates:		
				Expert Group	Effective	Applicability
341	Proposed amendments to Doc 8168 (Pans-Ops) Volume I	Develop provisions for the application of RNAV/RNP to (and from) xLS transitions for the guidance of flight operations personnel and flight crew.		Completed	Jul 2016	Q4 2016
342	Proposed amendments to Doc 8168 (Pans-Ops) Volume II	Develop design criteria for the application of RNAV/RNP to (and from) xLS transitions		Completed	Jul 2016	Q4 2016
1586	Proposed amendments to Doc 8168 (Pans-Ops) Volume I	Develop provisions for the application of approach procedures utilizing SBAS with barometric vertical navigation for the guidance of flight operations personnel and flight crew.		Q4 2015	Jul 2018	Nov 2018
1587	Proposed amendments to Doc 8168 (Pans-Ops) Volume II	Develop design criteria for the application of approach procedures utilizing SBAS with barometric vertical navigation		Q4 2015	Jul 2018	Nov 2018
349	Proposed amendments to Doc 9905 (RNP AR Design Manual)	Develop provisions for RNP AR departure procedures		Q4 2015	Jul 2018	Q4 2018
Initial Issue Date: 12 Novemeber 2014		Date approved by ANC: 12 Novemeber 2014	Session/Meeting: 197-10			

Reference Documents	Doc 8168 (PANS-OPS) Vol. I, Annex 6	Attachments
Primary Expert Group:	IFPP	

IFPP11 Provision of inf for the strat devlpm of PBN

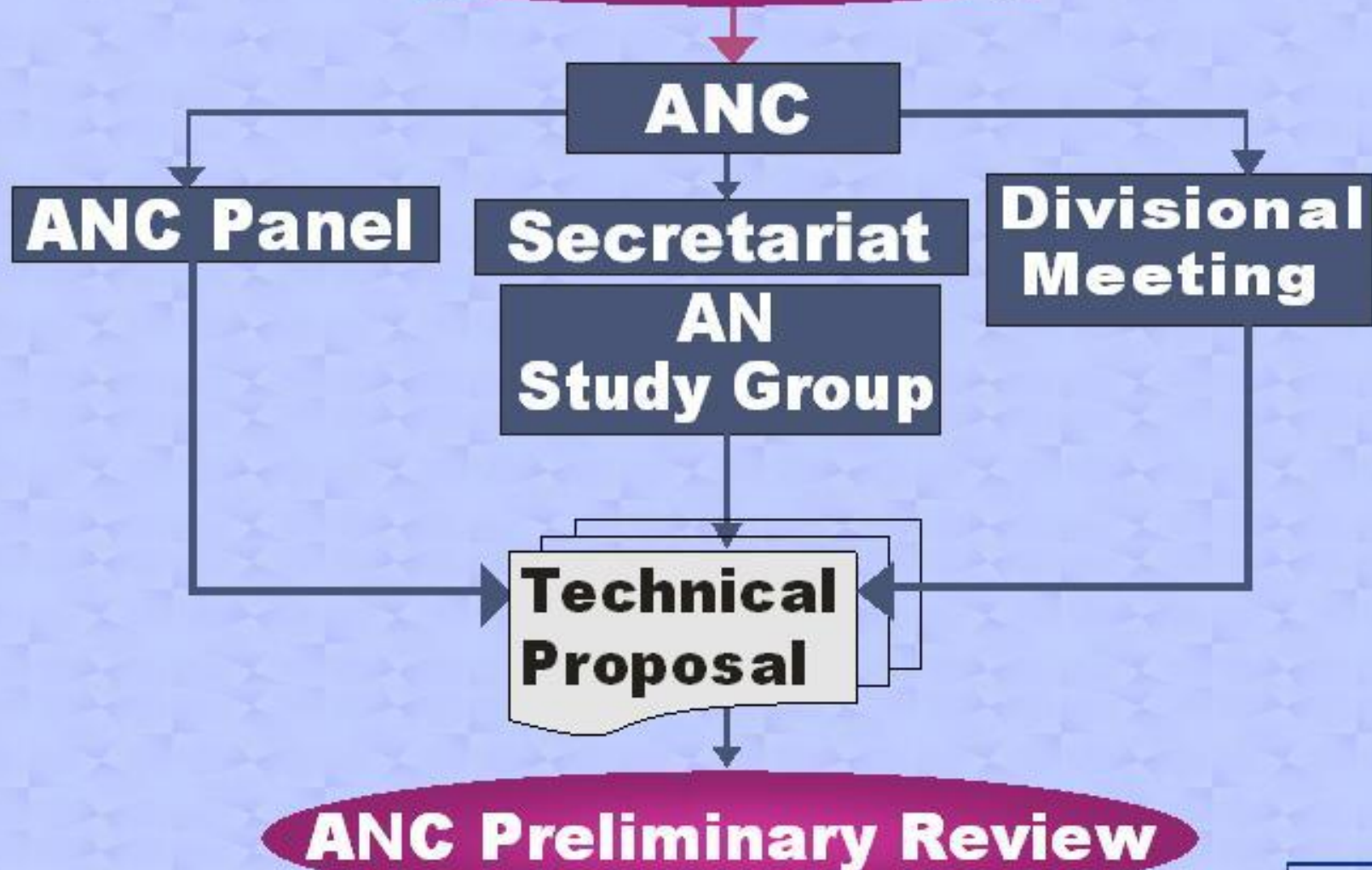
Origin of Proposal



Proposal for Action

Development Phase

Proposal for Action



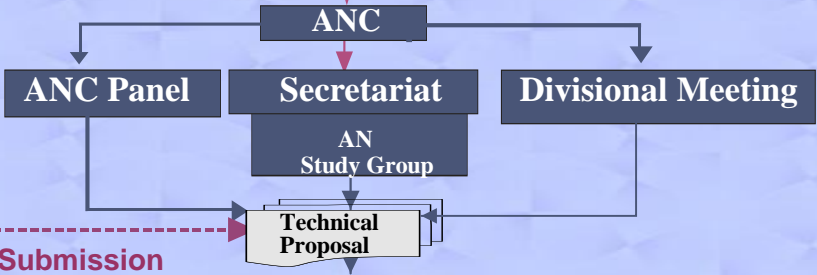
Origin of Proposal



Proposal for Action

Development Phase

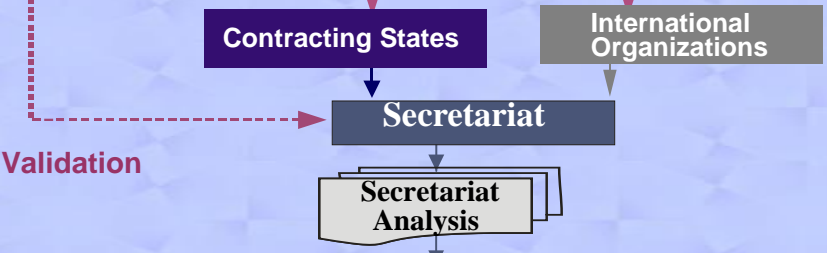
0 - 5 years



ANC Preliminary Review

Review Phase

3 Months



10 Months Approximately

ANC Final Review

Adoption/ Publication Phase

Approximately 2 years



(Usually March)

Adoption Date

2 weeks

4 Months

Effective Date

4 Months minimum

(Usually November)

Applicability Date

¿Cuáles son los temas desarrollados por el IFPP?



TEMAS DESARROLLADOS POR EL IFPP

APPENDIX C

Action Item Check List

Action Item	Description	Action by	Deadline	Status
13-1/1	Visually Guided procedures: The IFPP Secretary to ensure the Job Card FLTOPSP.023.01 to be updated with the timeframes stated above (Q4 2017).	Secretariat	IFPP 13-2	overdue

- **5 páginas – 72 temas**
- **Ni todos son discutidos en las reuniones**
- **Muchos dependen de la interacción con otros WG**
- **Algunos están retrasados o suspendidos (falta expertos)**

	Annex 4 at IFPP/13 in fall 2016.			
	GBAS Text: The WG1a to present a mature			

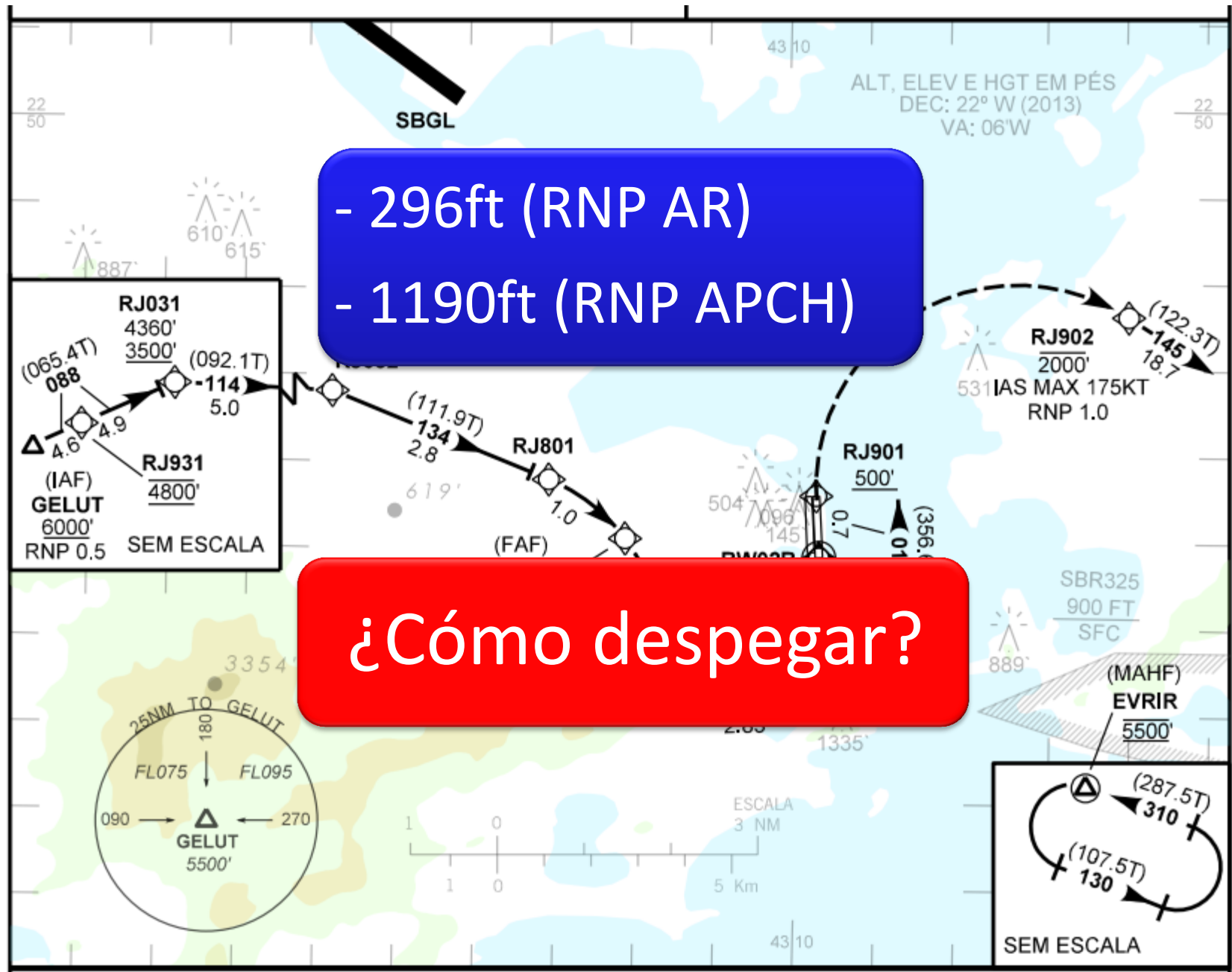
TEMA DE LA PRESENTACIÓN

TEMA	Expositor
<p data-bbox="34 448 1400 615">Información del Miembro del Instrument Flight Procedures Panel (IFPP)</p> <ul data-bbox="34 644 1197 882" style="list-style-type: none"><li data-bbox="34 644 465 701">- SID RNP AR<li data-bbox="34 733 1197 791">- Manual de mantenimiento RNP AR<li data-bbox="34 823 819 881">- Restricciones de la VSS	<p data-bbox="1464 611 1856 772">Fernandes Jr DECEA/Brasil</p>

TEMAS DESARROLLADOS POR EL IFPP

→ Salidas RNP AR

- Actualización del Manual RNP AR (DOC 9905)
- VSS – Clarificación y Aplicación
- Concepto de Transición (SID/STAR)



SALIDAS RNP AR

➔ Reunión IFPP (Marzo 2016):

NAVSPEC!!

iv. RNP AR Departure criteria

The initiation of work for RNP AR Departure is on hold waiting for the results of the PBNSG work on the specification. Meanwhile, with the availability of the scalable Advanced RNP criteria and the possibility of using RF segments on departures might solve the majority of the issues, which would have called for the AR departure criteria. At IFPP 12 the delivery date was set to Q4 2018 to reflect the above. It is planned that during the summer, more close working relationship (possible 9905 group joint meeting) with the PBNSG be established in relation to the Doc 9905 review, and to coordinate departure related issues already during their work on the specification.

RNP AVANZADA

RNP avanzada (ARNP): Se utiliza para apoyar operaciones RNP en espacio aéreo continental en ruta y en SID, STAR y procedimientos de aproximación. Los requisitos ARNP incluyen los valores siguientes para la precisión de navegación: 0,3 NM en la aproximación final; 1 o 2 NM en ruta continental; y una precisión de navegación de 1 NM en SID, STAR, y en aproximaciones iniciales o intermedias y en aproximaciones frustradas. Los requisitos opcionales incluyen aplicaciones para espacio aéreo oceánico/remoto y una opción para incrementos que permite cualquier valor de la precisión de navegación entre 1,0 NM y 0,3 NM, en incrementos de 0,1 NM, en todas las fases terminales del vuelo excepto en la aproximación final. Los criterios de franqueamiento de obstáculos se detallan en la Parte III, Sección 1, Capítulo 2, y Sección 3, Capítulos 1, 2, 3, 4, 7 y 8.

RF LEG

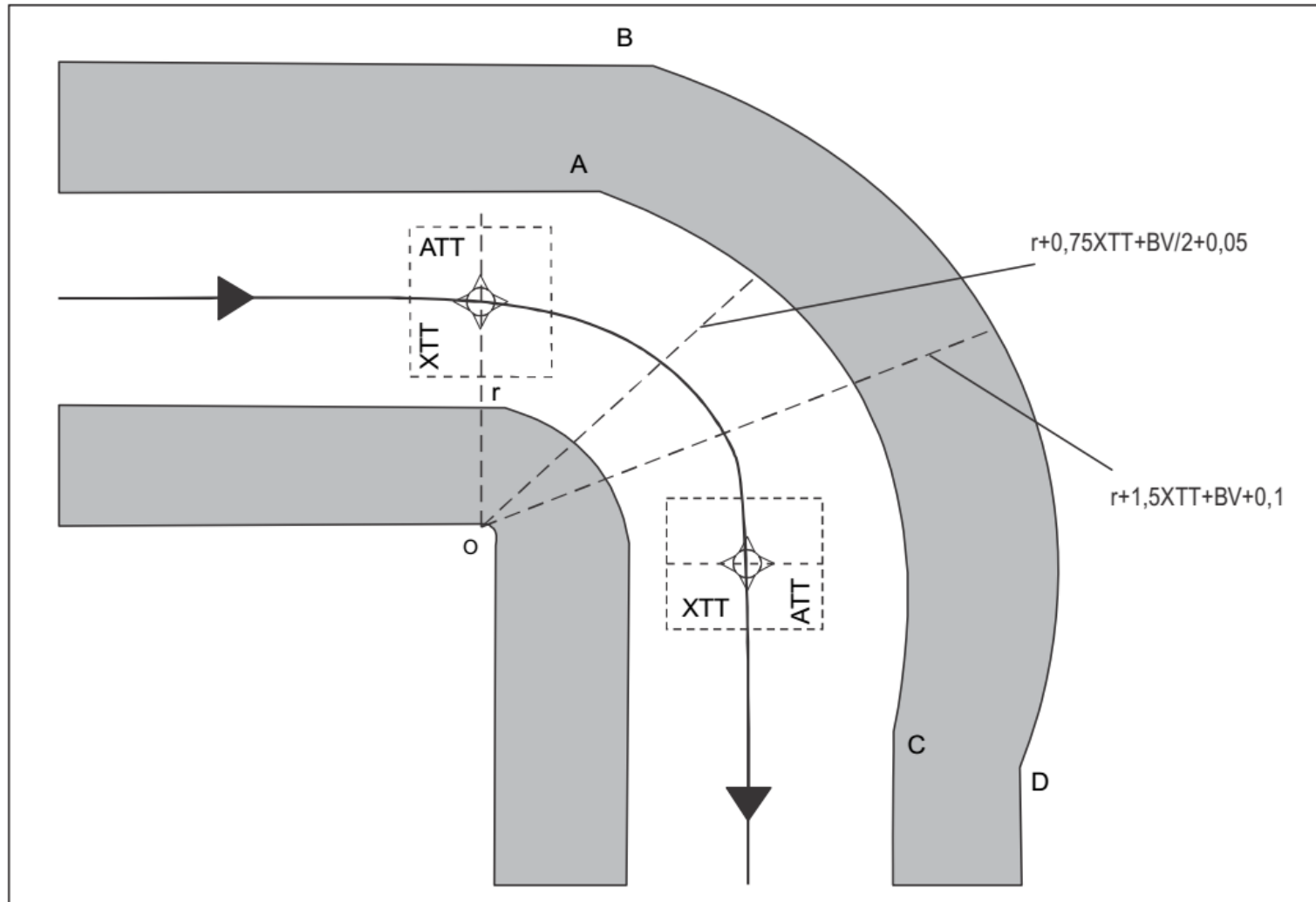
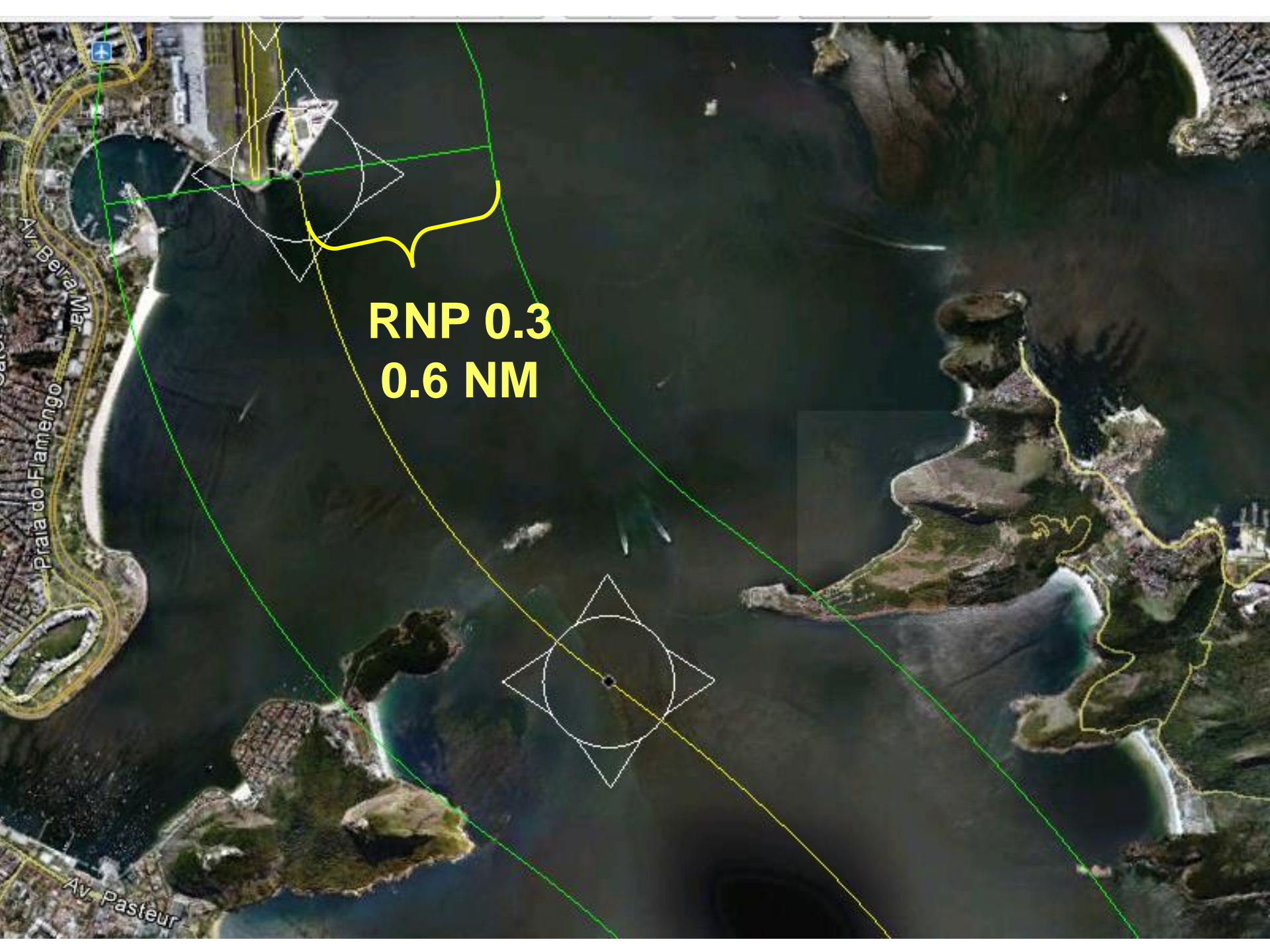


Figura III-2-2-13. Protección de viraje RF



RNP 0.3
0.6 NM

Av. Beira Mar
Praia do Flamengo

Av. Pasteur

SALIDAS RNP AR EN CHINA

✈ Reunión IFPP (Marzo 2016) >> China presentó WP

DEVIATION FORM THE DESIGN CRITERIA OF RNP AR IN ICAO DOC 9905

2.2.2 RNP value

- * RNP 0.3 is normal
 - ✧ 0.3 for missed approach
 - ✧ 0.3 for departure
 - ✧ 0.3 for arrival
 - ✧ 0.3 for approach

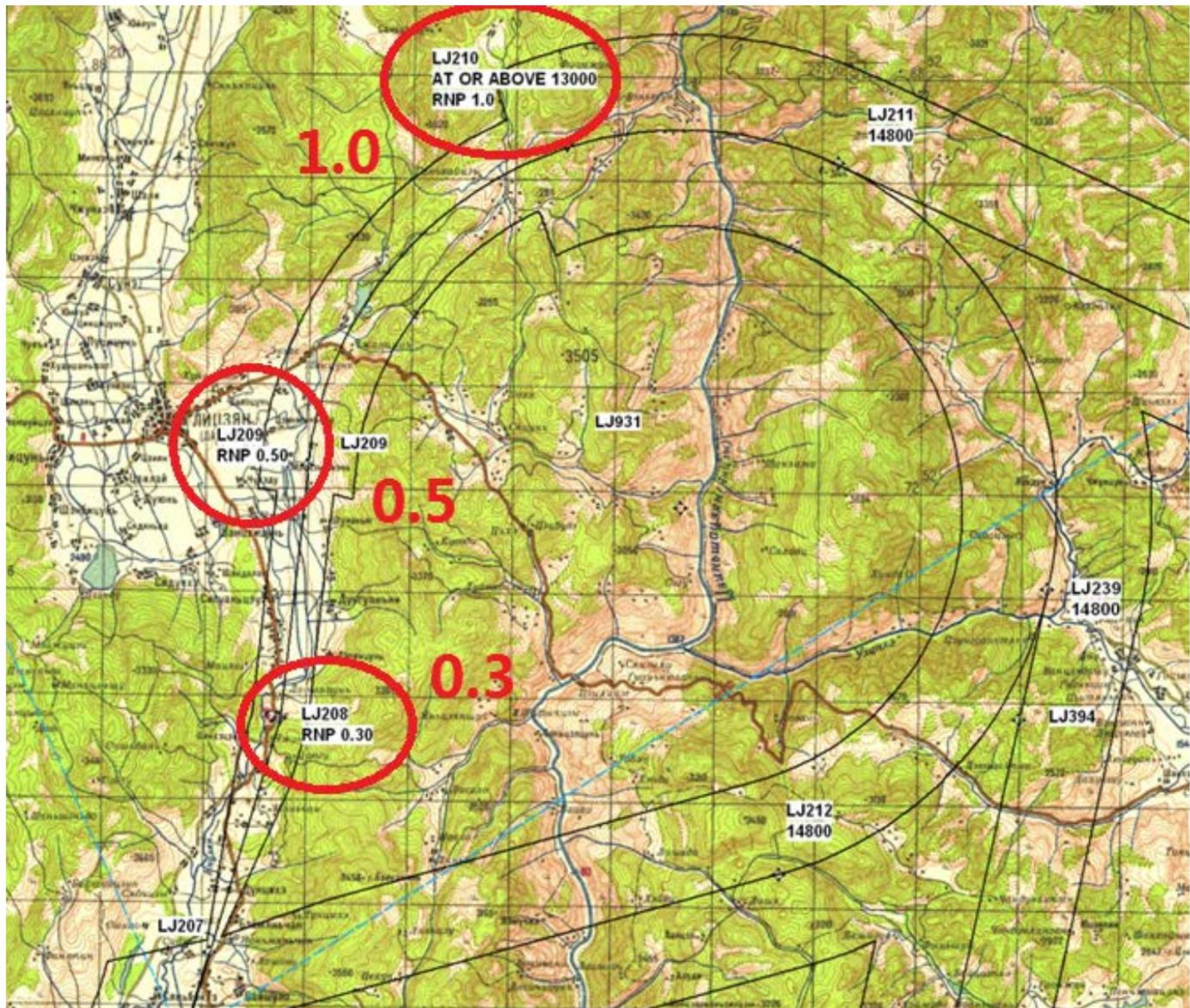
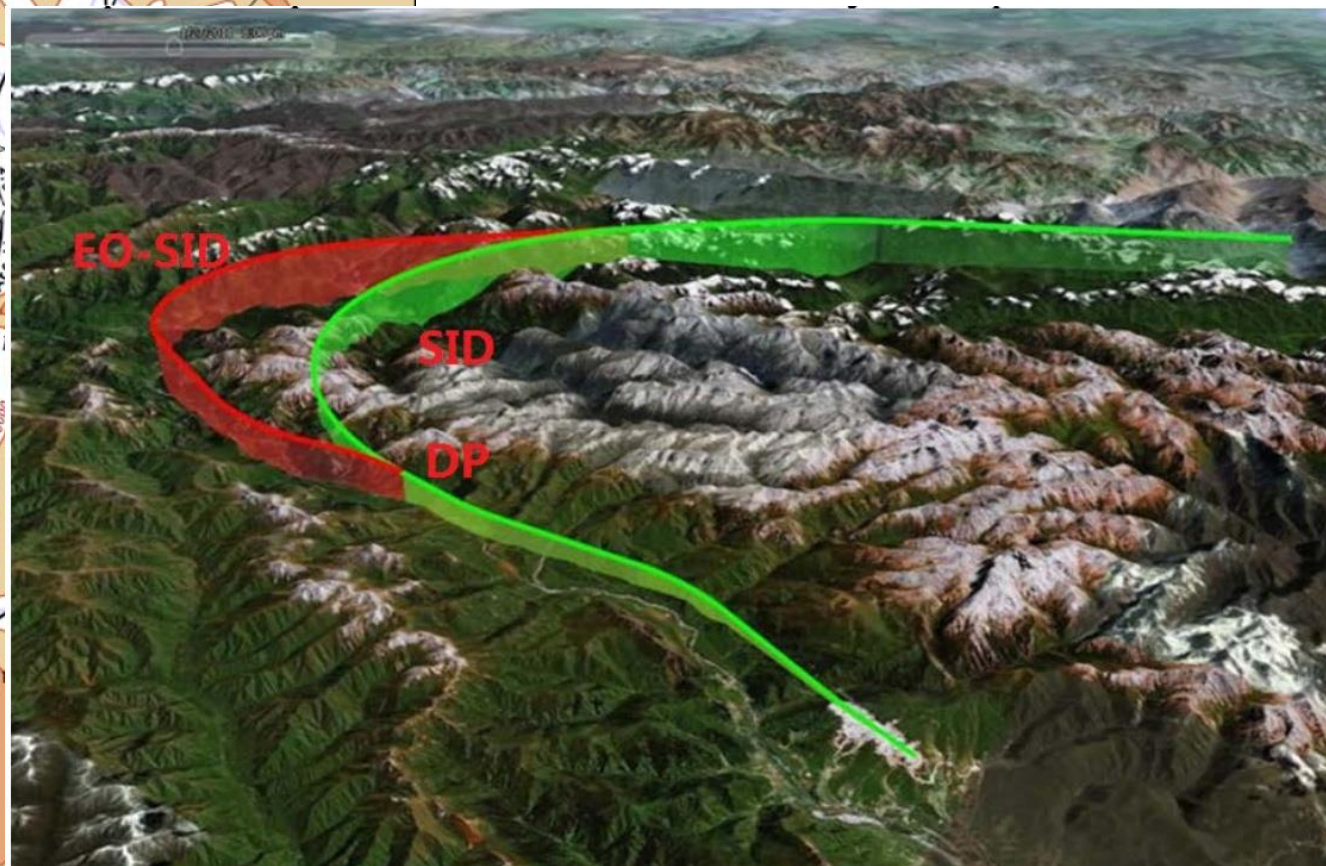
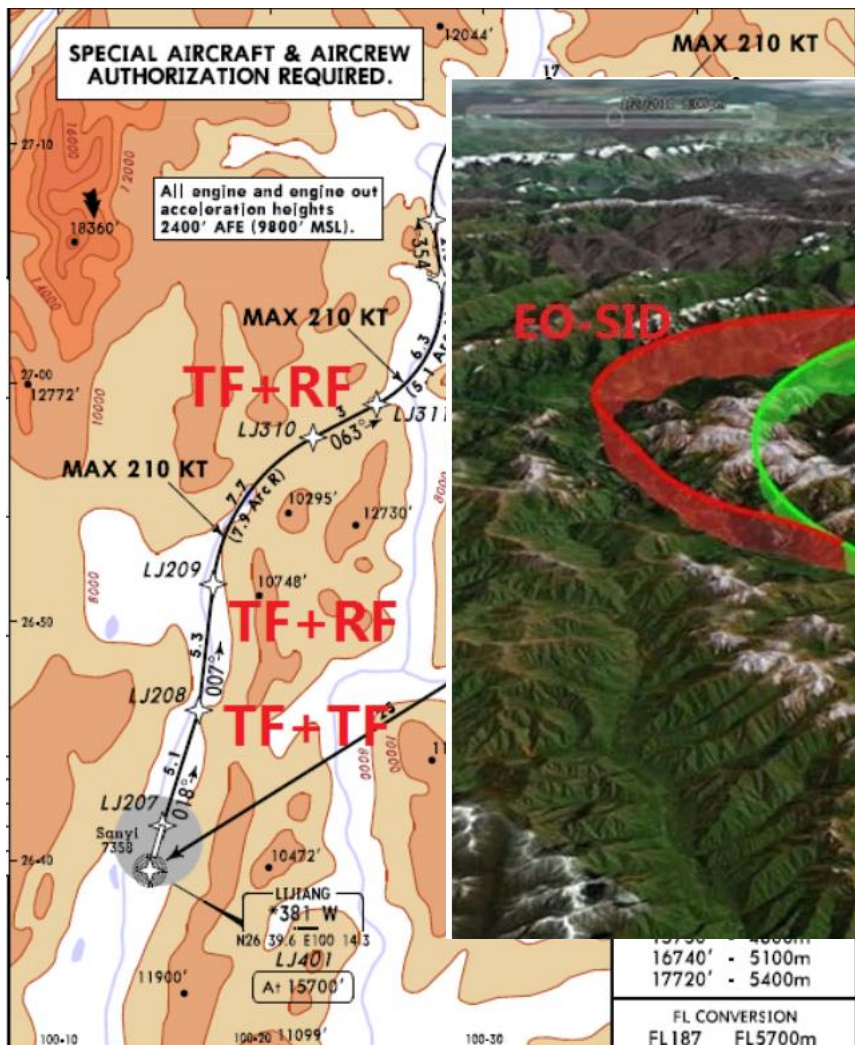


Figure 2 RNP values for RNP AR SIDs

SALIDAS RNP AR EN CHINA



15750'	4800m
16740'	5100m
17720'	5400m
FL CONVERSION	
FL187	FL5700m

SALIDAS RNP AR EN CHINA

3° Offset
initial track

6.25% splay

300ft semi-
width

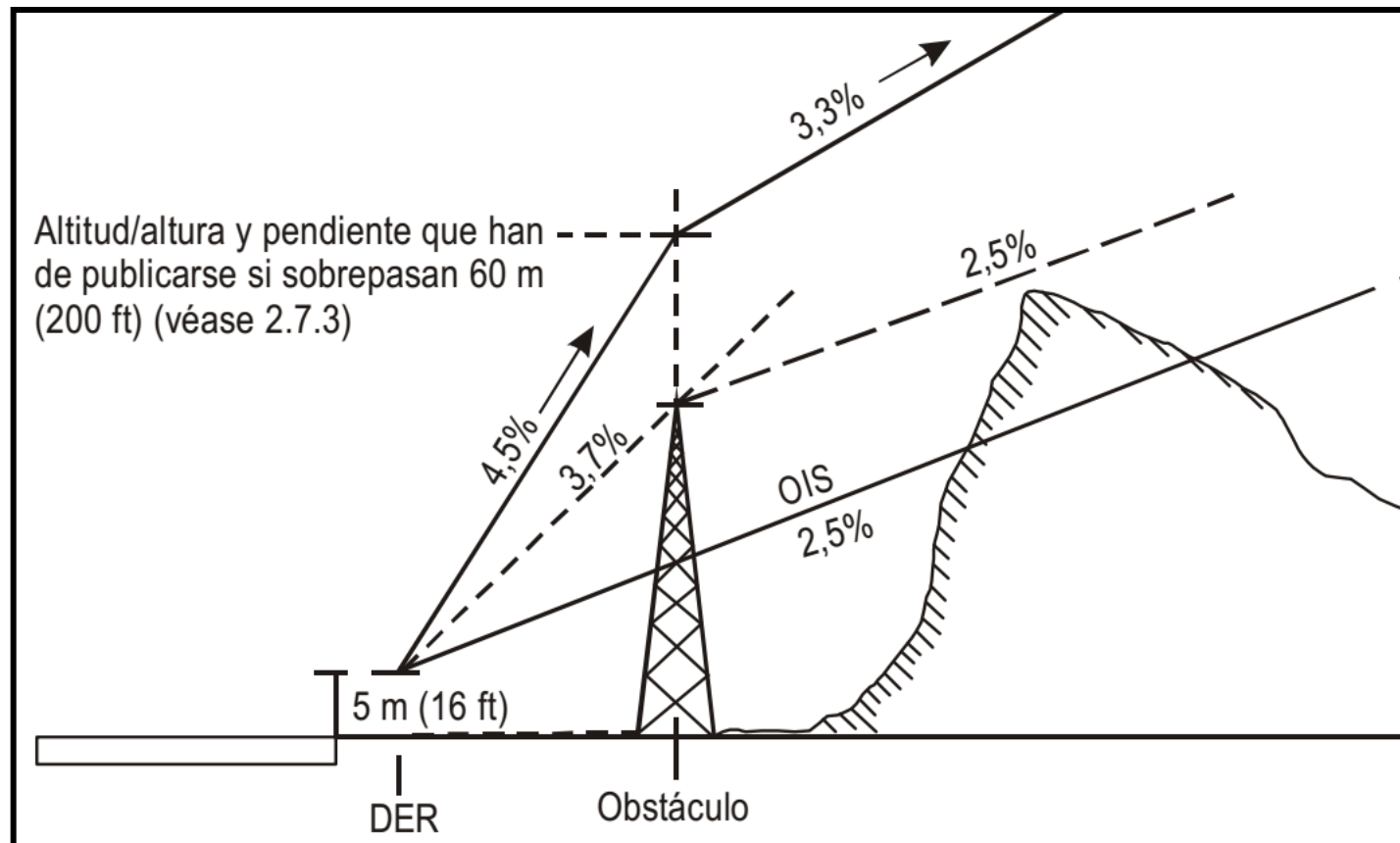
Hill removal
(2.23% → 1.6%)



Figure 7 RNP AR SID initial climb protections for Jiu-zhai airport

¿CRITERIOS OACI PARA SALIDAS RNP AR?

➔ Salidas PANS-OPS y criterios RNP AR para aprox. frustrada...

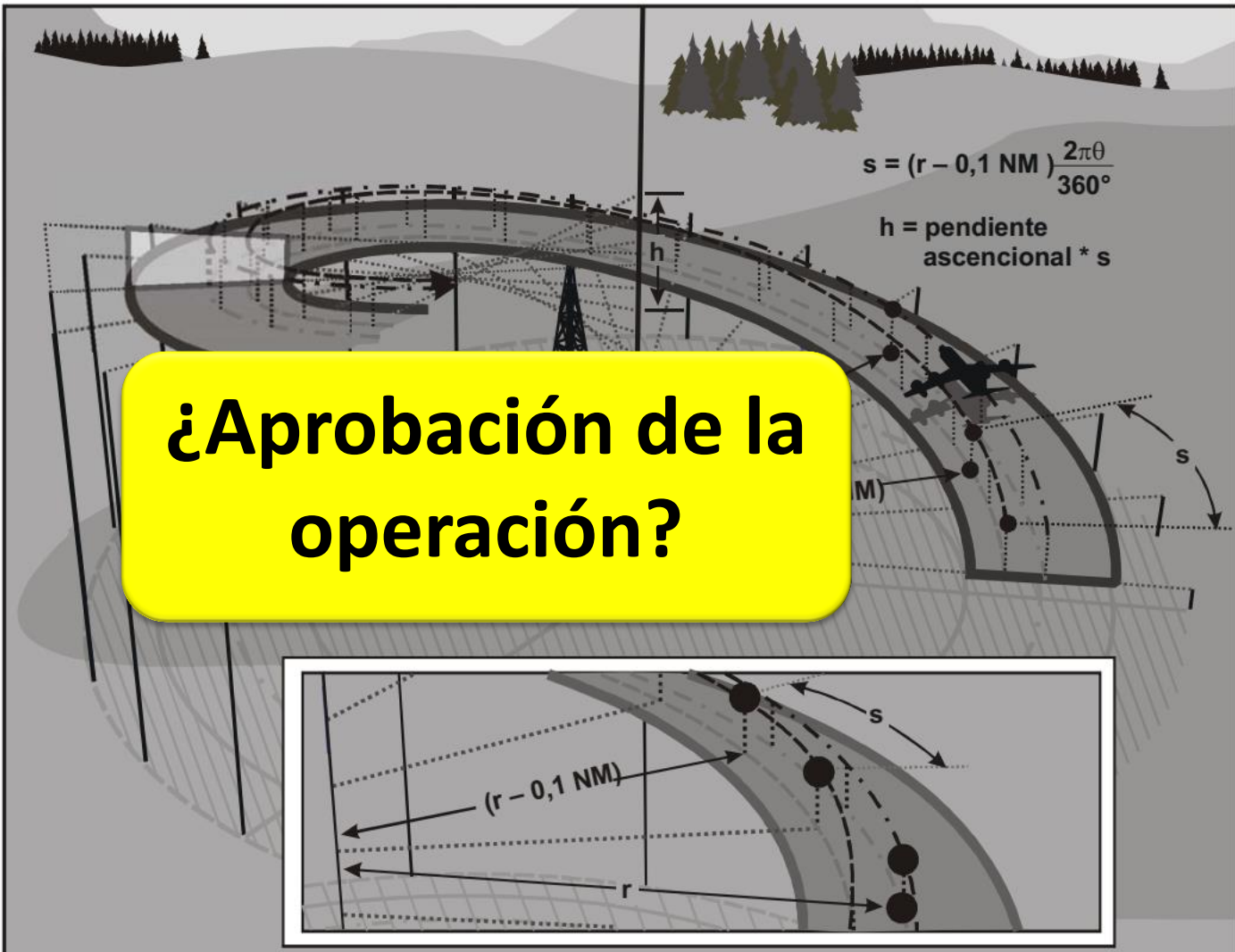


¿CRITERIOS OACI PARA SALIDAS RNP AR?

- VIRAJES (a)
- No bajo
- No antes
- RF Leg >

(Cat H, 45 m)

150 m
(Cat H, 45 m)



¿Aprobación de la operación?

Ángulo de derrota ($\leq 15^\circ$)

de derrota especificado

TEMAS DESARROLLADOS POR EL IFPP

- Salidas RNP AR
- Actualización del Manual RNP AR (DOC 9905)
- VSS – Clarificación y Aplicación
- Concepto de Transición (SID/STAR)

ACTUALIZACIÓN DEL MANUAL RNP AR (DOC 9905)

- ➔ DOC 9905 necesita de revisiones...
 - Inconsistencia con documentos de la OACI (PANS-OPS, Manual PBN, Anexo 6)
 - Aclarar las variables utilizadas en el documento
 - Mejorar las figuras
 - Armonizar los terminos
 - ...

La nueva versión está
siendo arreglada!

ACTUALIZACIÓN DEL MANUAL RNP AR (DOC 9905)

Approach Procedure with Vertical Guidance (APV). An performance-based navigation (PBN) instrument approach procedure which utilizes lateral and vertical guidance but does not meet the requirements established for precision designed for 3D instrument approach and landing operations Type A.

Note 2. – The required visual reference means that section of visual aids or of the approach area which should have been in view for sufficient time for the pilot to have made an assessment of the aircraft position and rate of change of position, in relation to the desired flight path. In Category III operations with a decision height the required visual reference is that specified for the particular procedure and operation.

ACTUALIZACIÓN DEL MANUAL RNP AR (DOC 9905)

Amend the formula in paragraph 3.2.9 to read:

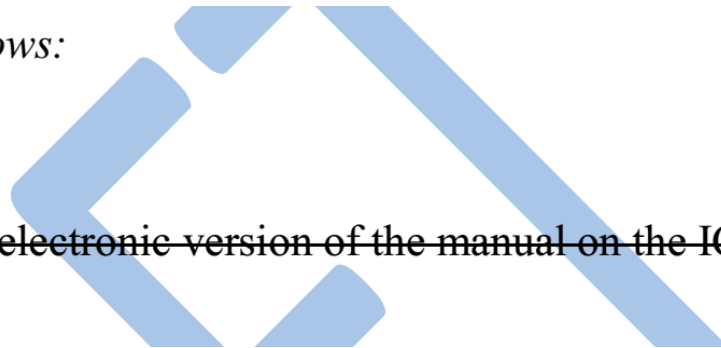
$$r = 37 / \tan(0.5 * \text{track change in degrees}) \text{ km}$$

$$r = 20 / \tan(0.5 * \text{track change in degrees}) \text{ NM}$$

Amend paragraph 4.5.10 header and text as follows:

~~FAP Calculator~~

~~An FAP calculator is available together with the electronic version of the manual on the ICAO website (www.icao.int) under “Publications”~~



ACTUALIZACIÓN DEL MANUAL RNP AR (DOC 9905)

Amend paragraph 4.6.2 as follows:

The considerations of missed approach design options follow this order:

- a) Standard missed approach using an RNP navigation accuracy requirement of 1.0 NM
- b) ~~RNAV missed approach using RNP APCH.~~ An RNP navigation accuracy requirement less than 1NM is used only when a significant operational advantage is achieved, and
- c) Use of an RNP navigation accuracy requirement less than 1NM requires the use of approved inertial sensor input as described in Par 4.6.5 and illustrated in Figures 4-22b and 4-22c

ACTUALIZACIÓN DEL MANUAL RNP AR (DOC 9905)

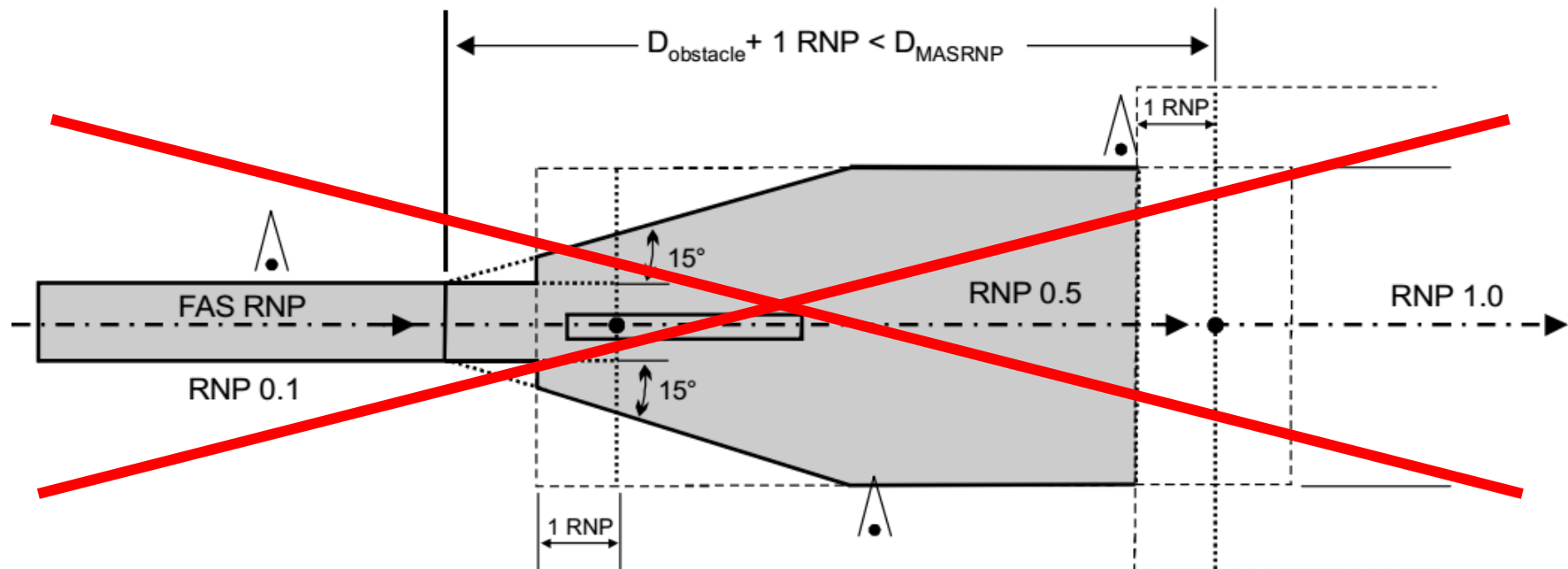
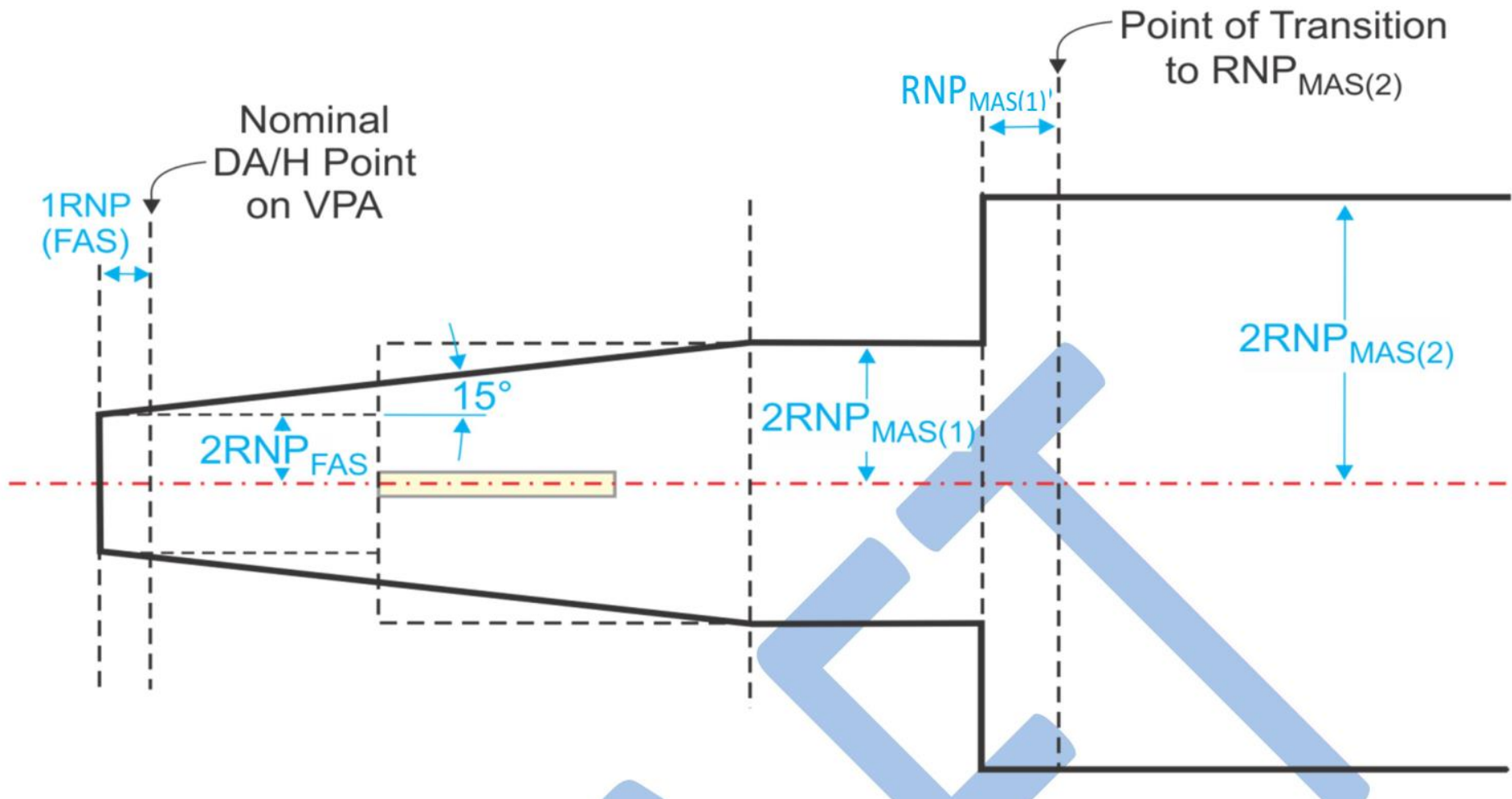


Figure 4-22. Maximum extension of RNP < 1.0 in the missed approach

ACTUALIZACIÓN DEL MANUAL RNP AR (DOC 9905)

Area Construction: Missed Approach RNP < 1



ACTUALIZACIÓN DEL MANUAL RNP AR (DOC 9905)

$$D_{MAS} = (RNP_{MAS} - 0.05) \cdot \frac{(TAS - 10)}{Drift_{IRU}}$$

Where

TAS = **initial missed** approach IAS in kt converted to TAS based on LTP/FTP elevation and ISA +15

D_{MAS} = Maximum distance of RNP less than 1 in the missed approach

$Drift_{IRU}$ = Maximum drift of the Inertial Reference Unit (Nominally 8 NM/hour, if better IRU drift rates can be demonstrated, this value can be reduced accordingly, and must be promulgated in the PBN Requirements Box on the approach chart).

ACTUALIZACIÓN DEL MANUAL RNP AR (DOC 9905)

Fines 2018!

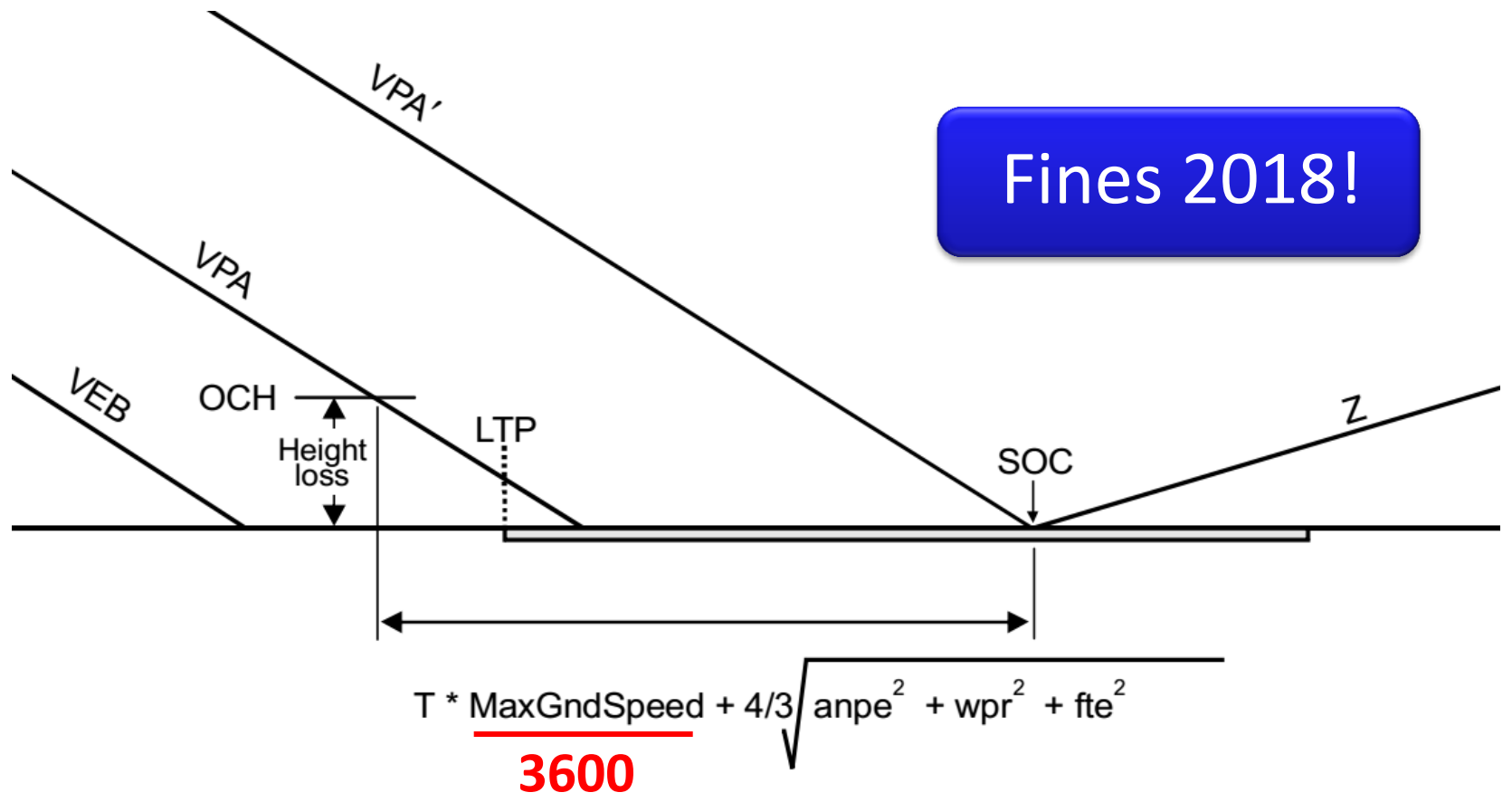
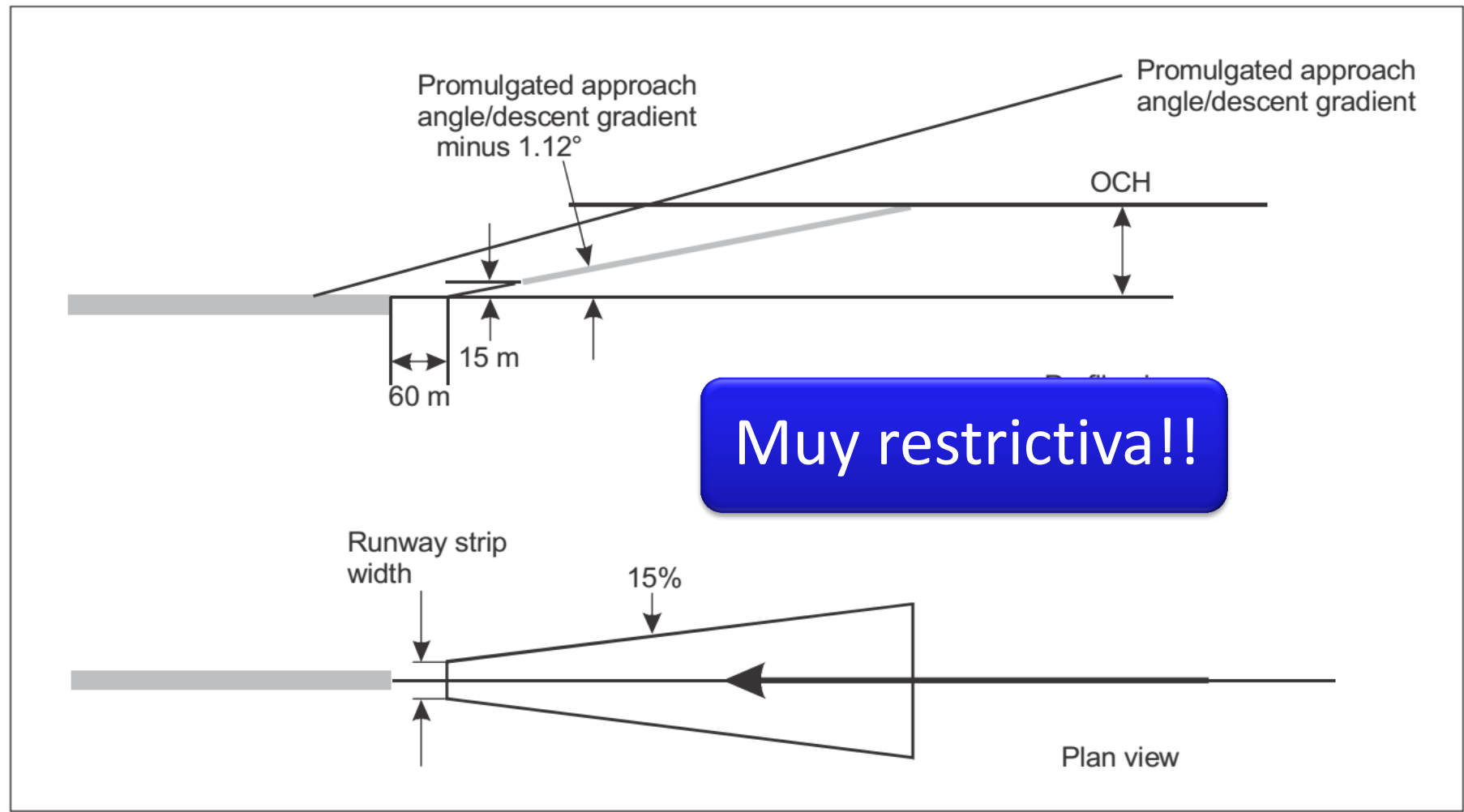


Figure 4-25. Missed approach surface (Z)

TEMAS DESARROLLADOS POR EL IFPP

- Salidas RNP AR
- Actualización del Manual RNP AR (DOC 9905)
- VSS – Clarificación y Aplicación
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VSS – CLARIFICACIÓN Y APLICACIÓN

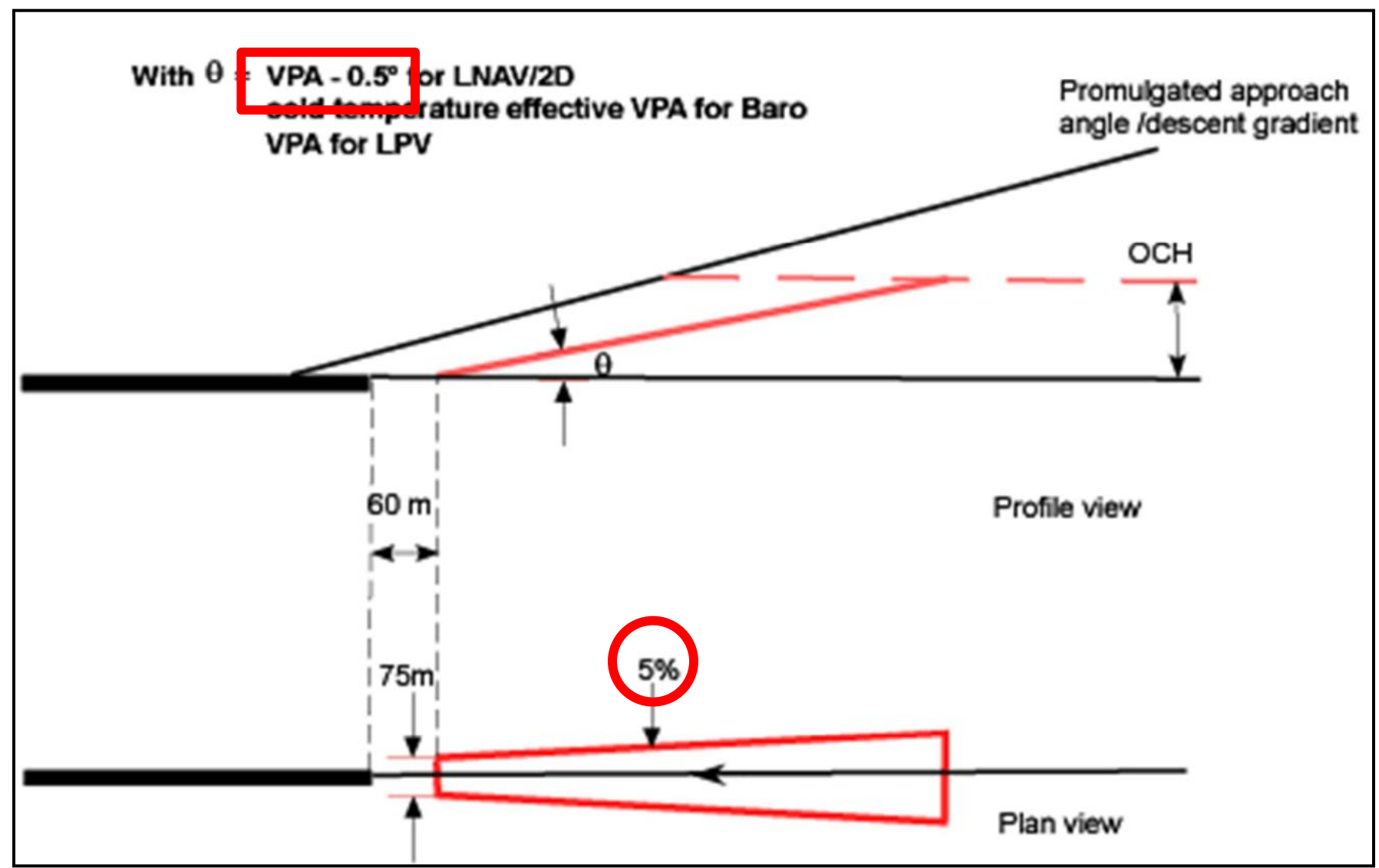


VSS – CLARIFICACIÓN Y APLICACIÓN

➔ Dos líneas de estudio:

- Reducir el área de la VSS >> sistema que proporciona guía de navegación
- Mantener su anchura, pero definir una parte donde penetraciones son aceptables >> publicar el obstáculo

VSS – CLARIFICACIÓN Y APLICACIÓN



VSS – CLARIFICACIÓN Y APLICACIÓN

5.4.6.4 Si se penetra en la VSS, el procedimiento de aproximación no debería promulgarse sin un estudio aeronáutico. Las medidas de mitigación como resultado de ese estudio podrían resultar en un aumento de la pendiente/ángulo de descenso y/o en el desplazamiento del umbral de la pista. Los obstáculos de una altura inferior a 15 m por encima del umbral podrían no tenerse en cuenta cuando se evalúa la VSS. Los obstáculos móviles temporarios, tales como aeronaves en espera en el punto de espera de la pista están permitidos.

5.4.6.4 If the VSS is penetrated, the approach procedure ~~should~~ shall not be promulgated without an aeronautical study. Mitigation action as a result of such a study may result in the removal or lowering of the obstacle, an increase of the descent gradient/angle and/or runway threshold displacement. Obstacles with a height less than 15 m above the threshold may be disregarded when assessing the VSS. Temporary moving obstacles such as aircraft holding at the runway hold-point are allowed.

5.4.6.5 Any penetration of the VSS shall be identified on the instrument approach chart.

Cómo publicar los
obstáculos?

VSS – CLARIFICACIÓN Y APLICACIÓN

→ Reunión IFPP (Marzo 2016):

5.2 JOB CARD IFPP00X – VISUAL SEGMENT SURFACE (VSS): USE AND PROMULGATION

WP1b-016, WP 2-021

A safety improvement was proposed that included an area of the VSS where no infringement would be allowed. The meeting agreed to the proposal.

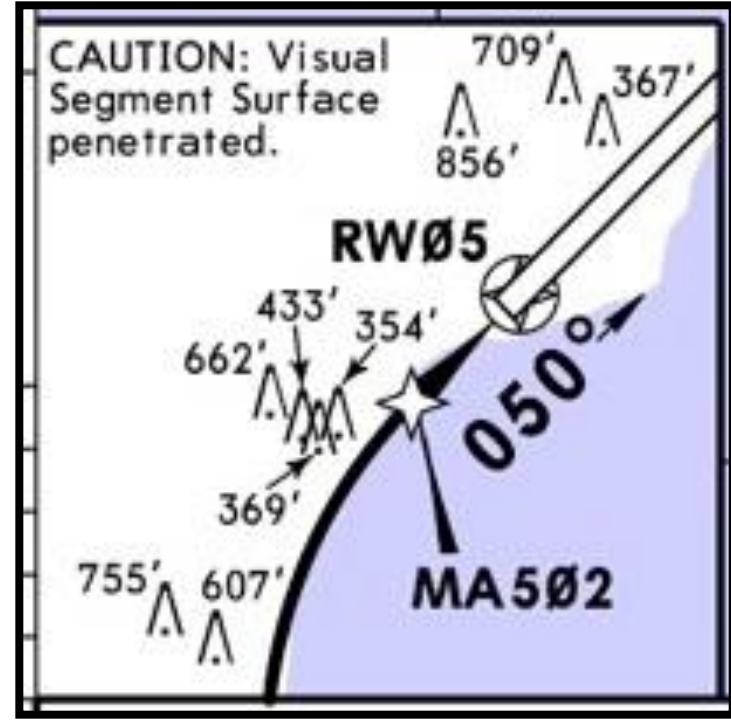
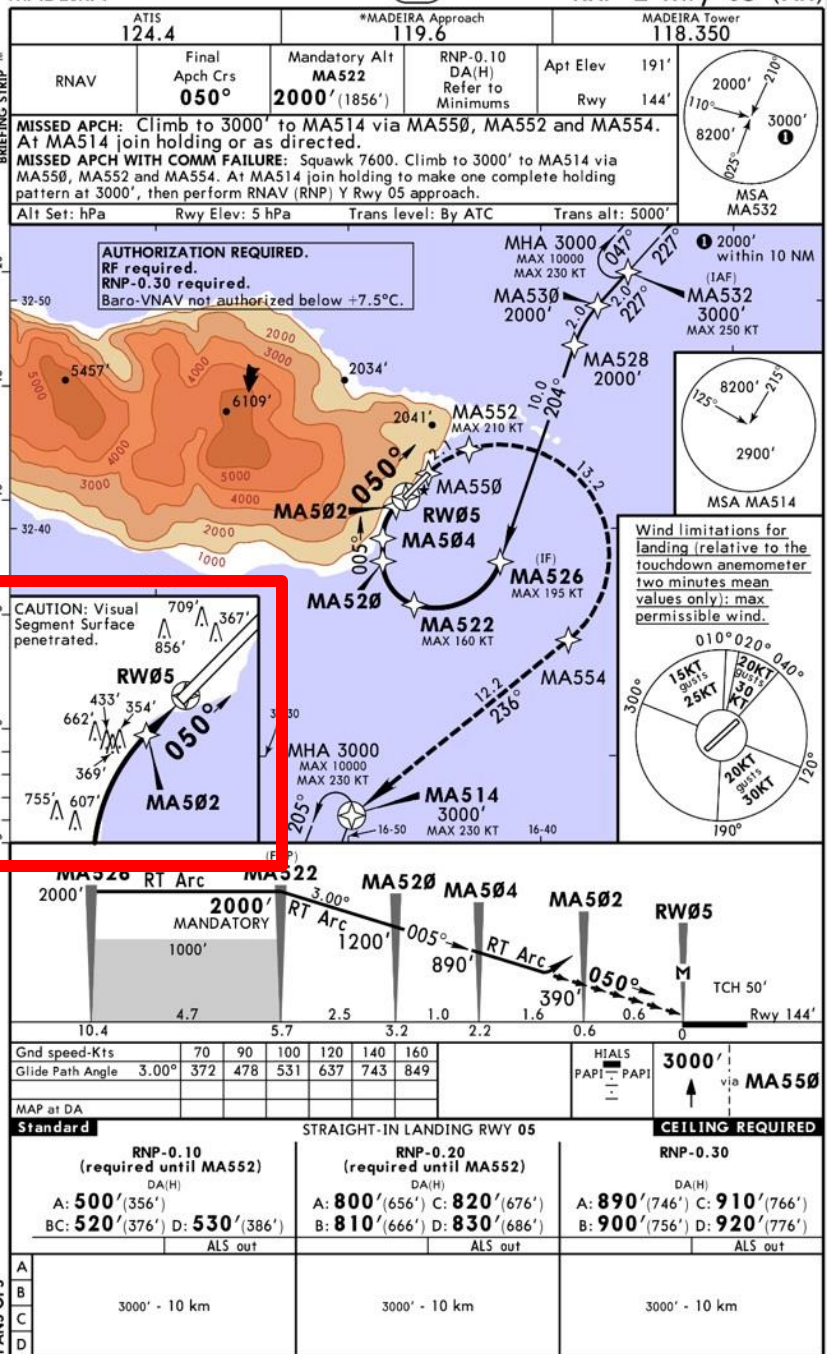
WG 2 is working on charting examples for VSS presentation and these should be available by September 2016.

Action IFPP WG 13-3/ 31

WG 1b to submit a paper to IFPP 13 through the Secretariat by September 5th 2016

Action IFPP WG 13-3/ 33

WG2 to provide charting examples on VSS to the Secretariat by September 5th 2016.

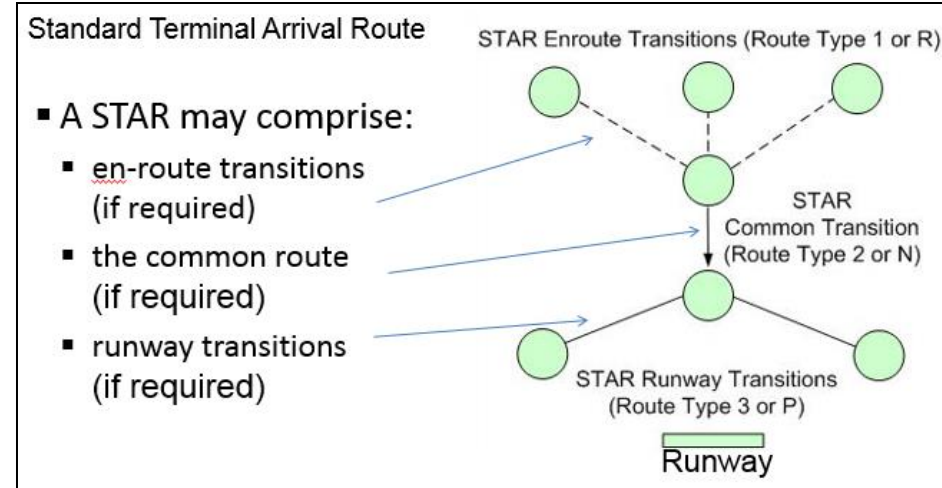
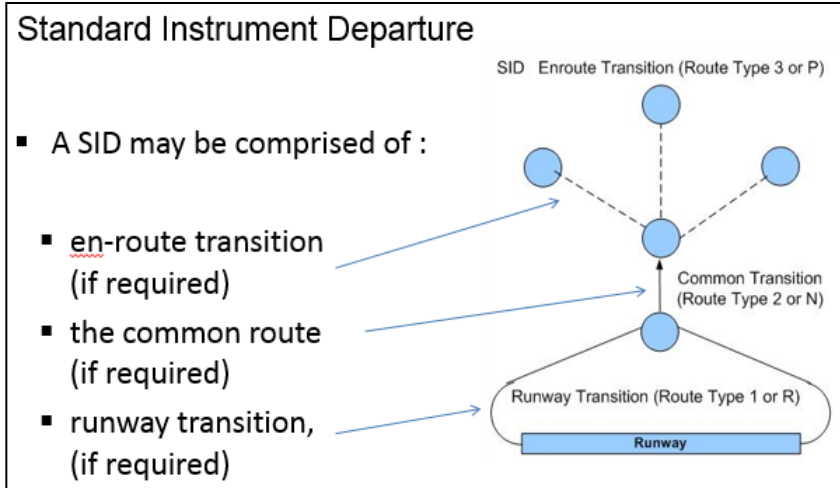


TEMAS DESARROLLADOS POR EL IFPP

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CONCEPTO DE TRANSICIÓN (SID/STAR)

➔ Discusión se basa en la manera en que los procedimientos son codificados y cargados >> ARINC 424



CARTA DE SAÍDA PADRÃO
POR INSTRUMENTOS (SID)

STANDARD DEPARTURE CHART
INSTRUMENT (SID)

JOINVILLE / LAURO CARNEIRO DE LOYOLA (SBJV)
RWY 33

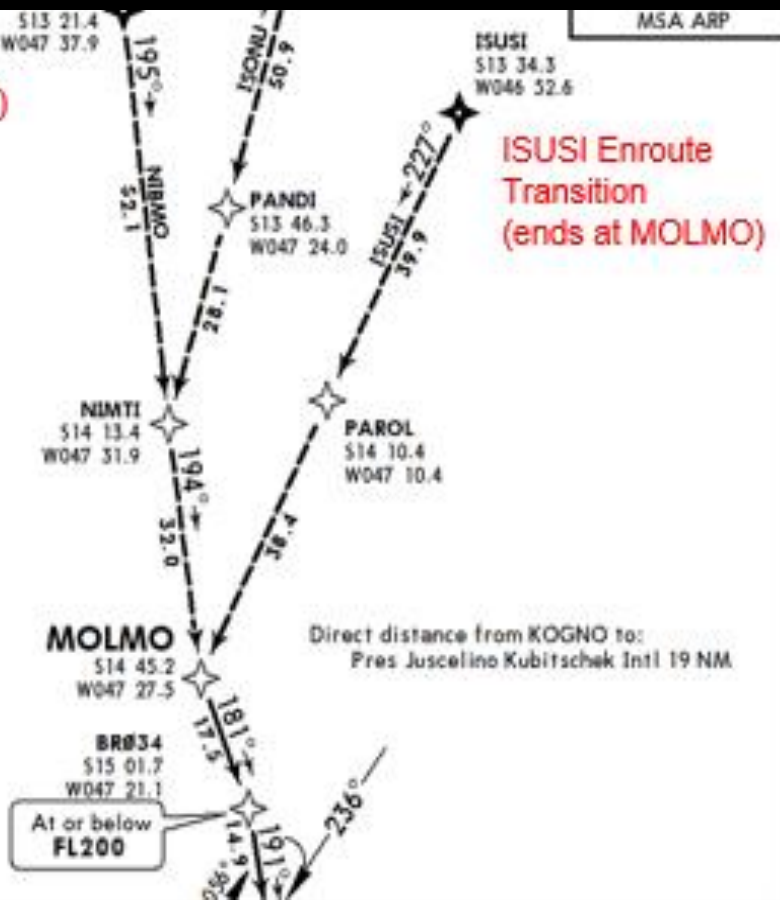
RNAV AGURI 1 - CTB 1 - LJS 1
NAFIL 1 - PNG 1 - VUKUS 1

TA 4000'	TWR JOINVILLE 118.00	APP CURITIBA 119.95 129.55 121.50	APP NAVEGANTES 119.50	ACC CURITIBA 124.40 124.70 125.40 126.10 127.50 121.50
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NIMBO Enroute
Transition
(ends at MOLMO)

ISUSI Enroute
Transition
(ends at MOLMO)

¿Identificación
Anexo 11?



CONCEPTO DE TRANSICIÓN (SID/STAR)

- ➔ Brasil utiliza ese concepto (Proyecto PBN RJ/SP 2012)
 - Controladores de tránsito aéreo y pilotos
 - Proceso de diseño de procedimientos (FPDAM, menos cartas)
 - No hay cambios en los criterios de diseño

- ➔ Hay impactos y necesidades...
 - Identificación de las SID/STAR >> costos!!
 - Normas ICAO >> Anexo 11
 - Fraseología ATC
 - Definición de criterios para armonización
 - Entrenamiento de los Diseñadores de Procedimientos

CONCEPTO DE TRANSICIÓN (SID/STAR)

→ Reunión IFPP (Marzo 2016):

5.10 JOB CARD IFPP00X – TRANSITIONS CONCEPT

No papers presented. Several members who already had experience with transitions **were very positive** about the transition concept. The advantage of the application of transition is that less data would be required for input in the database. It also make it easier for pilots to recognize the arrival. A warning was expressed on other ICAO documentation and we need to consider those documents and its impact. The rapporteur was requested to prepare a jobcard and report back later in the meeting. However due to early departure the rapporteur was not in position the report back and is expected to this at a later stage.

Action IFPP WG 13-3/ 42

WG3 rapporteur to provide job card on transition concept by IFPP 13.

CONCEPTO DE TRANSICIÓN (SID/STAR)

→ Reunión del Subgrupo ATM (JUL 2016):

Transition concept:

The concept was presented and extensively discussed. Some team-members felt that it could be impossible to implement the concept due to phraseology problems. The necessity of implementation was also discussed and during the next meeting, a decision has to be made if the concept should be implemented or not. It was also mentioned that the operator perspective would be important to know as a basis for further discussion.

The decision was made to approach several airlines and also ATC for feedback. The results will be presented at the next ATM WG meeting.



TEMAS DESARROLLADOS POR EL IFPP

- Salidas RNP AR
- Actualización del Manual RNP AR (DOC 9905)
- VSS – Clarificación y Aplicación
- Concepto de Transición (SID/STAR)

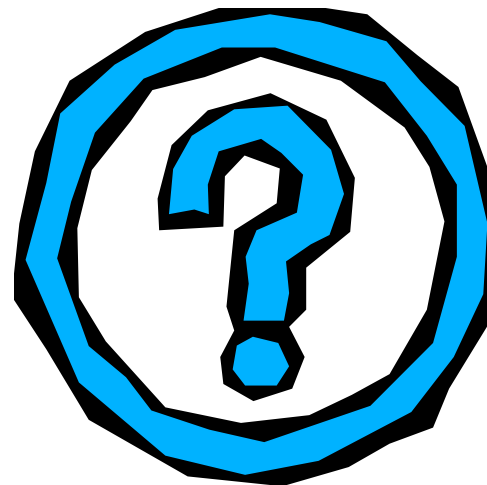
OBJETIVO

- ➔ Conocer el Panel de Procedimientos de Vuelo por Instrumentos (IFPP) de la OACI.

TEMARIO

- ➔ ¿Qué es IFPP?
- ➔ ¿Cómo funciona el IFPP?
- ➔ ¿Cuáles son los temas desarrollados por el IFPP?

INFORMACIÓN DEL MIEMBRO DEL IFPP



FERNANDES JÚNIOR – EXPERTO PANS-OPS

e-mail: juniorcta@gmail.com

fernandescfj@cindacta2.gov.br

Tel: (41) 3251-5239