PBN Procedure Design Course 2026

ICAO APAC FPP

Beijing,China

(7-25/Sep/2026)

Baro-VNAV

New Approach Classification

Domain	Document	Aspect				
Approach Operations	Annex 6	Classification	Type A (>= 250')		Type B CAT I (>= 200')	Type B CAT II (>= 100') / CAT III (<100')
		Method	2D	3D		
		Minima	MDA/H	DA/H*		
Approach Runways	Annex 14	M(DA/H) >= VMC	Non Instrument RWY			
		M(DA/H) >= 250' Visibility=1 000m	Non Precision Approach RWY			
		DA/H >= 200' Visibility>=800m or RVR >= 550m	Precision Approach RWY, Category I			
		DA/H >= 100' RVR >= 300m	Precision Approach RWY, Category II			
		DA/H >= 0' RVR >= 0m	Precision Approach RWY, Category III (A, B & C)			
System Performance Procedures	Annex 10 PANS-OPS Vol. II	NPA	NDB, Lctr, LOC, VOR, Azimuth, GNSS			
		APV		GNSS/Baro/SBAS		
		PA		ILS, MLS, SBAS, GBAS		

BARO-VNAV CRITERIA

It is an APV (Approach Procedure with Vertical Guidance) to support Type A 3D approach operations :

- FAP instead of FAF
- DA/H not an MDA/H
- No MAPt
- Use THR coordinates system

Note : FAF and MAPt are needed for other purposes

BARO-VNAV CRITERIA

- Baro-VNAV procedures are used in association with LNAV only procedures. The LNAV FAF and MAPt are needed to define the lateral areas and to support the lateral guidance but they are not used for the vertical navigation function. They are used to define the geometry of the areas and surfaces and for database coding purposes

BARO-VNAV vertical guidance

- The vertical guidance is defined with :
  a) a lateral axis
  b) a vertical path angle
  c) an anchor point

  Depending on avionic system this point could be
  - MAPT

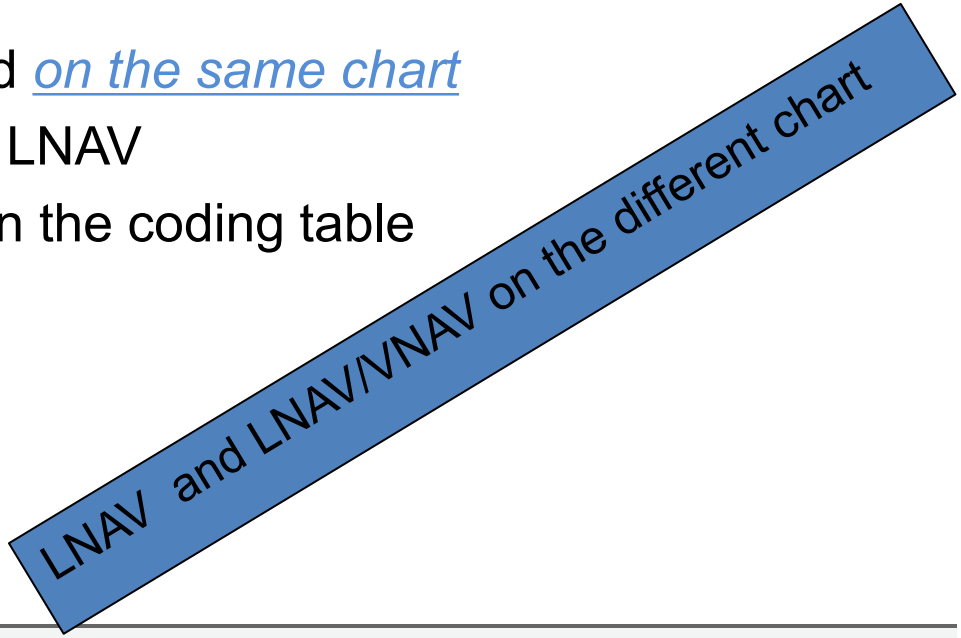
  d) the height on the vertical path at this anchor point

BARO-VNAV vertical guidance

- At MAPt : Lateral guidance switches to Missed Approach RNP 1
- No vertical guidance after the anchor point
- After MAPt:
  - No vertical guidance
- To provide efficient information in the coding table
  - Publish MAPt with height on vertical path at MAPt

MAPt

- Even if there is no MAPt as latest point to initiate the missed approach
- There is a « MAPT » :
  - For avionic system
  - For coding purpose
- If a LNAV procedure is published *on the same chart*
  - « MAPT » is the same as in LNAV
- If not: a MAPt is still published in the coding table



APV BARO-VNAV KEY FEATURES

- Includes cold temperature correction
- Has a minimum promulgated temperature
- Can have a maximum promulgated temperature
- Cannot be used with remote altimeter setting
- Area defined by underlying LNAV area
- Identified in the minimum box by
  - "LNAV/VNAV"

APV SEGMENT

PART III SECTION 3 CHAPTER 4.3

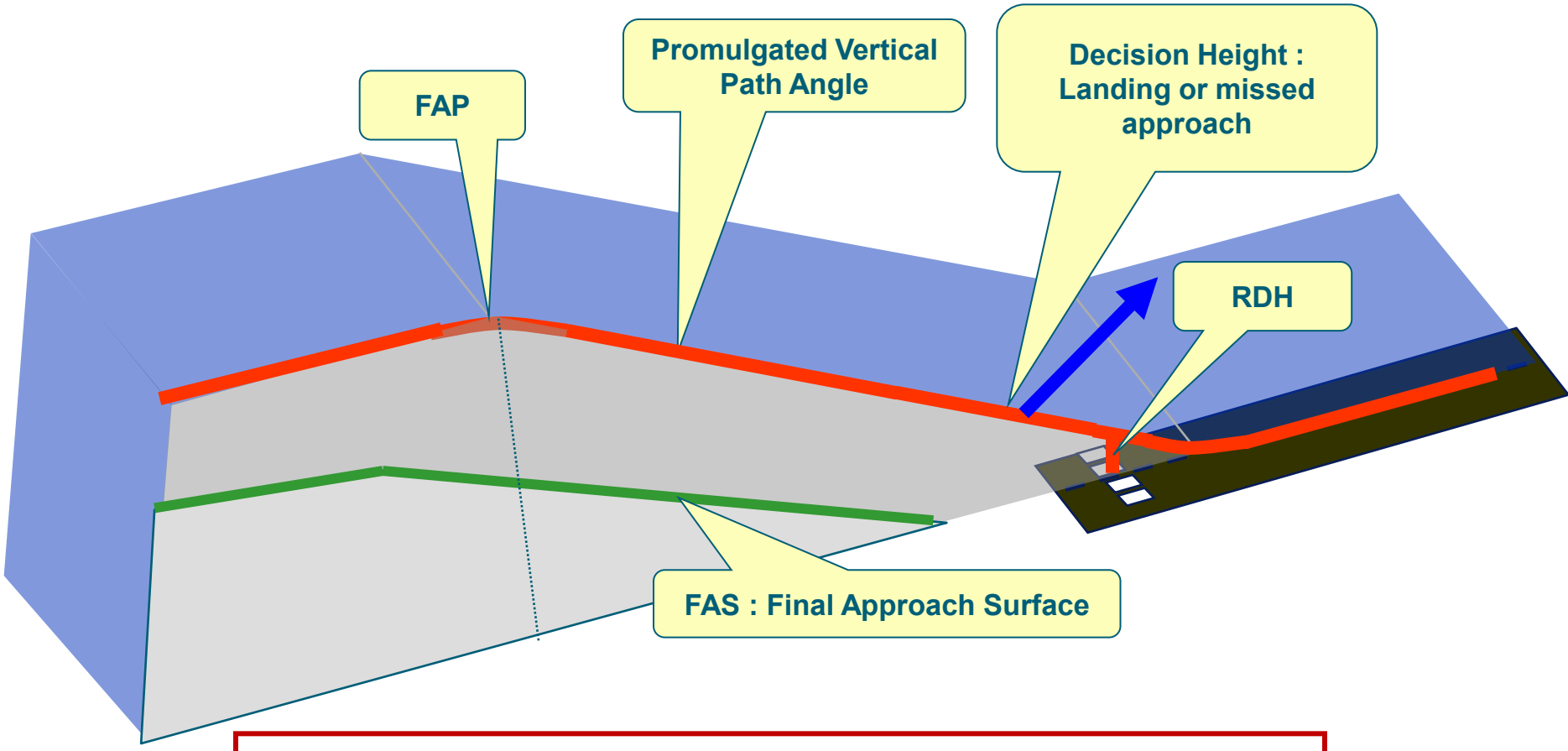
APV SEGMENT

- The APV segment for the Baro-VNAV approach contains the final descent segment for landing and the initial and intermediate segments of the missed approach. It should be aligned with the extended runway centre line
- APV Obstacles Assessment Surfaces (OAS) have to be defined to assess obstacles
- Specific criteria are used to assess obstacles located inside APV OAS
- The LNAV missed approach criteria apply after the end of the APV OAS.

APV OAS SEGMENT

- Starts at FAP (intersection—intermediate altitude and VPA)
- Ends at MATF, MAHF or the turn altitude
- FAP should not be located more than 10 Nm before THR
- VPA ∈ [2,5° , 3.5°]
- RDH should be 15 m
- Final axis = RWY axis (max turn at FAF 15°)
- 3 surfaces and associated side surface
  - Final Approach Surface (FAS)
  - Ground Plane/Horizontal Plane
  - Missed approach surface (Z)
- Each surface split in：
  - Central surface bounded laterally by the LNAV primary area
  - Side surfaces bounded laterally by the LNAV secondary area

FINAL APPROACH SURFACE : FAS



FAS depends on : Hi, VPA, Temperature correction

PARAMETERS NECESSARY TO DEFINE : FAS

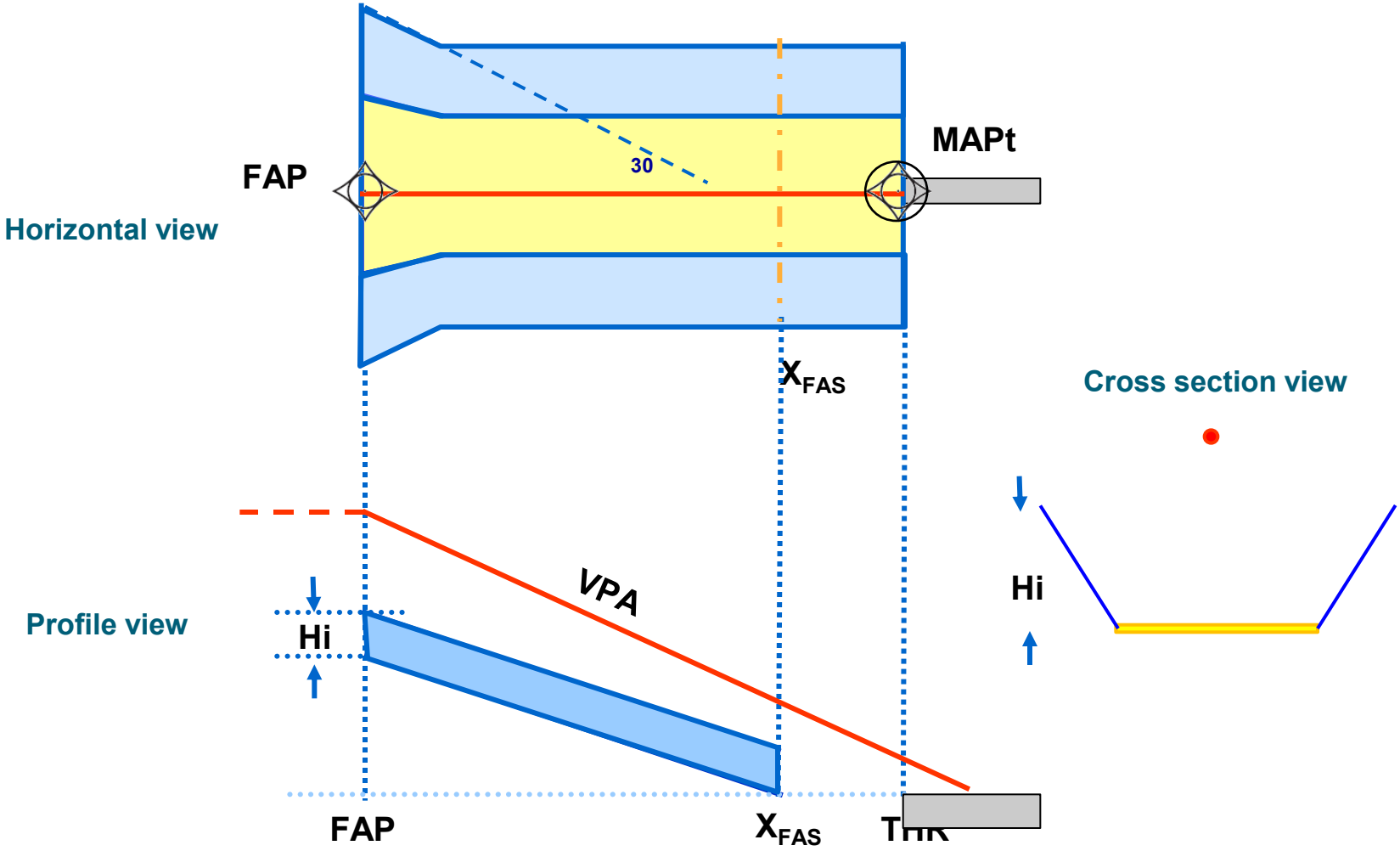
- Lateral : LNAV surface
  - MAPt at threshold
  - FAF at FAP
  - The secondary area of LNAV surfaces become OAS side surfaces

RNP APCH	½ AW
FAF	1.45
MAPt	0.95
MATP	2

- Vertical :
  - VPA
  - Temperature correction : Δh
  - Hi
  - ATT = 0.8 x RNP(NM)= 444 m

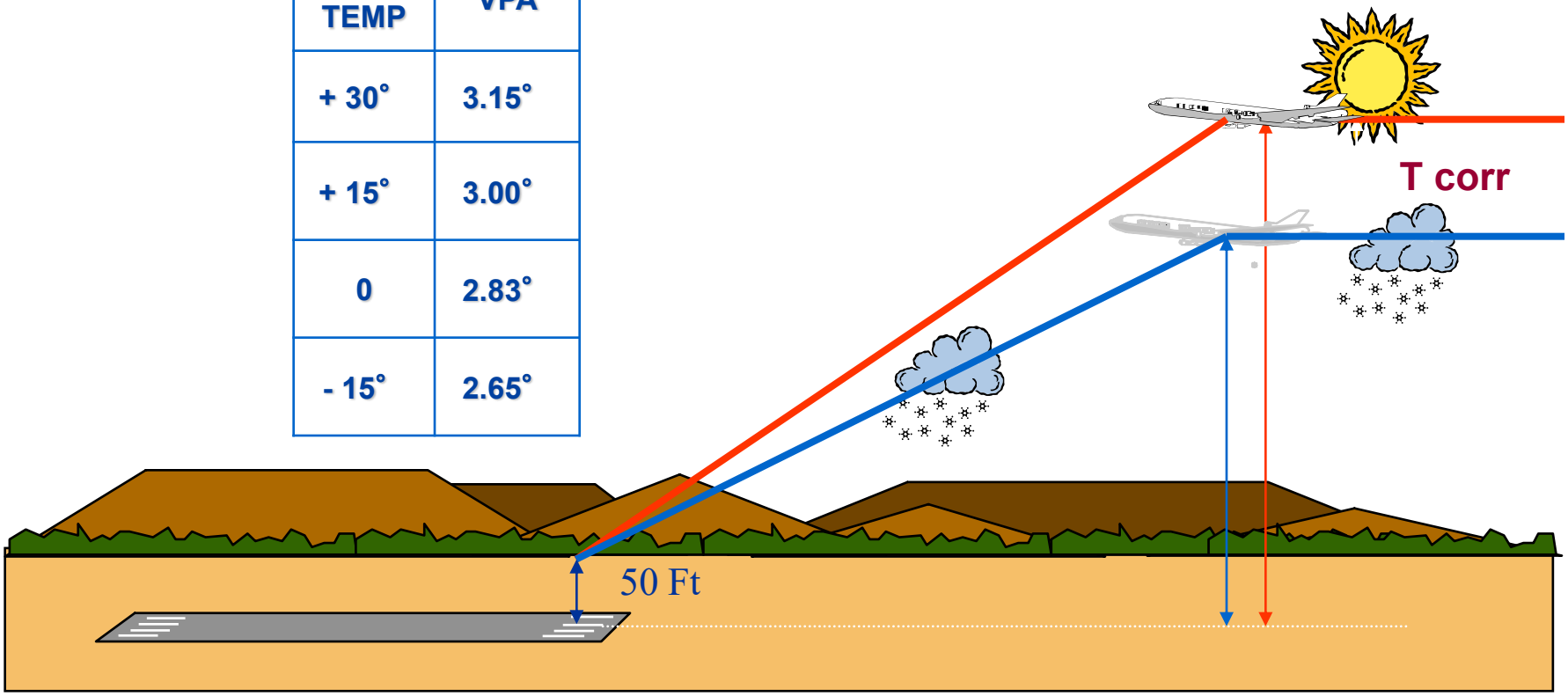
XFAS : Origin of surface at the threshold level
αFAS : Angle of the FAS

DESIGN CRITERIA : FAS AND SIDE SURFACES



TEMPERATURE IMPACT ON VPA

A/D TEMP	VPA
+ 30°	3.15°
+ 15°	3.00°
0	2.83°
- 15°	2.65°



TEMPERATURE IMPACT ON VPA

When temperature is far from the standard ISA value, the Baro-VNAV vertical path will be different from the nominal one with no difference on display view given to the pilot

A vertical slope based on altimetric information will be lower in cold temperature

A vertical slope based on altimetric information will be higher in hot temperature

DETERMINATION OF PROMULGATED TEMPERATURE

Table III-3-4-1. Effective vs promulgated VPA as a function of aerodrome elevation and temperature (Green = optimum; Yellow = non-standard; Orange = prohibited)

	Promulgated VPA 2.8°			*Promulgated VPA 3.0°*			*Promulgated VPA 3.2°*		
Temp (C°)	*Aerodrome elevation*			*Aerodrome elevation*			*Aerodrome elevation*		
	MSL	*3 000 ft*	*6 000 ft*	*MSL*	*3 000 ft*	*6 000 ft*	*MSL*	*3 000 ft*	*6 000 ft*
50	3.14	3.21	3.28	3.37	3.44	3.51	3.59	3.67	3.75
40	3.05	3.11	3.18	3.26	3.33	3.40	3.48	3.55	3.63
30	2.95	3.01	3.07	3.16	3.22	3.29	3.37	3.44	3.51
20	2.85	2.91	2.97	3.05	3.12	3.18	3.26	3.32	3.40
10	2.75	2.81	2.87	2.95	3.01	3.07	3.14	3.21	3.28
0	2.65	2.71	2.77	2.84	2.90	2.96	3.03	3.10	3.16
-10	2.55	2.61	2.66	2.74	2.79	2.85	2.92	2.98	3.04
-20	2.46	2.51	2.56	2.63	2.69	2.74	2.81	2.87	2.93
-30	2.36	2.41	2.46	2.53	2.58	2.63	2.70	2.75	2.81
-40	2.26	2.31	2.36	2.42	2.47	2.53	2.58	2.64	2.70
-50	2.16	2.21	2.26	2.32	2.36	2.42	2.47	2.52	2.58

CALCULATION OF TEMPERATURE CORRECTION

- $\Delta h = -\left(\frac{\Delta T_{STD}}{Lo}\right) \times \ln\left[1 + \frac{Lo \times h_{FAP}}{To + Lo \times h_{THR}}\right]$

ΔT_{STD}	=	temperature deviation from the standard day (ISA) temperature
L_o	=	standard temperature lapse rate with pressure altitude in the first layer (sea level to tropopause) of the ISA (-0.0065°/m)
h_{FAP}	=	procedure height above the threshold at the FAP
T_o	=	standard temperature at sea level (288.15K)
h_{THR}	=	threshold elevation above mean sea level

Ex: h_{FAP}= 900m, h_{THR}=300m, Tmin = -20° C

ΔT_{STD} = (273,15 – 20) – (-0,0065 × 300) -288,15 = -33,05

$\Delta h = -\left(\frac{-33,05}{-0,0065}\right) \times \ln\left[1 + \frac{-0,0065 \times 900}{288,15 - 0,0065 \times 300}\right]$ = 105,01m

TABULATED TEMPERATURE CORRECTION

- Tables
  - function of Height of FAP above THR and A/D temperature

	Height of FAP above threshold at sea level (m)								
Aerodrome temperature (°C)	300	450	600	750	900	1 050	1 200	1 350	1 500
50	-37	-55	-73	-92	-110	-129	-148	-167	-185
40	-26	-39	-52	-66	-79	-92	-106	-119	-132
30	16	24	31	39	47	55	63	71	79
20	-5	-8	-10	-13	-16	-18	-21	-24	-26
10	5	8	10	13	16	18	21	24	26
0	16	24	31	39	47	55	63	71	79
-10	26	39	52	66	79	92	106	119	132
-20	37	55	73	92	110	129	148	167	185
-30	47	71	94	118	142	166	190	214	238
-40	57	86	115	144	171	203	232	262	291
-50	68	102	136	171	205	240	274	309	344

	Height of FAP above threshold at 900 m AMSL (m)								
Aerodrome temperature (°C)	300	450	600	750	900	1 050	1 200	1 350	1 500
50	-44	-65	-87	-109	-132	-154	-176	-198	-221
40	-33	-49	-66	-83	-99	-116	-133	-150	-167
30	-22	-33	-45	-56	-67	-79	-90	-101	-113
20	-12	-17	-23	-29	-35	-41	-47	-53	-59
10	1	1	2	2	3	3	4	4	5
0	10	15	20	25	29	34	39	44	49
-10	20	31	41	51	62	72	83	93	104
-20	31	47	62	78	94	110	126	142	158
-30	42	63	84	105	126	147	169	190	212
-40	52	79	105	132	158	185	212	239	266
50	63	95	127	159	191	223	255	287	320

Ex : (for THR at 300m, use THR at Mean sea level)

TEMPERATURE CORRECTION Δh

- Formula :

Appendix A to Chapter 4

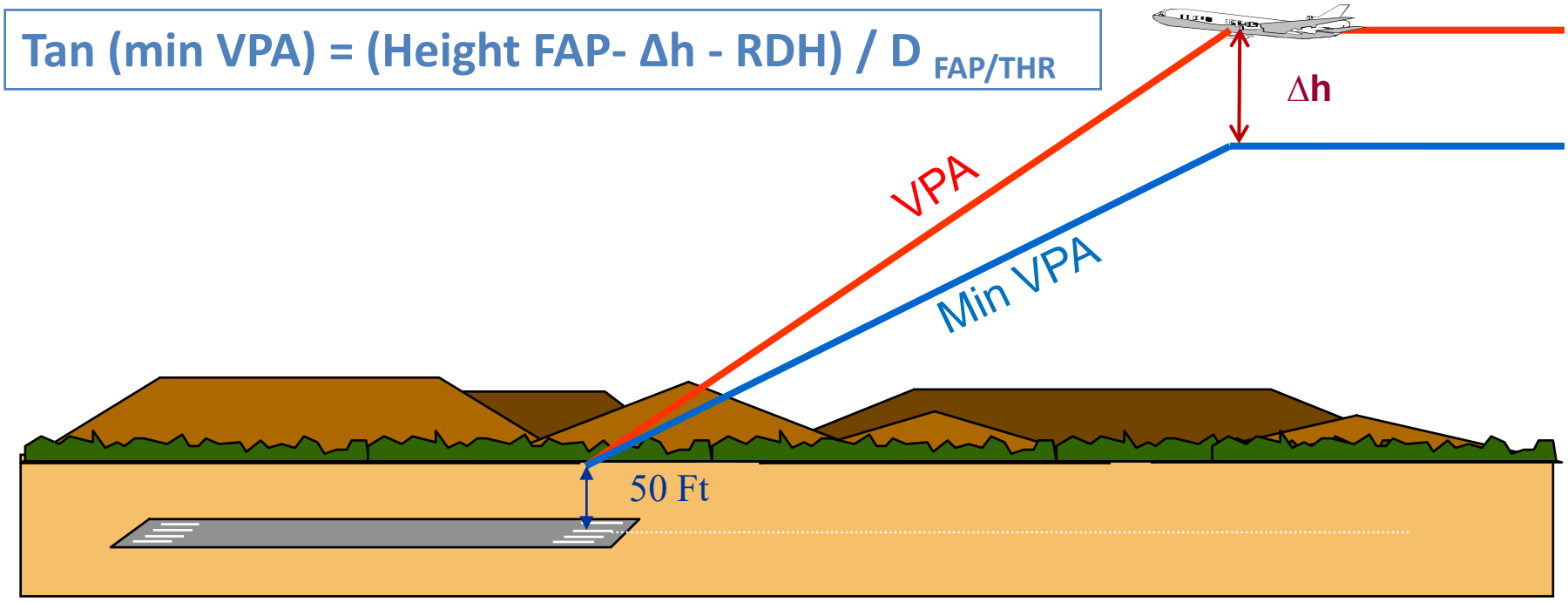
- Table :

Table III-3-4 App A-1 to III-3-4 App A-6

Δh is positive when the atmosphere is colder than the standard one
Δh is negative when the atmosphere is warmer than the standard one

MIN VPA CHECK

Tan (min VPA) = (Height FAP- Δh - RDH) / D $_{FAP/THR}$



MIN VPA CHECK

- Calculation of Min VPA

  TAN MIN VPA= (Height FAP- Δh - RDH) / Dist(FAP-THR)

- If less than 2.5 degrees:
  - Increase VPA (Max value 3.5 degrees)
  - Increase minimum promulgated temperature

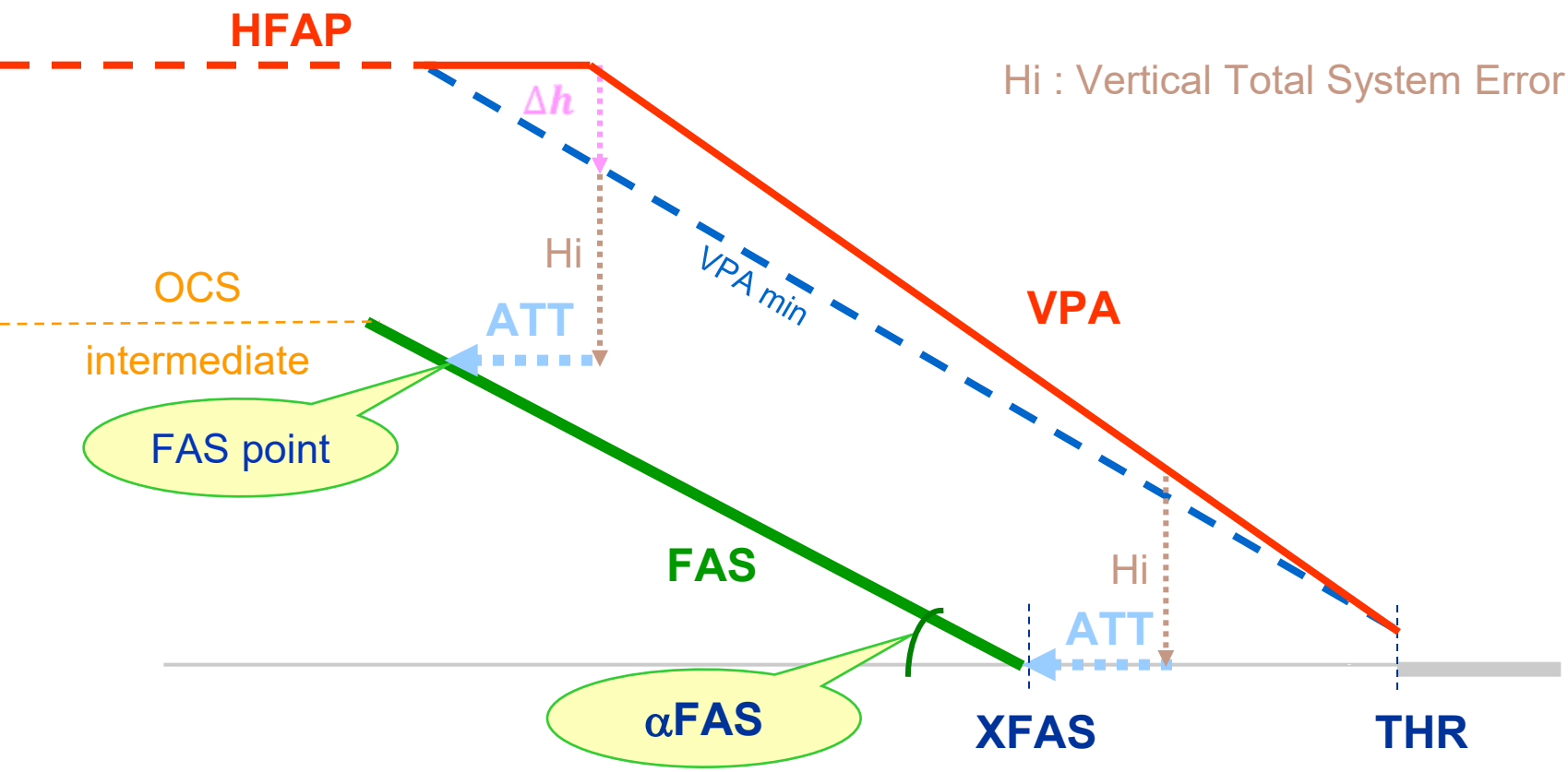
MAX VPA CHECK

- Define maximal temperature
- Compute ∆h (negative value)
- Compute max VPA

Tan (max VPA) = (Height FAP- Δh - RDH) / D $_{FAP/THR}$

- If max VPA is higher than 3.5° , the temperature above which the effective VPA will exceed 3.5° shall be promulgated

FINAL APPROACH SURFACE (FAS)



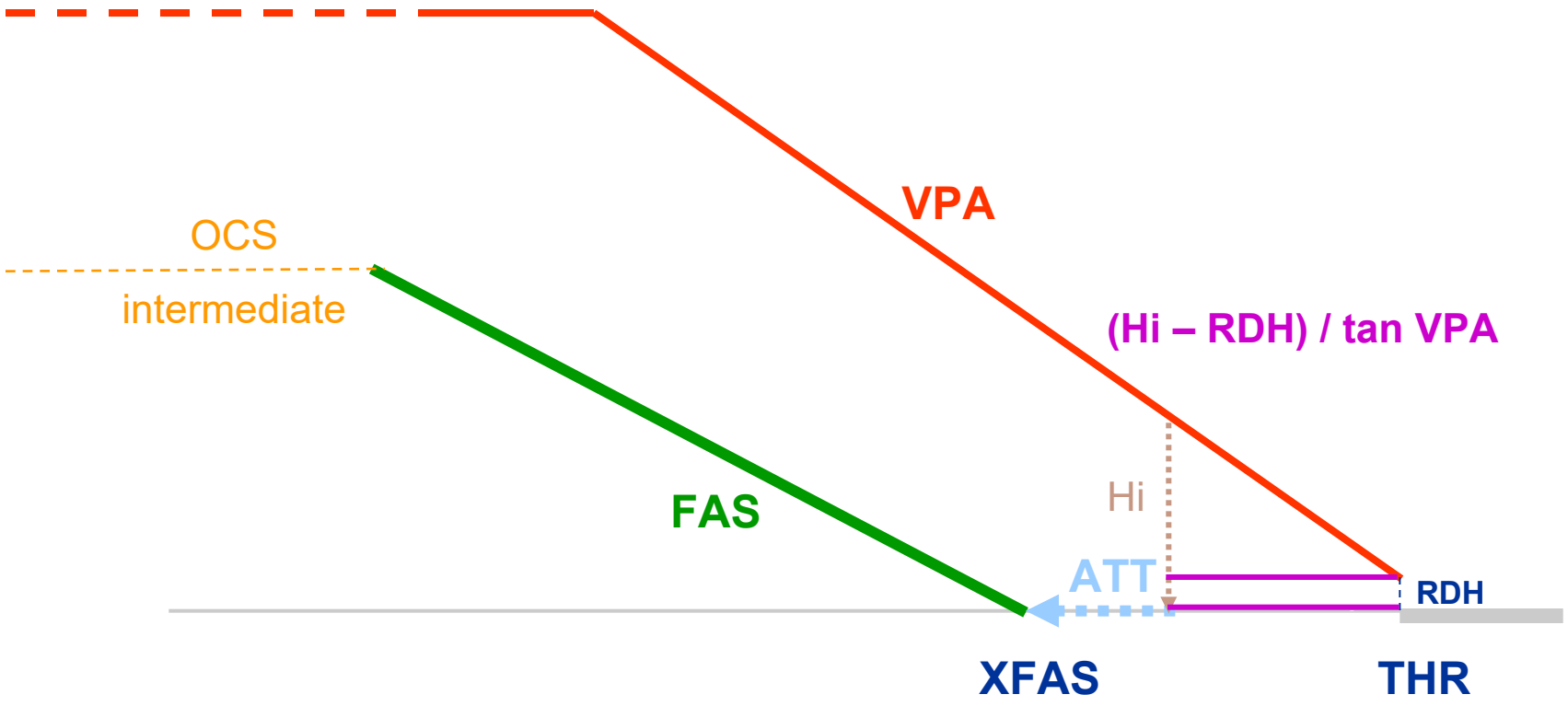
Hi : Vertical Total System Error

FAS CALCULATION

- Calculate origin : XFAS
- Calculate gradient : αFAS
- FAS equation :

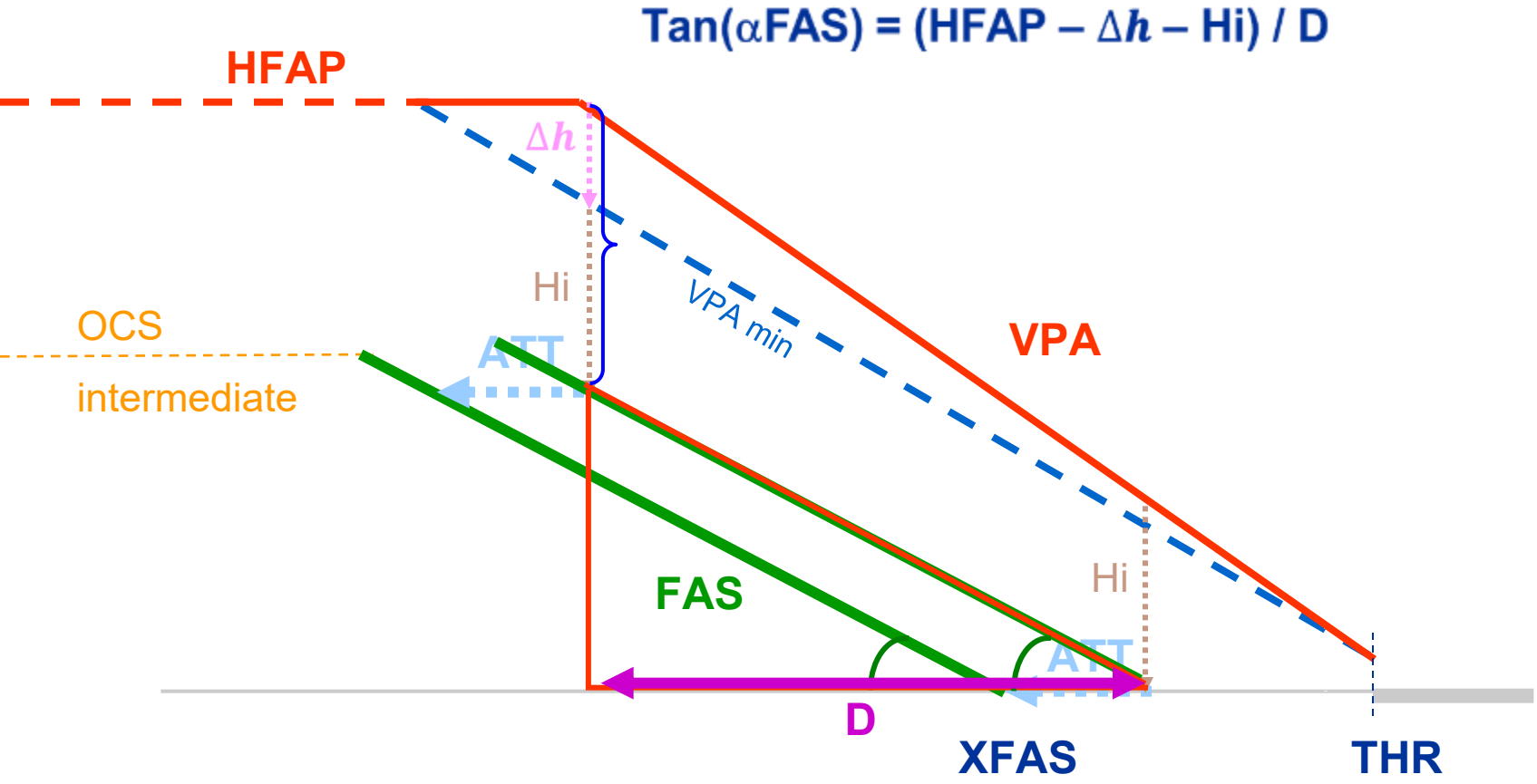
$$h(FAS) = (x\text{-}XFAS).\tan(\alpha FAS)$$

CALCULATE ORIGIN : XFAS

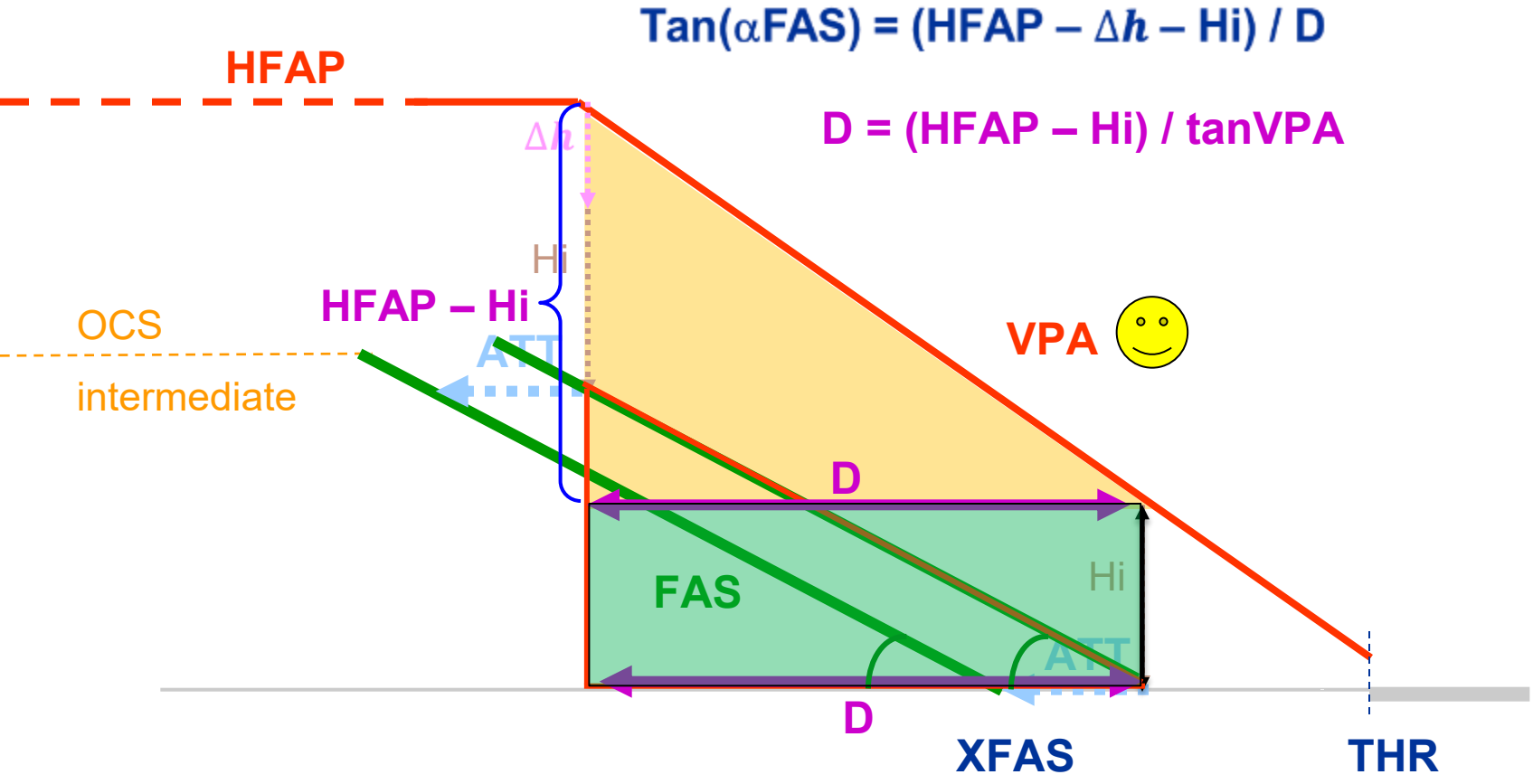


XFAS = [(Hi – RDH) / tan VPA] + ATT

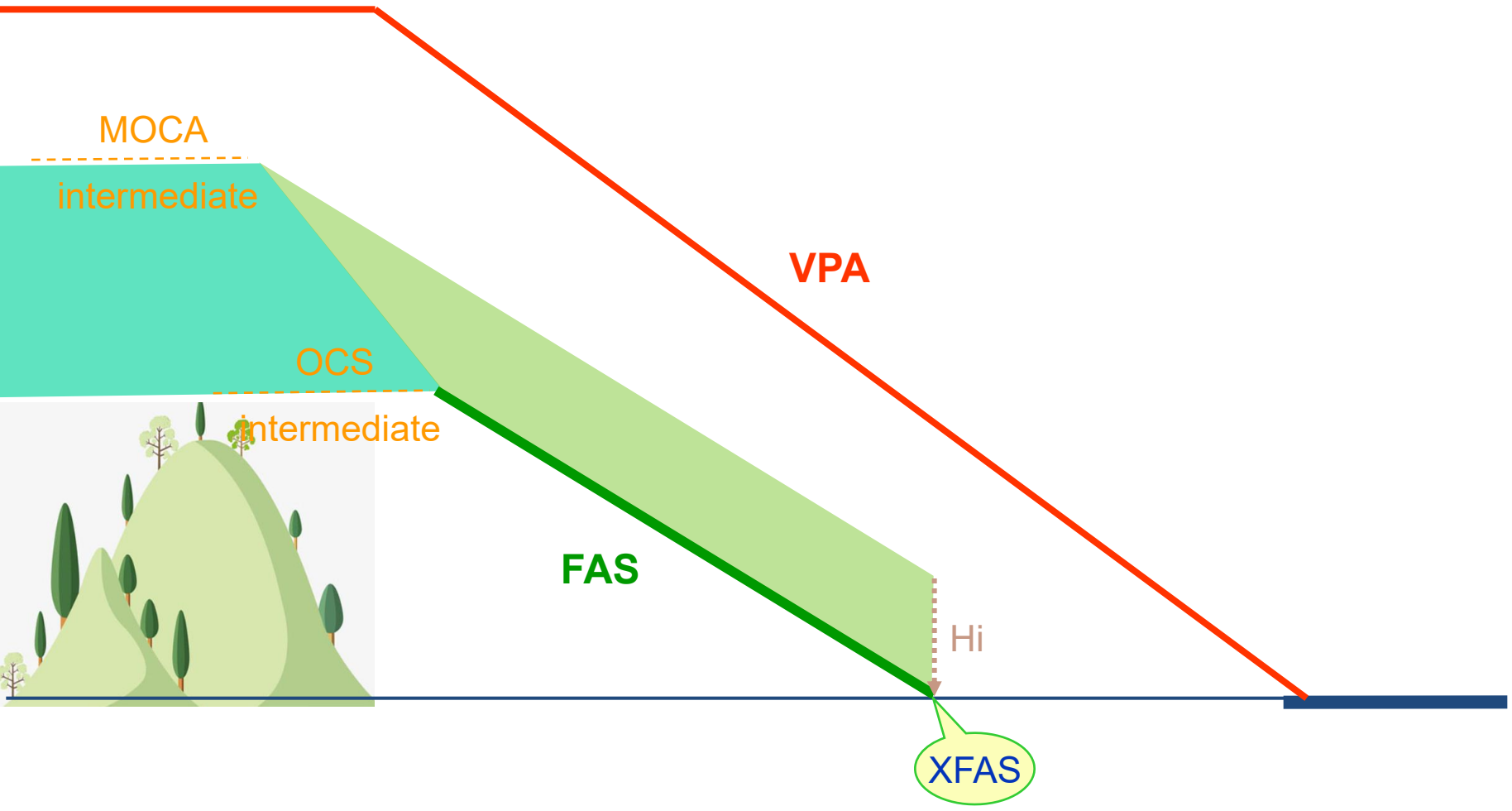
CALCULATE GRADIENT : αFAS



CALCULATE GRADIENT : αFAS



FAS SIDE SURFACE

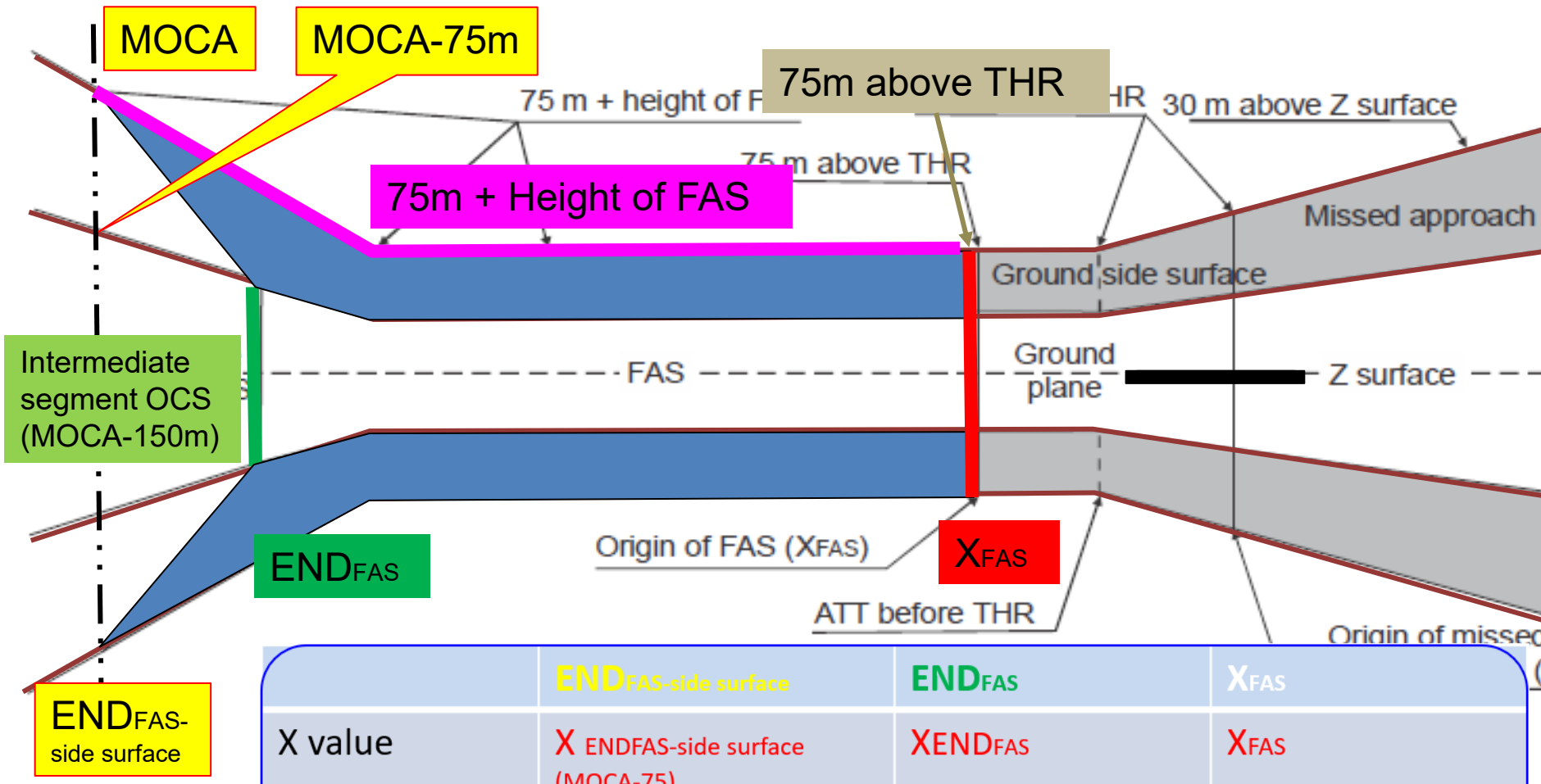


FAS SIDE SURFACE : VALUE OF HI

Vertical System Error

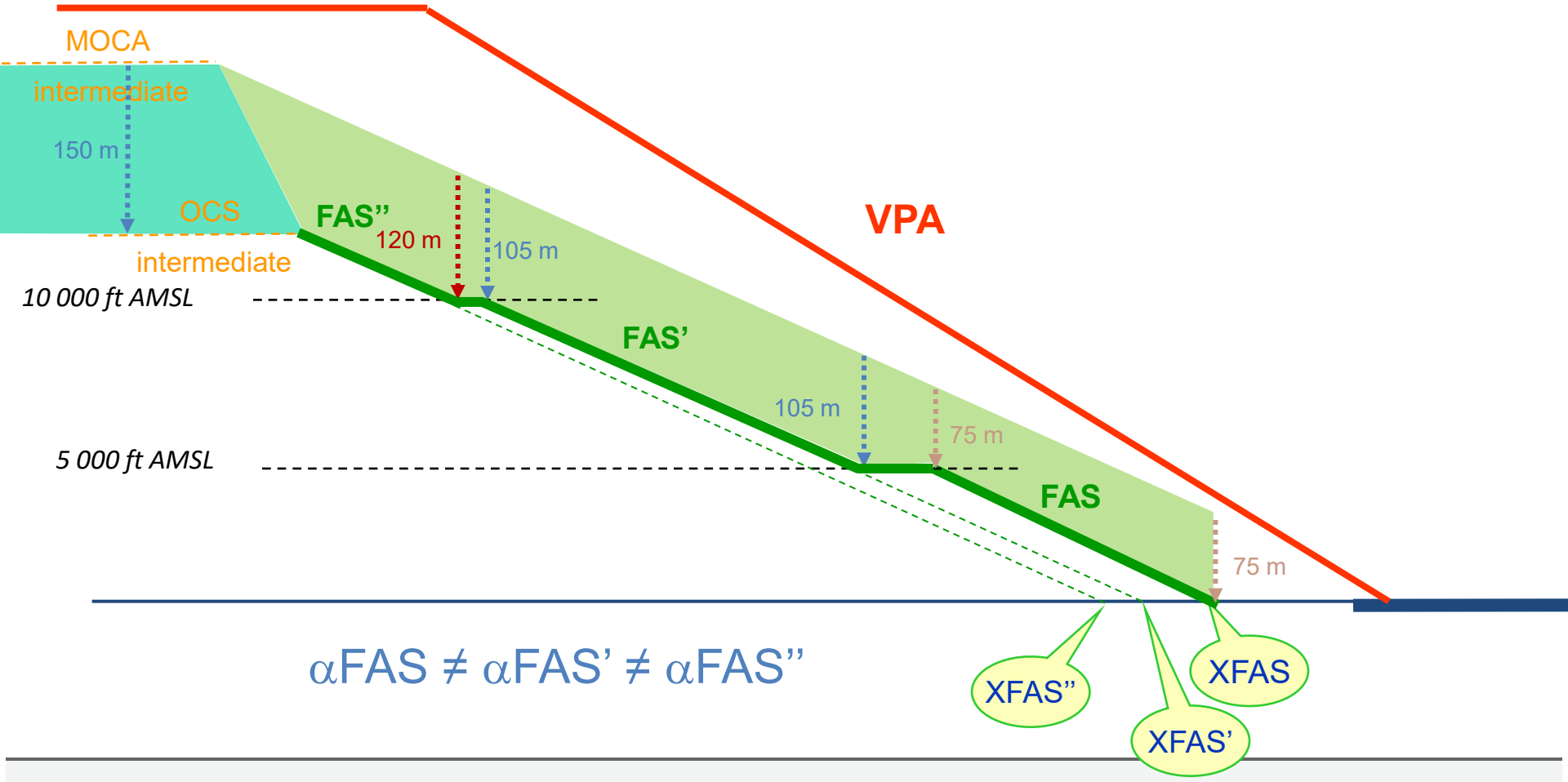
- Hi can have 3 different values :
  - Hi = H_0 = 75 m below 5 000’ AMSL,
  - Hi = H_{5000} = 105 m between 5 000’ and 10 000’ AMSL
  - Hi = H_{10000} = 120 m at or above 10 000’ AMSL.

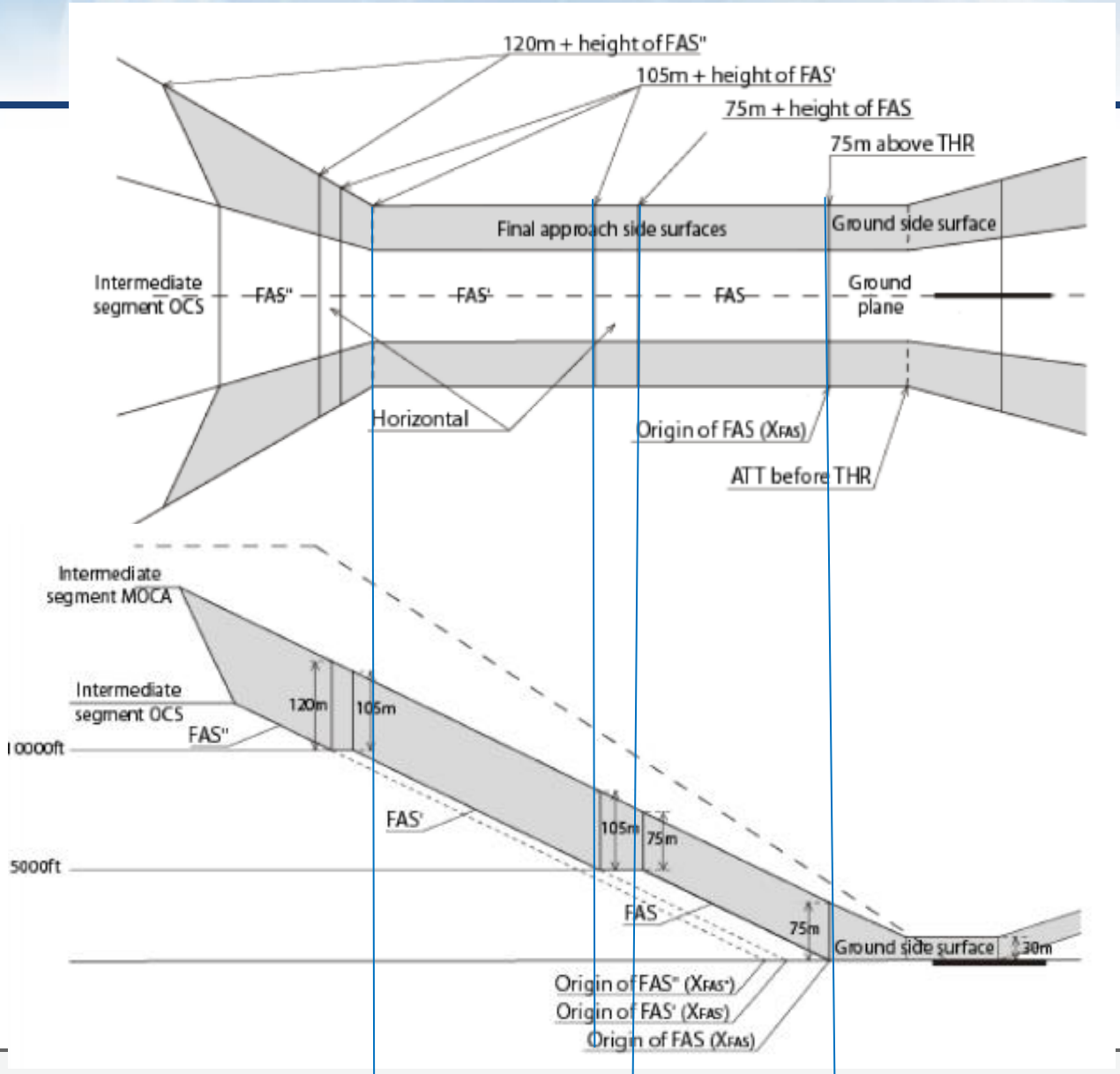
Note : Total vertical error of the system (including airborne equipment error and FTEs) must be less than Hi on a 99.7% probability basis.



	ENDFAS-side surface	ENDFAS	XFAS
X value	X ENDFAS-side surface (MOCA-75)	XENDFAS	XFAS
Z value (H)	MOCA (intermediate seg.)	Intermediate OCS (P) OCS +75m (S)	0m (P) 75m (S)

FAS SIDE SURFACE : VALUE OF HI




120m + height of FAS"
105m + height of FAS'
75m + height of FAS
75m above THR
Final approach side surfaces
Ground side surface
Intermediate segment OCS
FAS"
FAS'
FAS
Ground plane
Horizontal
Origin of FAS (XFAS)
ATT before THR
Intermediate segment MOCA
Intermediate segment OCS
FAS"
10000ft
120m
105m
FAS'
105m
75m
5000ft
FAS
75m
Ground side surface
30m
Origin of FAS" (XFAS")
Origin of FAS' (XFAS')
Origin of FAS (XFAS)

FAS : SUMMARY

DATA :

- ALT FAP
- ALT THR
- MIN TEMPERATURE
- MAX TEMPERATURE
- VPA
- CAT Aircraft
- RDH

CALCULATION :

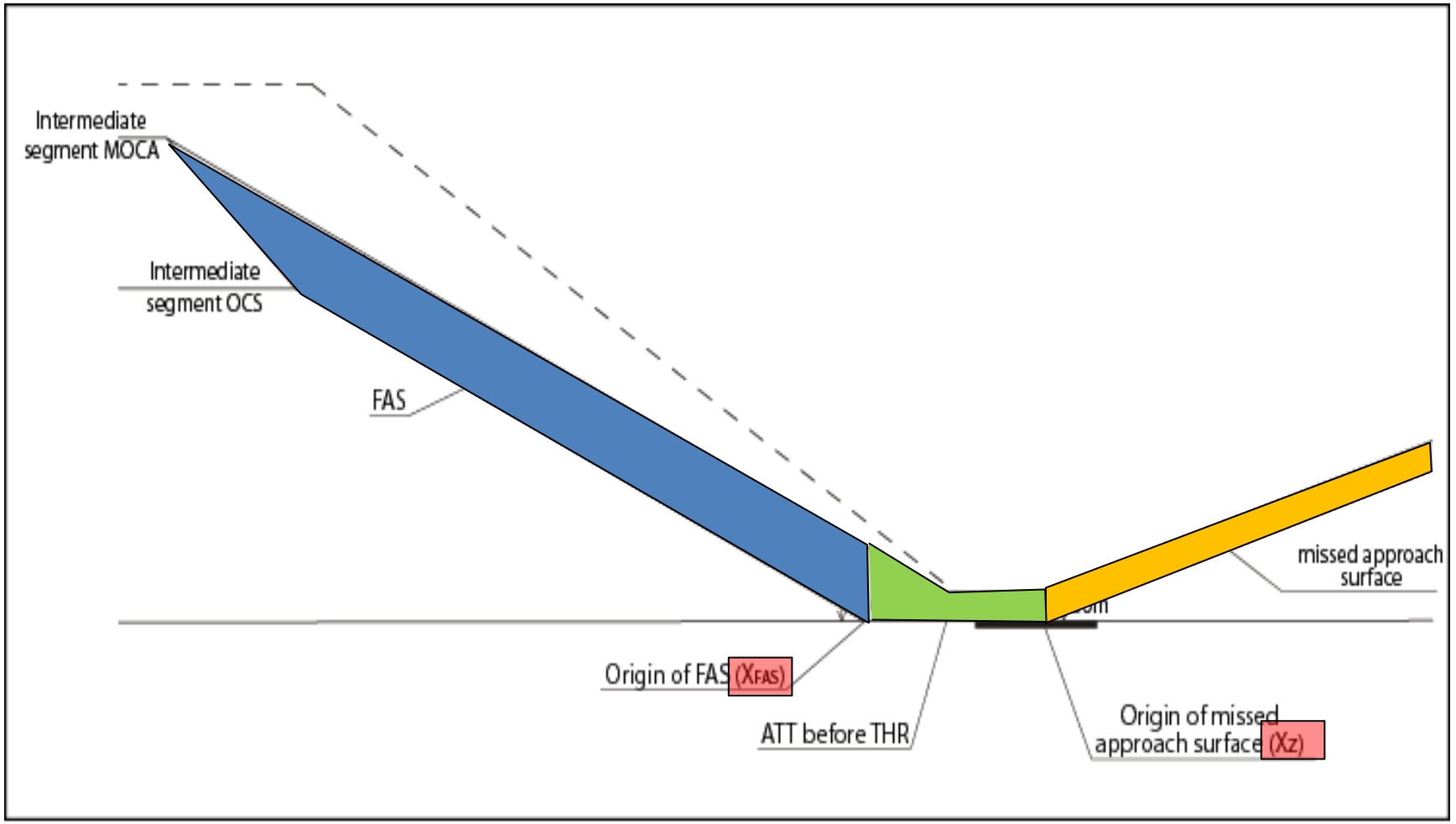
- Calculate Δh
- Check VPA min
- Check VPA max
- Calculate FAS Origin :
  - X_{fas} ($X_{fas'}$ *and* $X_{fas''}$ if needed)
- Calculate FAS gradient :
  - αFAS (αFAS' and αFAS'' if needed)

Height of FAS surface at range X : $h_{FAS} = (X- X_{FAS}).\tan \alpha_{FAS}$

Height of FAS Side surface at range X,Y : $h_{side(x,y)} = h_{FAS(x)}$ + (% of Hi)

If $H_{obst} > h_{OAS}$ => consider this obstacle for OCH computation

SIDES SURFACES



HORIZONTAL PLANE or GROUND PLANE

- Starts at X_{FAS}
- Ends at X_z

Xz = - 900 m for Cat A and B
Xz = - 1100 m for Cat C
Xz = - 1400 m for Cat D
} (1)

For an airfield elevation higher than 900 m (2 953 ft) or a promulgated VPA above 3.2° ,
Xz shall be determined by applying the following formula :

Xz = min { value in (1) ; [(HL-RDH)/tanVPA] – [ATT + (2*TAS*sinVPA / γ *(TAS +Vw)] }

- TAS at ISA + 15°
- γ = vertical deceleration [0.08g (2.56 ft/sec^2 or 0.78m/sec^2)]
- Vw = 10 kt

! units

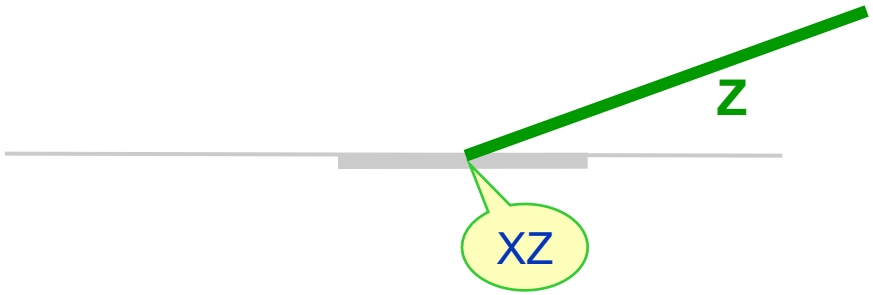
MISSED APPROACH SURFACE

- Intermediate missed approach surface
  - Starts at X_z
  - Ends at earliest TP or Turing Altitude
  - Climb gradient : 2.5 %
    - *Could be adjusted up to 5%*

- Hz = -(x - Xz) * 0.025

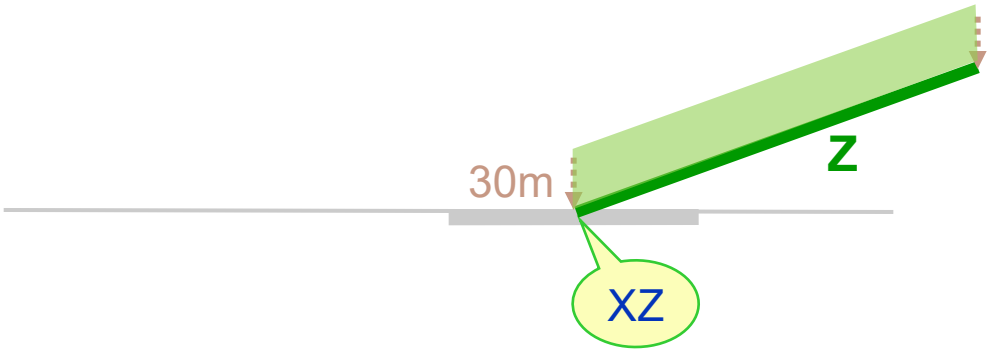
Xz = - 900 m for Cat A and B
Xz = - 1100 m for Cat C
Xz = - 1400 m for Cat D

(1)

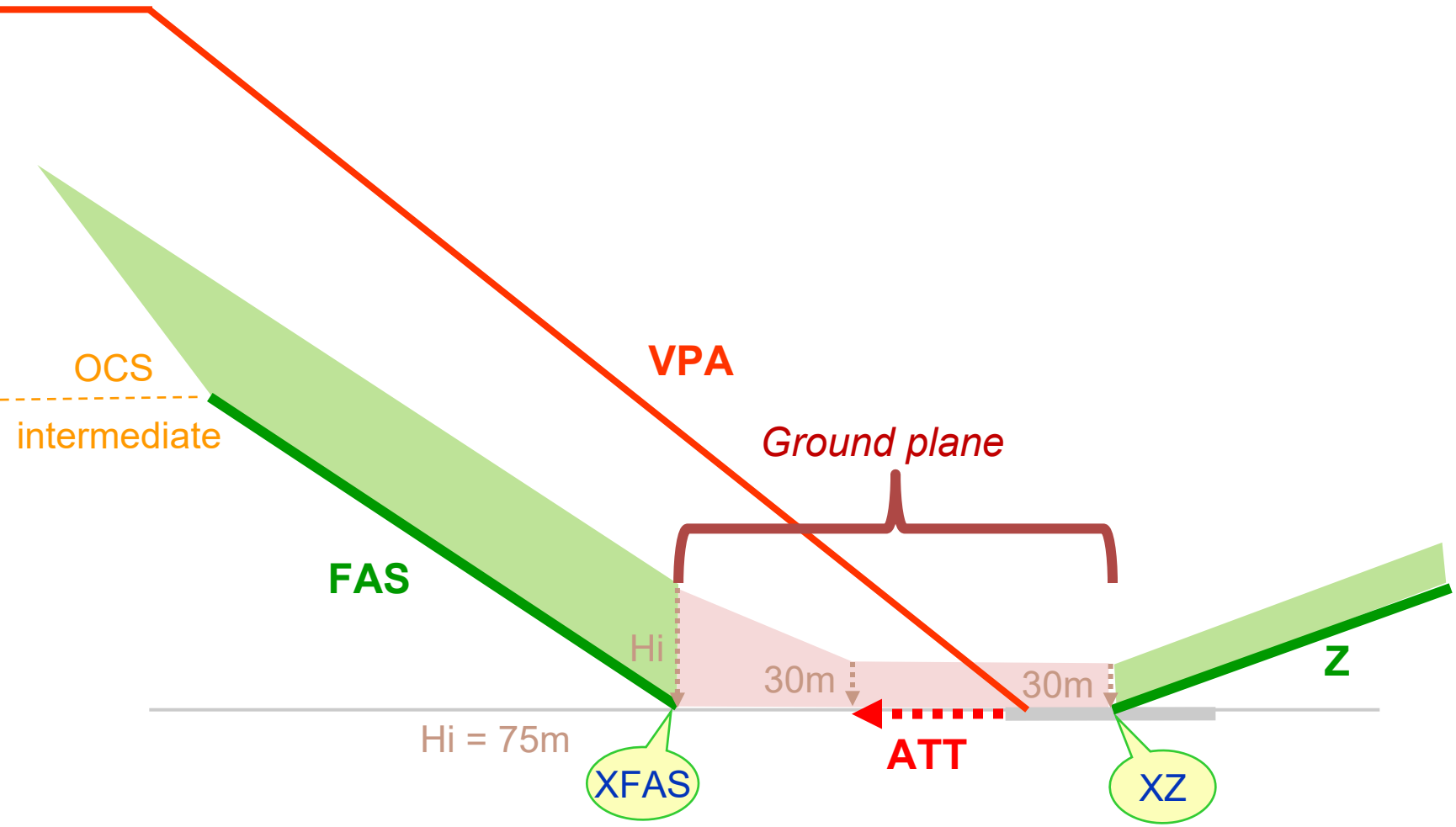


MISSED APPROACH SURFACE AND SIDE SURFACE

- After Xz :
  - Height of edge of secondary area 30m higher than height of primary area



GROUND PLANE AND SIDE SURFACE



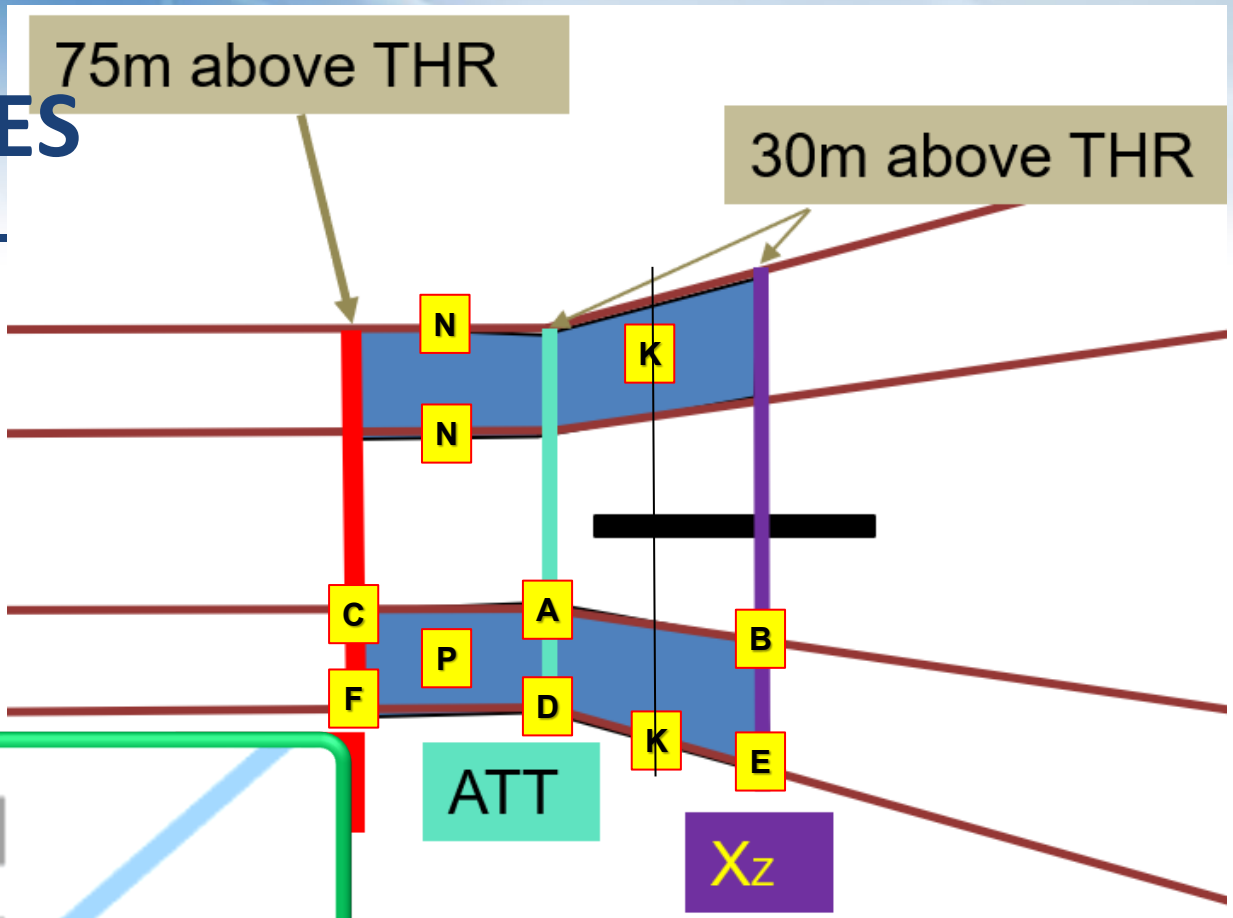
GROUND PLANE AND SIDE SURFACE

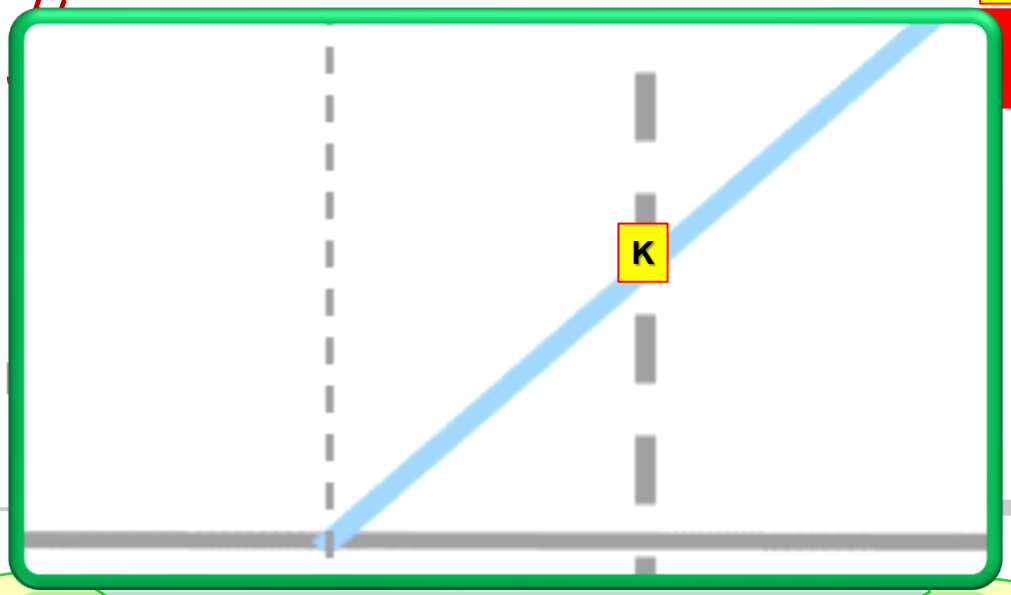
- Between XFAS and ATT before THR
  - Height of edge of secondary area between:
    - 75m at XFAS location
    - 30m at ATT before THR

- Between ATT before THR and Xz
  - Height of edge of secondary area = 30m

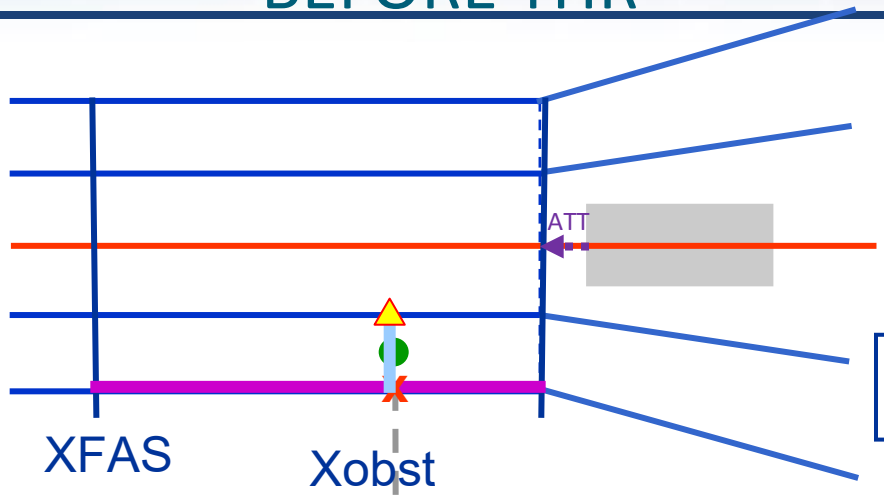
- **Primary area of ground plane → z=0m**

SIDES SURFACES

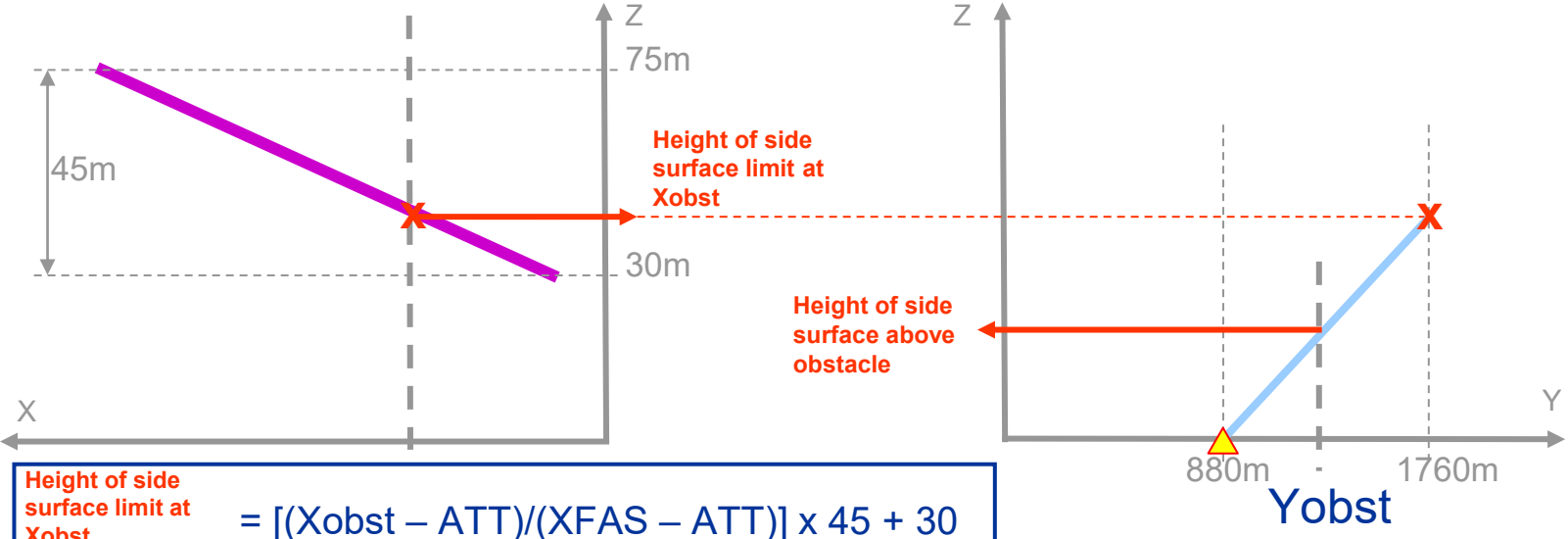




HEIGHT IN SIDE SURFACE BETWEEN XFAS AND ATT BEFORE THR

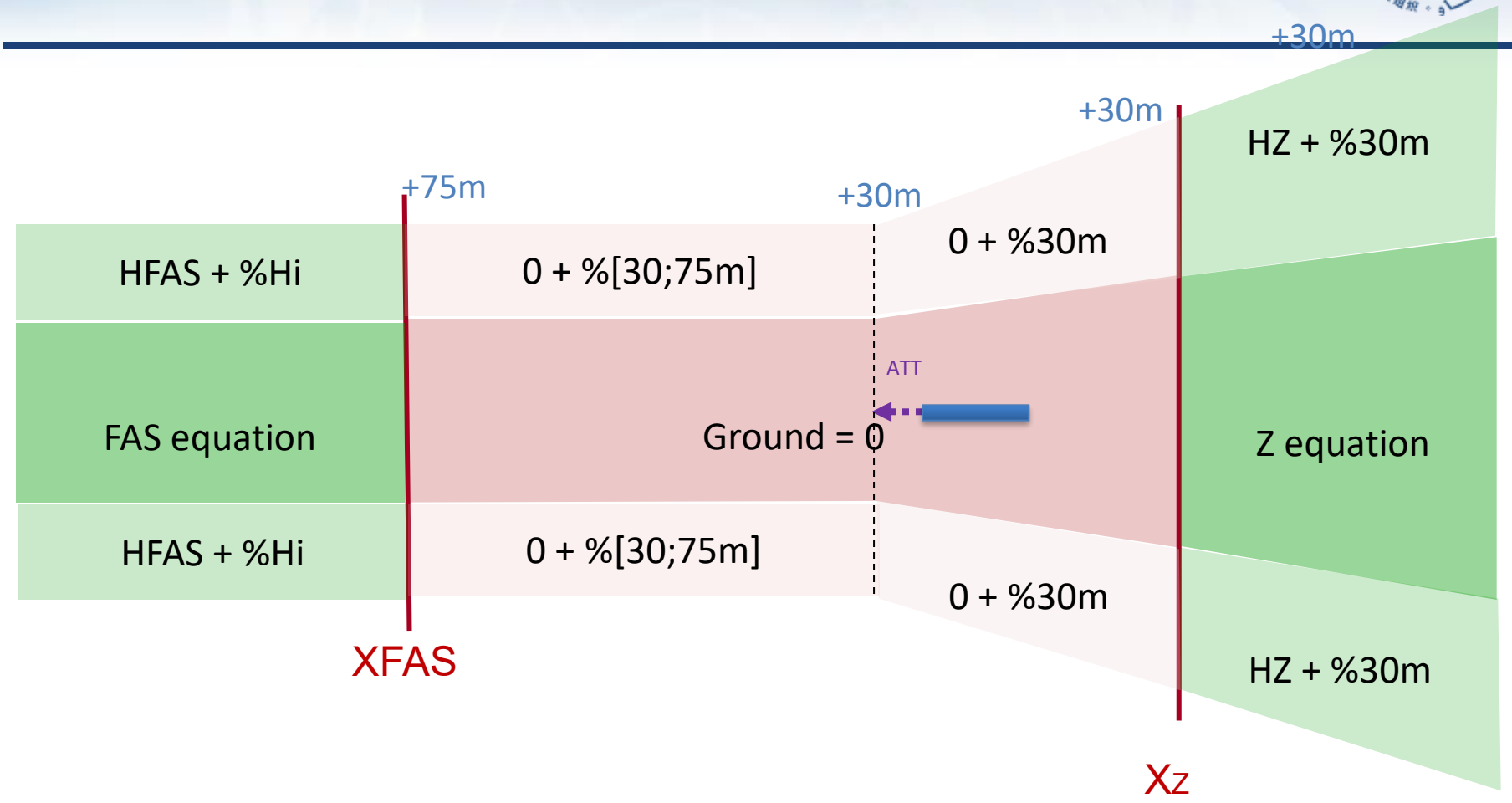


Height of side surface above obstacle = [(Yobst – 880)/880] x **Height of side surface limit at Xobst**



Height of side surface limit at Xobst = [(Xobst – ATT)/(XFAS – ATT)] x 45 + 30

SURFACES: SUMMARY



Ground/Z surface : EXERCISE

Conditions： CAT C Aircraft， Xfas=1589m, αFAS =2.034° ， 2.5% missed approach surface

Questions： Obstacles penetrate the ground/Z surface or not?

OBs	XYZ	APV surface central/side	H surface	penetrate
O1	(1000,1000,10)			
O2	(0,-400,20)			
O3	(-2000,-1400,35)			

DETERMINATION OF OCH FOR APV SEGMENT

PART III SECTION 3 CHAPTER 4.4

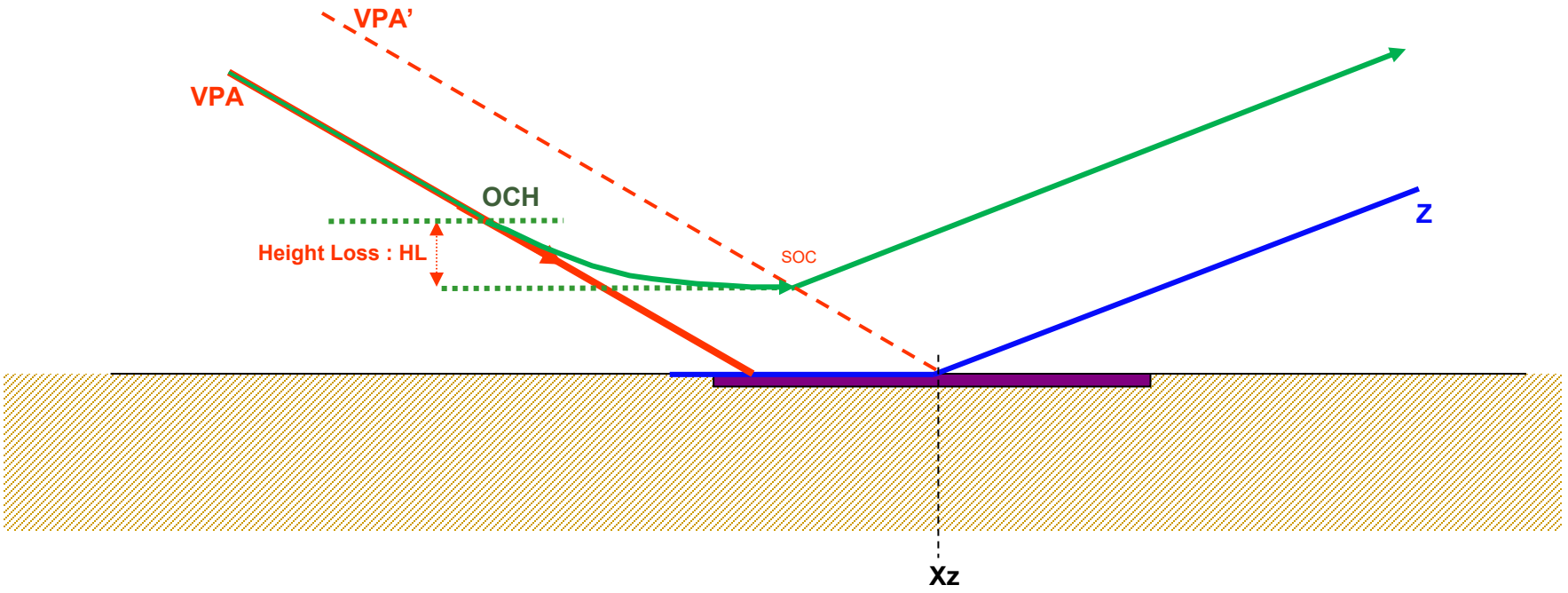
CATEGORIZATION OF OBSTACLES : APPROACH OR MISSED APPROACH OBSTACLES

- Approach Obstacles : Before Xz
- Missed approach Obstacles : After Xz

- But : Obstacles located before Xz may be considered as missed approach obstacles if they penetrate VPA', parallel to the promulgated VPA and with origin at Xz.

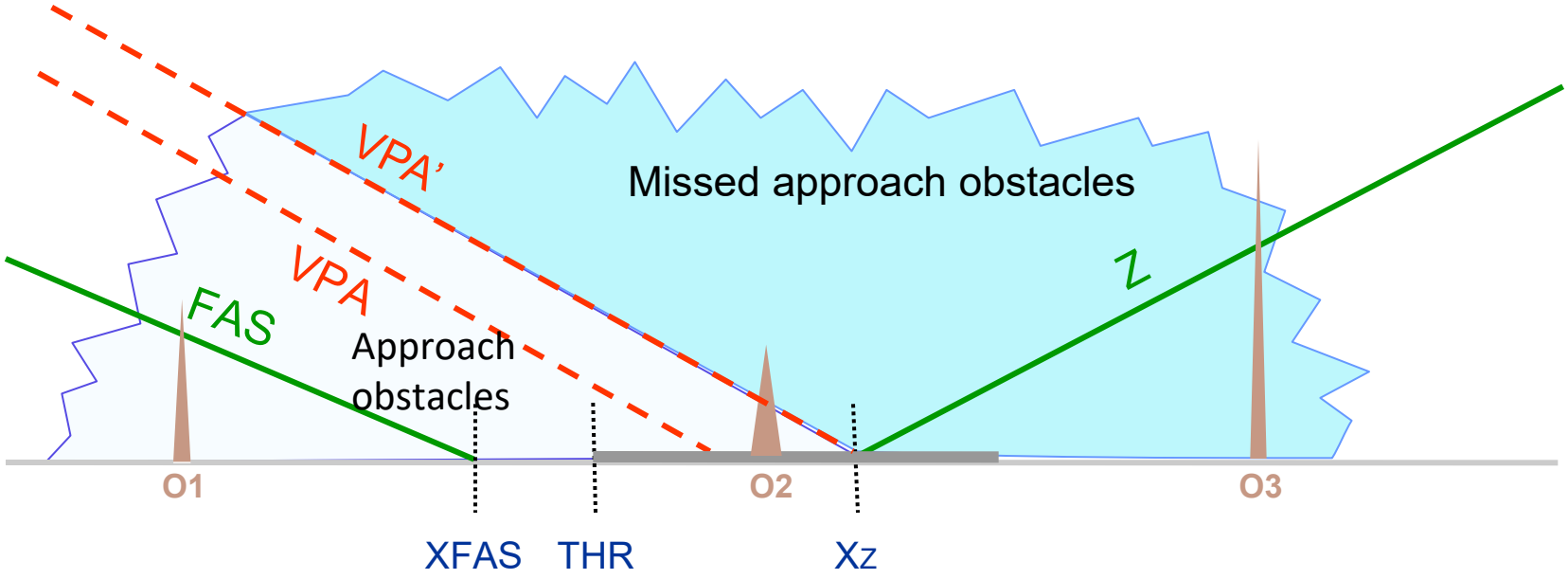
  i.e. obstacle height greater than [(X-Xz) tanVPA]

VPA’



CATEGORIZATION OF OBSTACLES :
APPROACH OR MISSED APPROACH OBSTACLES

$$VPA' : H_{VPA'} = (x - Xz) \tan VPA$$



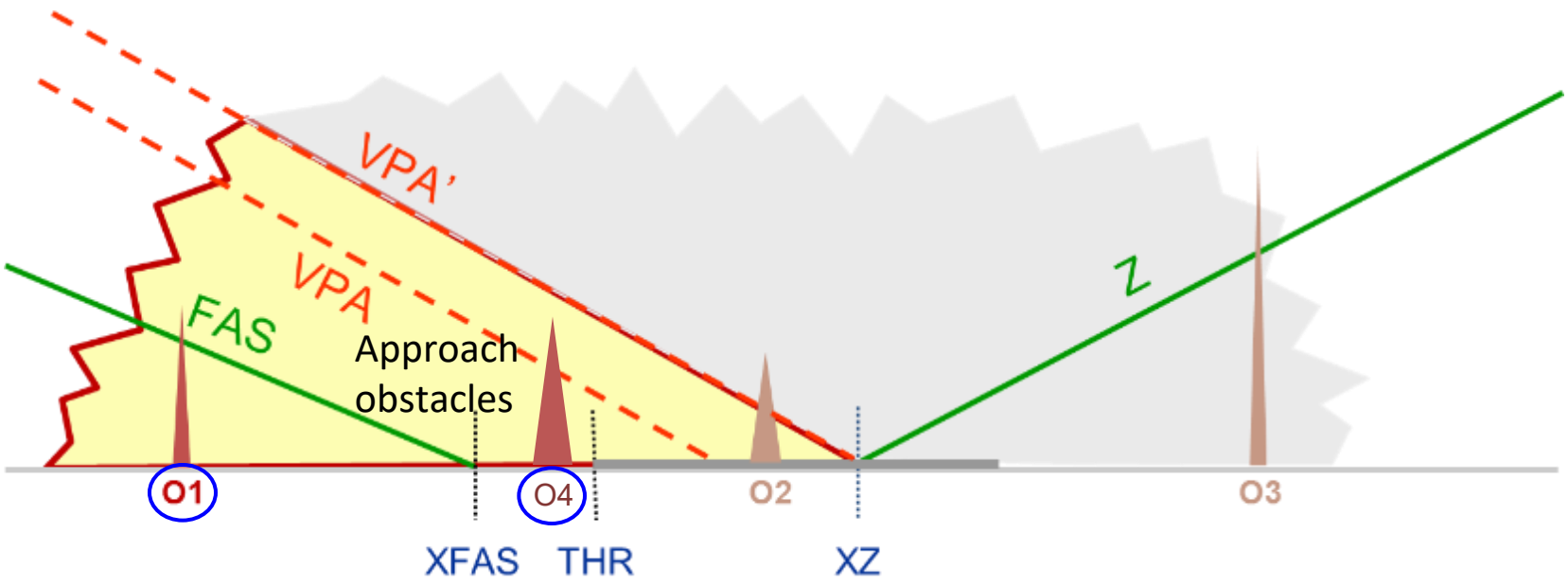
Approach Obstacle if

hobst ≤ (x - Xz) tan VPA

Missed approach Obstacles if

hobst > (x - Xz) tan VPA

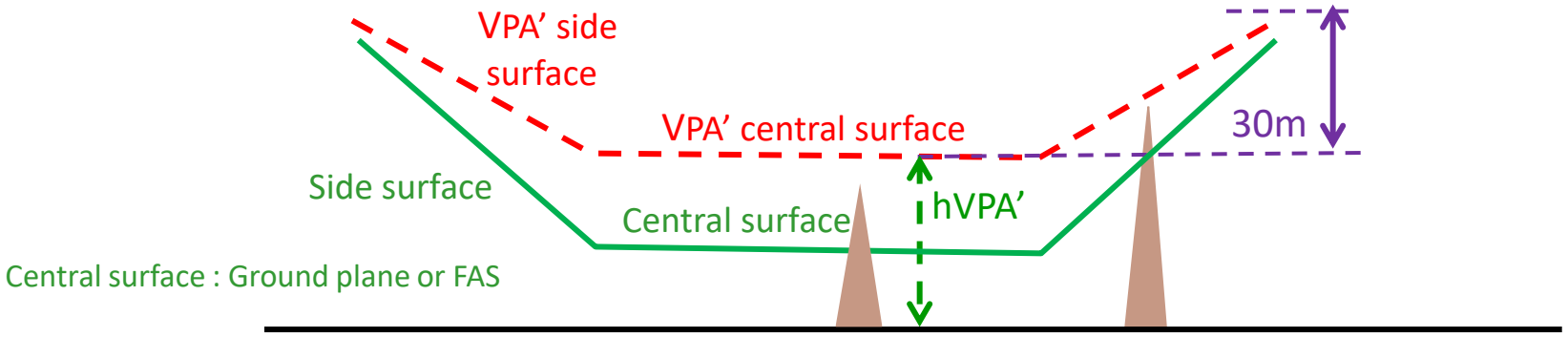
OBSTACLES BEFORE XZ no penetrating VPA'



O2, how about side surface? Side surface is ____ meters above the VPA' surface.

OBSTACLES BEFORE XZ below VPA' surfaces

Approach obstacles because lower than VPA'



Central surface :
hVPA' central =[(Xobst-Xz) tanVPA]

Side surfaces :
hVPA'= hVPA' central +[(ABS(Yobst) - Yprimary) / Yprimary] x 30

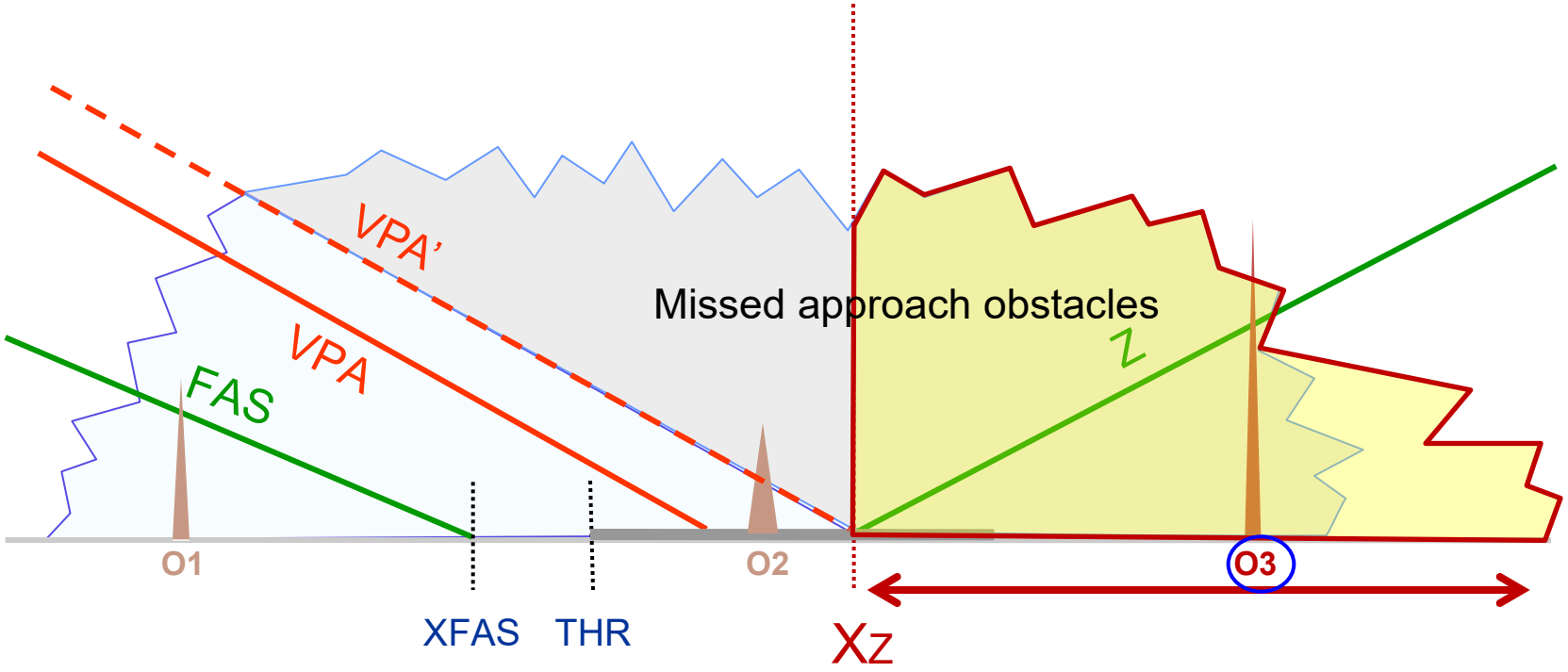
Obstacle penetrating FAS or ground central surface :

OCH = hobst + HL

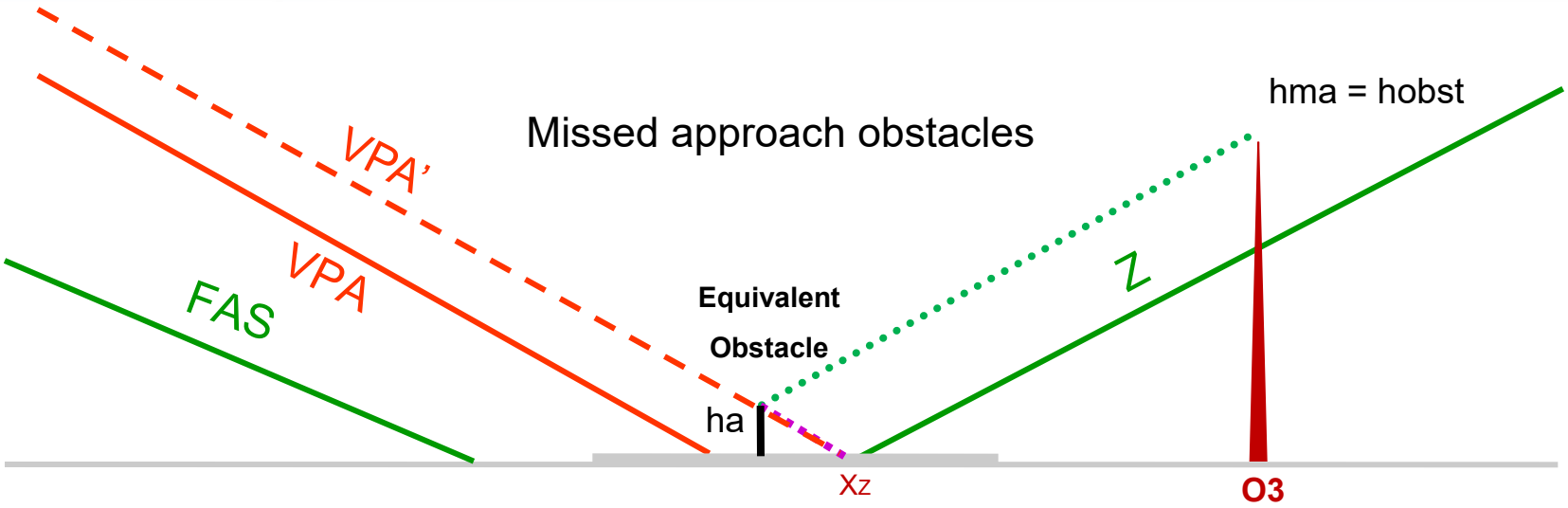
Obstacle penetrating FAS or ground plane **side surfaces** :

OCH = hobst + %HL

OBSTACLES AFTER XZ penetrating Z surface



OBSTACLES AFTER XZ penetrating **CENTRAL SURFACE**



Central surface : Height of Z central surface =[(Xobst-Xz) tanZ]

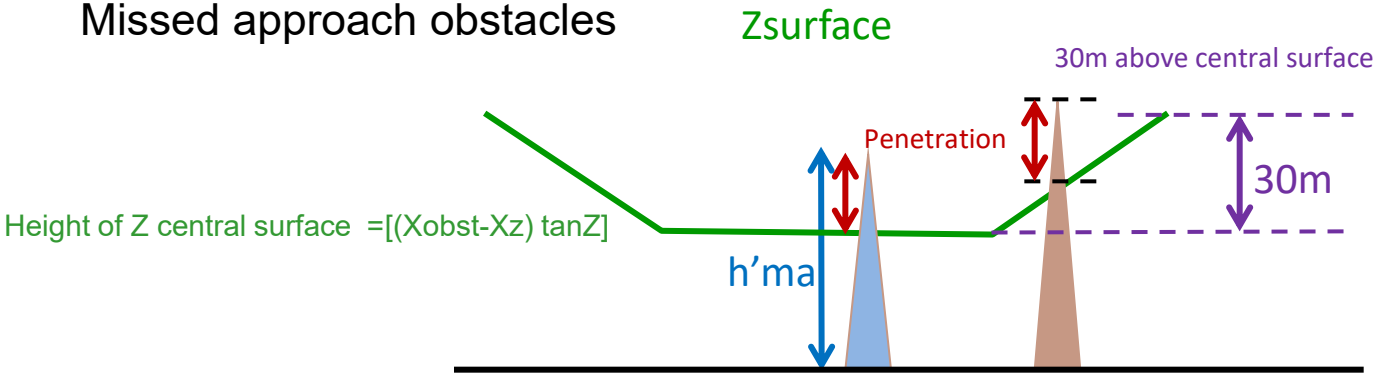
Computation of ha : height in approach (Equivalent height of the obstacle in approach: Same OCH)

$$ha = [(hma / \tan Z) + (Xobst - Xz)] / [(1/\tan Z) + (1/\tan VPA)]$$

$$OCH = ha + HL$$

OBSTACLES AFTER XZ penetrating **SIDE SURFACES**

Missed approach obstacles



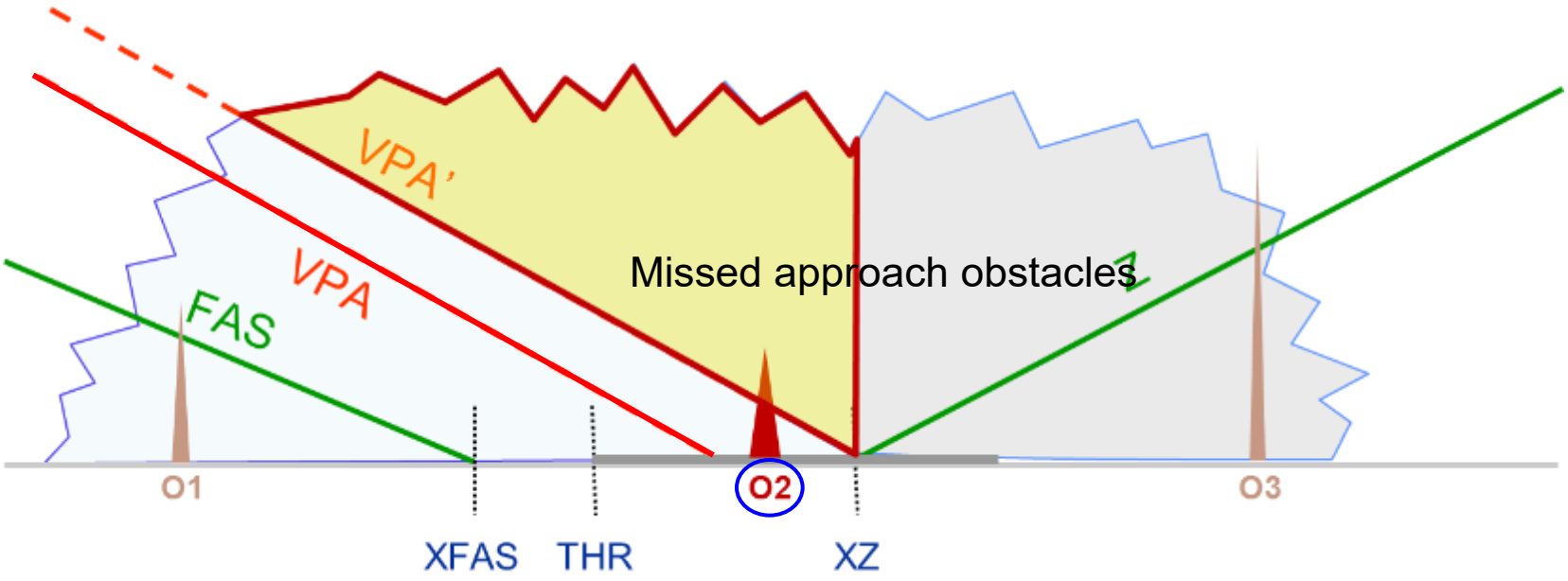
Height of Z side surface = height of Z central surface + [(ABS(Yobst) - Yprimary) / Yprimary] x 30
with height of Z central surface =[(Xobst-Xz) tanZ]
and with Yprimary = Ysecondary / 2 and Ysecondary = (0,95NM*1852) + (ATT-Xobst) x tan(15°)

1- Computation of corresponding h'ma : h'ma = height of Z central surface + penetration

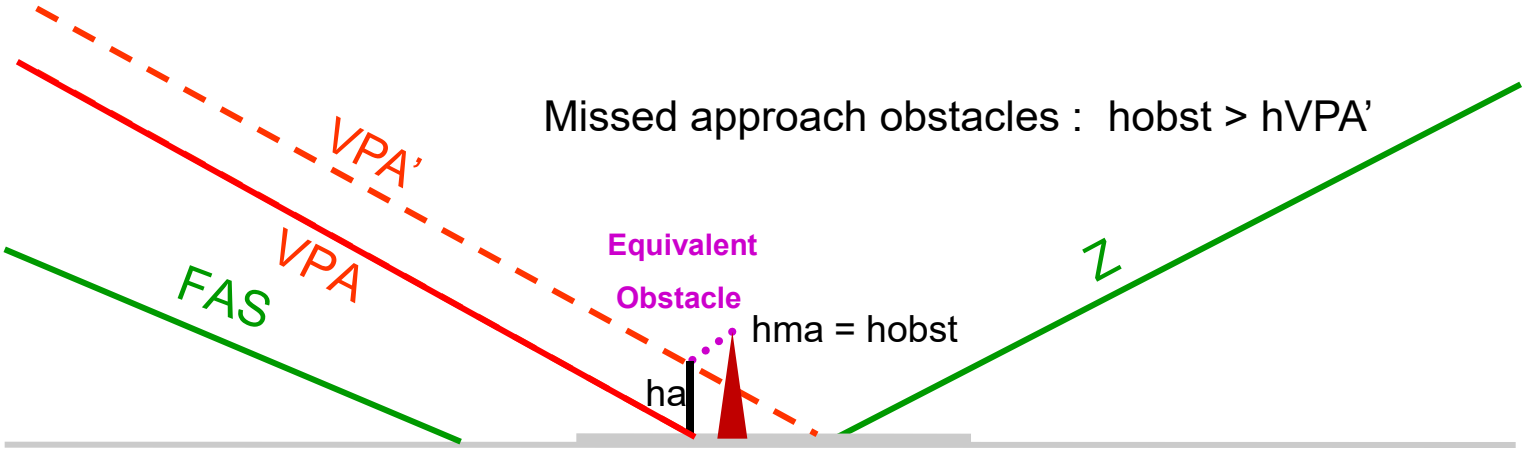
2- Computation of ha : **ha = [(h'ma / tanZ) + (Xobst - Xz)] / [(1/tanZ) + (1/tanVPA)]**

3- OCH = ha + HL

OBSTACLES BEFORE XZ penetrating VPA'



OBSTACLES BEFORE XZ penetrating VPA' **CENTRAL** SURFACE



Central surface : hVPA' central =[(Xobst-Xz) tanVPA]

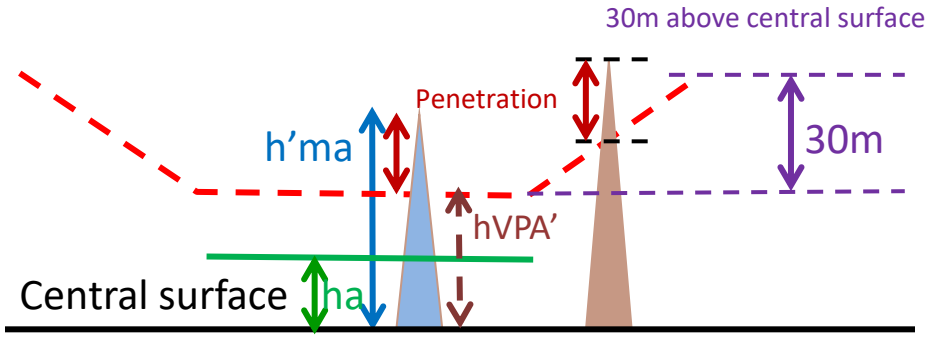
Computation of ha : height in approach (Equivalent height of the obstacle in approach: Same OCH)

$$ha = [(hma/ \tan Z) + (Xobst - Xz)] / [(1/\tan Z) + (1/\tan VPA)]$$

$$OCH = ha + HL$$

OBSTACLES BEFORE XZ penetrating VPA'

SIDE SURFACES



Missed approach obstacles because higher than VPA' side surfaces

Central surface :
hVPA' central =[(Xobst-Xz) tanVPA]

Side surfaces :
hVPA'= hVPA' central +[(ABS(Yobst) - Yprimary) / Yprimary] x 30

1- Computation of corresponding h'ma : hVPA' central surface + penetration

2- Computation of ha : **ha = [(h'ma / tanZ) + (Xobst - Xz)] / [(1/tanZ) + (1/tanVPA)]**

3- OCH = ha + HL

OBSTACLE ASSESSMENT : OCH

OCH = max of all individual OCH

(final and missed approach obstacles)

OCH : CALCULATION METHOD

- Assessment of penetrating obstacles
  - $H_o > H_{oas}$
- Identification of approach obstacles and missed approach obstacles
- Calculation of equivalent obstacle for Missed approach obstacles
- Calculation of OCH using HL

HEIGHT LOSS MARGINS

PART III SECTION 3 CHAPTER 4.5

HEIGHT LOSS

Aircraft Category	Pressure altimeter		Radio altimeter *	
A	40 m	130 ft	13 m	42 ft
B	43 m	142 ft	18 m	59 ft
C	46 m	150 ft	22 m	71 ft
D	49 m	161 ft	26 m	85 ft

* Only for correction to high airfield elevation and steep angles

HEIGHT LOSS: INFLUENCE OF AIRPORT ALTITUDE ON HL

- For airfield elevation > 900 m (2953 ft)
- HL value increased by 2% of the radio altimeter margin HLr per 300 m (984 ft) airfield elevation

$$\text{Correction} = HL_r \times (2/100) \times (Alt_{A/D}/\ 300)$$

HEIGHT LOSS: INFLUENCE OF GP ANGLE ON HL

- For steep Glide Path $> 3{,}2°$
- HL value increased by 5% of the radio altimeter margin per 0.1° increase in VPA (between 3.2° and 3.5°)

$$\text{Correction} = HL_r \times (5/100) \times [(VPA-3.2) / 0.1]$$

BARO-VNAV OFFSET PROCEDURES

PART III SECTION 3 CHAPTER 4.5

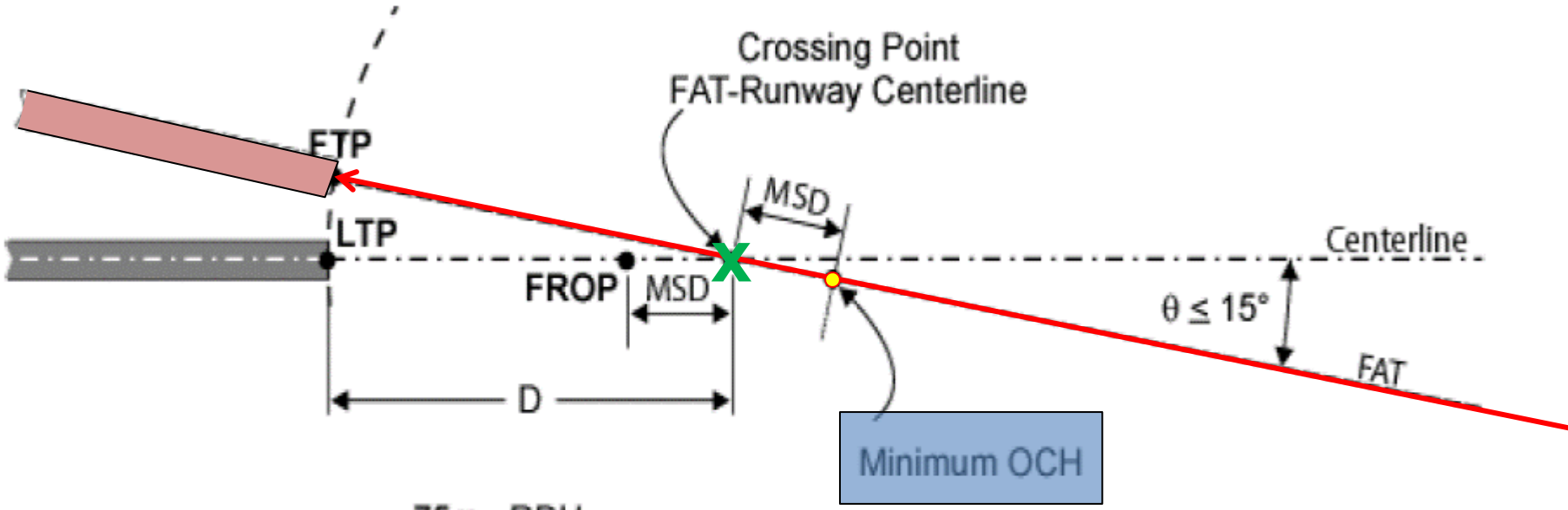
BARO-VNAV Offset Procedures

- In certain cases it may not be physically practicable to align the final approach segment with the runway centerline because of obstacle problems.
- An offset final approach track shall not be established as a noise abatement measure.

BARO-VNAV Offset Procedures

- The final approach track shall intersect the runway extended centerline:
  - a) at an angle not exceeding 15 degrees; and
  - b) at a distance D before threshold providing at least a minimum stabilization distance (MSD) before the FROP where the promulgated VPA reaches a height of 75 m (246 ft) above threshold elevation .
- The minimum stabilization distance (MSD) is the sum of L1 and L2.
  - L1= rtan(θ/2);and
  - L2=3*V/3600

BARO-VNAV Offset Procedures



$$D \geq \frac{75m - RDH}{\tan VPA} + MSD$$

$$MSD = r \times \tan(\theta/2) + 3 \times V/3600$$

$$\text{Minimum OCH} = RDH + D \times \tan VPA + MSD \times \tan VPA$$

BARO-VNAV Offset Procedures

- L1 is the distance between the intercept point and the end of the turn
- L2 is a 3 second delay to take into account the roll out distance
- L1 = r * tan (θ/2)
- L2 = 3 * V/3 600
  - r = turn radius calculated with a 15° bank angle and the TAS (at aerodrome elevation) corresponding to the final approach IAS + 19 km/h (10 kt)
  - θ = turn angle

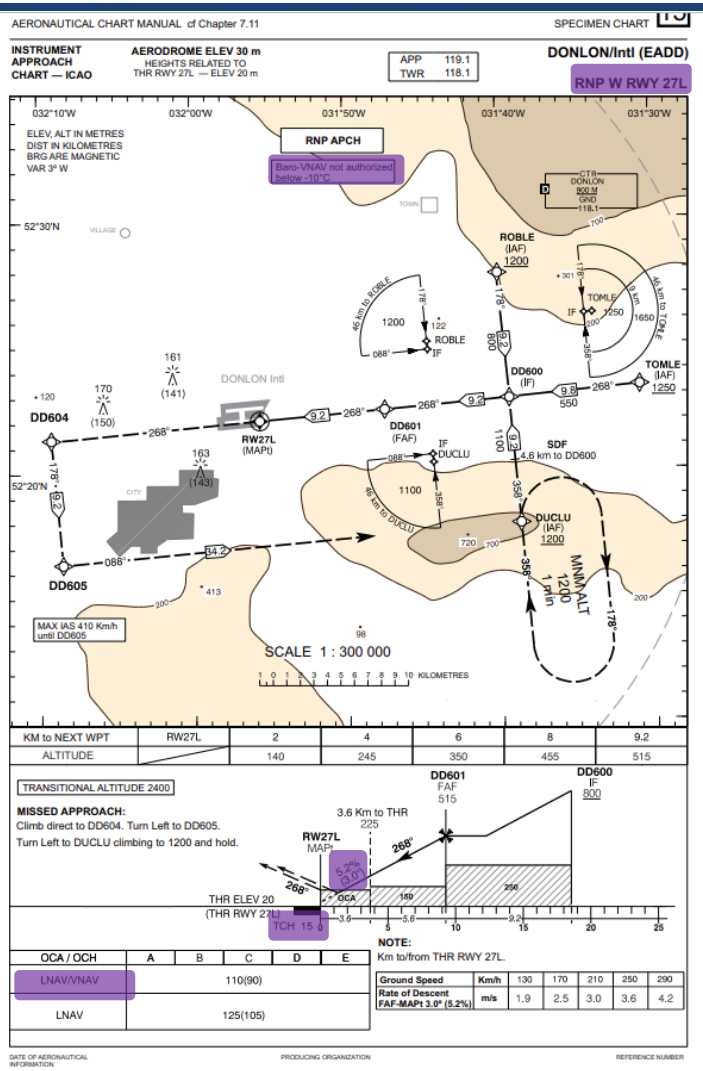
BARO-VNAV Offset Procedures

- **Obstacle clearance criteria :**
- **a) all the obstacle clearance surfaces and calculations are based on a fictitious runway aligned with the final approach track. This fictitious runway has the same landing threshold elevation as the real one;**
- **b) the OCA/H for this procedure shall be at least equal to altitude/height of the promulgated VPA at the intercept point plus MSD * tan VPA.**
  - **Minimum OCH= D *tan VPA +RDH + MSD * tan VPA**

Promulgation

- Title : RNP RWYNN
- Minimum box
- RDH
- VPA :
  - X.XX° for databases
  - X.X° for charting
- Min temperature

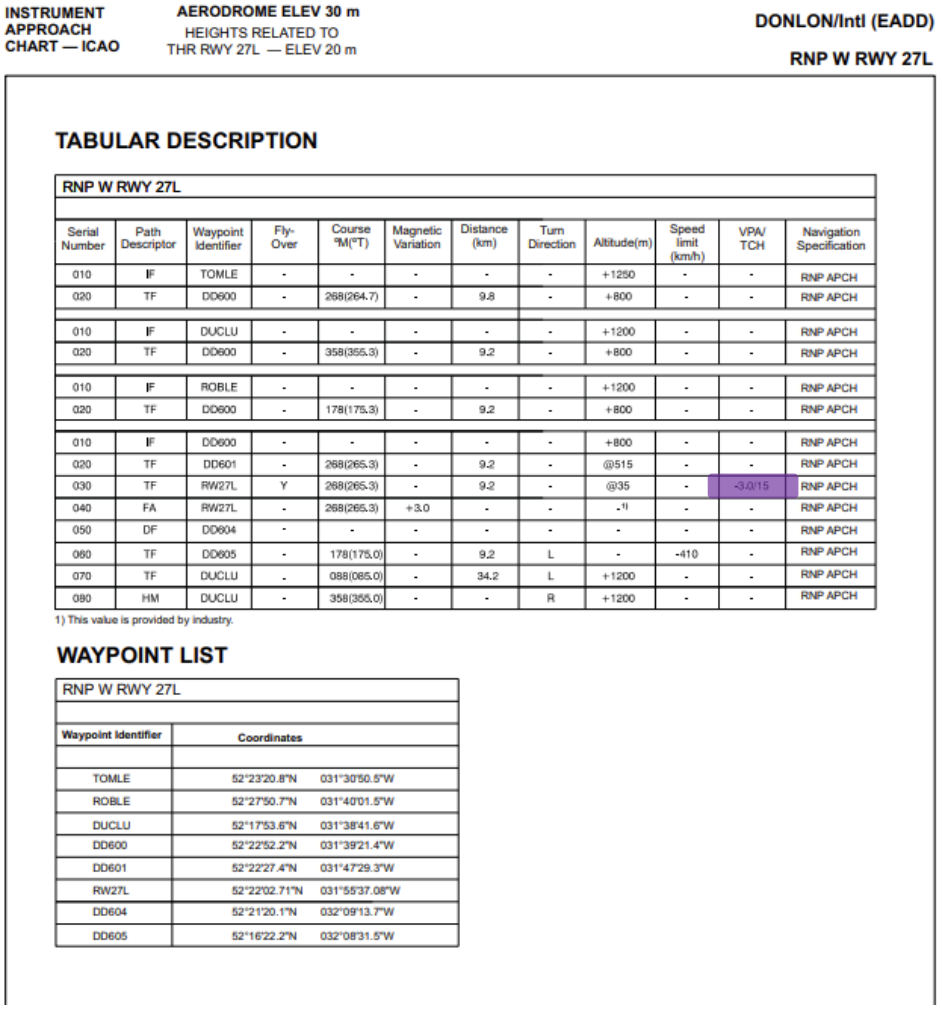
  Temperatue above which the effective VPA will exceed 3.5° (only if this value is possible)



Promulgation

- Title : RNP RWYNN
- Minimum box
- RDH
- VPA :
  - X.XX° for databases
  - X.X° for charting
- Min temperature

  Temperatue above which the effective VPA will exceed 3.5° (only if this value is possible)



INSTRUMENT APPROACH CHART — ICAO

AERODROME ELEV 30 m
HEIGHTS RELATED TO THR RWY 27L — ELEV 20 m

DONLON/Intl (EADD)
RNP W RWY 27L

TABULAR DESCRIPTION

RNP W RWY 27L

Serial Number	Path Descriptor	Waypoint Identifier	Fly-Over	Course °M(°T)	Magnetic Variation	Distance (km)	Turn Direction	Altitude(m)	Speed limit (km/h)	VPA/ TCH	Navigation Specification
010	IF	TOMLE	-	-	-	-	-	+1250	-	-	RNP APCH
020	TF	DD600	-	268(264.7)	-	9.8	-	+800	-	-	RNP APCH
010	IF	DUCLU	-	-	-	-	-	+1200	-	-	RNP APCH
020	TF	DD600	-	358(355.3)	-	9.2	-	+800	-	-	RNP APCH
010	IF	ROBLE	-	-	-	-	-	+1200	-	-	RNP APCH
020	TF	DD600	-	178(175.3)	-	9.2	-	+800	-	-	RNP APCH
010	IF	DD600	-	-	-	-	-	+800	-	-	RNP APCH
020	TF	DD601	-	268(265.3)	-	9.2	-	@515	-	-	RNP APCH
030	TF	RW27L	Y	268(265.3)	-	9.2	-	@35	-	-3.0/15	RNP APCH
040	FA	RW27L	-	268(265.3)	+3.0	-	-	-[1]	-	-	RNP APCH
050	DF	DD604	-	-	-	-	-	-	-	-	RNP APCH
060	TF	DD605	-	178(175.0)	-	9.2	L	-	-410	-	RNP APCH
070	TF	DUCLU	-	088(085.0)	-	34.2	L	+1200	-	-	RNP APCH
080	HM	DUCLU	-	358(355.0)	-	-	R	+1200	-	-	RNP APCH

1) This value is provided by industry.

WAYPOINT LIST

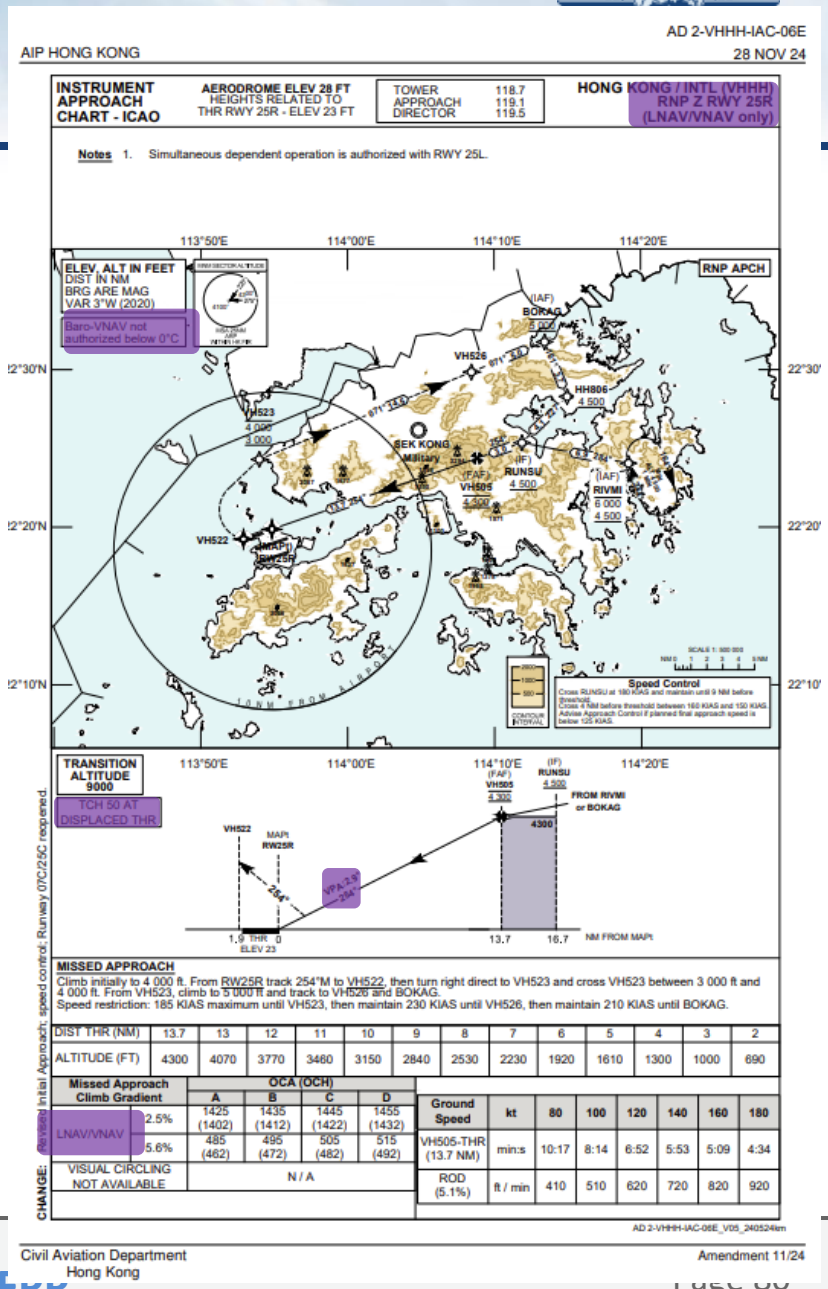
RNP W RWY 27L

Waypoint Identifier	Coordinates	
TOMLE	52°23'20.8"N	031°30'50.5"W
ROBLE	52°27'50.7"N	031°40'01.5"W
DUCLU	52°17'53.6"N	031°38'41.6"W
DD600	52°22'52.2"N	031°39'21.4"W
DD601	52°22'27.4"N	031°47'29.3"W
RW27L	52°22'02.71"N	031°55'37.08"W
DD604	52°21'20.1"N	032°09'13.7"W
DD605	52°16'22.2"N	032°08'31.5"W

Promulgation

- Title : RNP RWY**NN**
- Minimum box
- RDH
- VPA :
  - X.XX° for databases
  - X.X° for charting
- Min temperature

  Temperatue above which the effective VPA will exceed 3.5° (only if this value is possible)



Promulgation

- Title : RNP RWYNN
- Minimum box
- RDH
- VPA :
  - X.XX° for databases
  - X.X° for charting
- Min temperature

Temperatue above which the effective VPA will exceed 3.5 (only if this value is possible)

RNP Z RWY 25R APPROACH

TABULAR DESCRIPTION: RNP Z RWY 25R

Serial Number	Path Descriptor	Waypoint Identifier	Fly-over	Course °M (°T)	Magnetic Variation	Distance (NM)	Turn Direction	Altitude (ft)	Speed (KIAS)	VPA	Navigation Specification
01	IF	RIVMI	-	-	+3.0	-	-	-6000 +4500	-	-	RNP APCH
02	TF	RUNSU	-	284 (281)	+3.0	6.9	-	+4500	@180	-	RNP APCH
01	IF	BOKAG	-	-	+3.0	-	-	@5000	@210	-	RNP APCH
02	TF	HH806	-	161 (158)	+3.0	3.7	-	+4500	-	-	RNP APCH
03	TF	RUNSU	-	227 (224)	+3.0	4.1	-	+4500	@180	-	RNP APCH
01	IF	RUNSU	-	-	+3.0	-	-	+4500	@180	-	RNP APCH
02	TF	VH505	-	254 (251)	+3.0	3.0	-	@4300	@180	-	RNP APCH
03	TF	RW25R	Y	254 (251)	+3.0	13.7	-	@73	-	-2.9	RNP APCH
04	CF	VH522	Y	254 (251)	+3.0	1.9	-	-	-	-	RNP APCH
05	DF	VH523	-	-	+3.0	-	R	-4000 +3000	@185	-	RNP APCH
06	TF	VH526	-	071 (068)	+3.0	14.5	-	-	@230	-	RNP APCH
07	TF	BOKAG	-	071 (068)	+3.0	5.0	-	@5000	@210	-	RNP APCH

WAYPOINT LIST

RNP Z RWY 25R		
Waypoint Identifier	**Coordinates (WGS-84)**	
RIVMI (IAF)	22 24 03.96N	114 19 09.28E
BOKAG (IAF)	22 31 46.65N	114 13 27.06E
HH806	22 28 18.61N	114 14 58.76E
RUNSU	22 25 22.96N	114 11 53.57E
VH505 (FAF)	22 24 24.16N	114 08 49.88E
RW25R (THR)	22 19 54.45N	113 54 50.24E
VH522	22 19 17.08N	113 52 54.28E
VH523	22 24 20.51N	113 53 58.89E
VH526	22 29 52.41N	114 08 27.15E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ICAO Asia Pacific Flight Procedure Programme (APAC FPP)

Thank You