Tentative Agenda

	9:00-10:30 (90mins)	10:45-12:00 (90mins)	Lunch	13:20-14:50 (90mins)	15:00-16:30 (90mins)
Day1 Monday	Registration & Introduction	Review of Pre-course Assignment		General Overview -Aircraft Classification -MOC	Speed Conversion* & Turn Calculation*
Day2 Tuesday	Wind Effect & Turn Parameters	Wind Effect* & Turn Parameters*		Fix Tolerance	Fix Tolerance
Day3 Wednesday	NPA -General Criteria Initial Segment	NPA Initial Segment*		NPA Intermediate Segment	NPA Intermediate Segment*
Day4 Thursday	NPA Final Segment	NPA Final Segment* OCA/H*		NPA Final Segment* OCA/H* NPA VSS	NPA Final Segment* OCA/H* NPA VSS
Day5 Friday	Missed Approach -Initial Phase	Missed Approach -Intermediate Phase -Turning MAP		Missed Approach -Intermediate Phase -Turning MAP	Missed Approach -Intermediate Phase* -Turning MAP

Notes:

1. All scheduling is in Beijing time(UTC+8).
2. Topics with * will be followed by a short practical exercise.
3. Each presentation is followed by a 10-minute Q&A session.

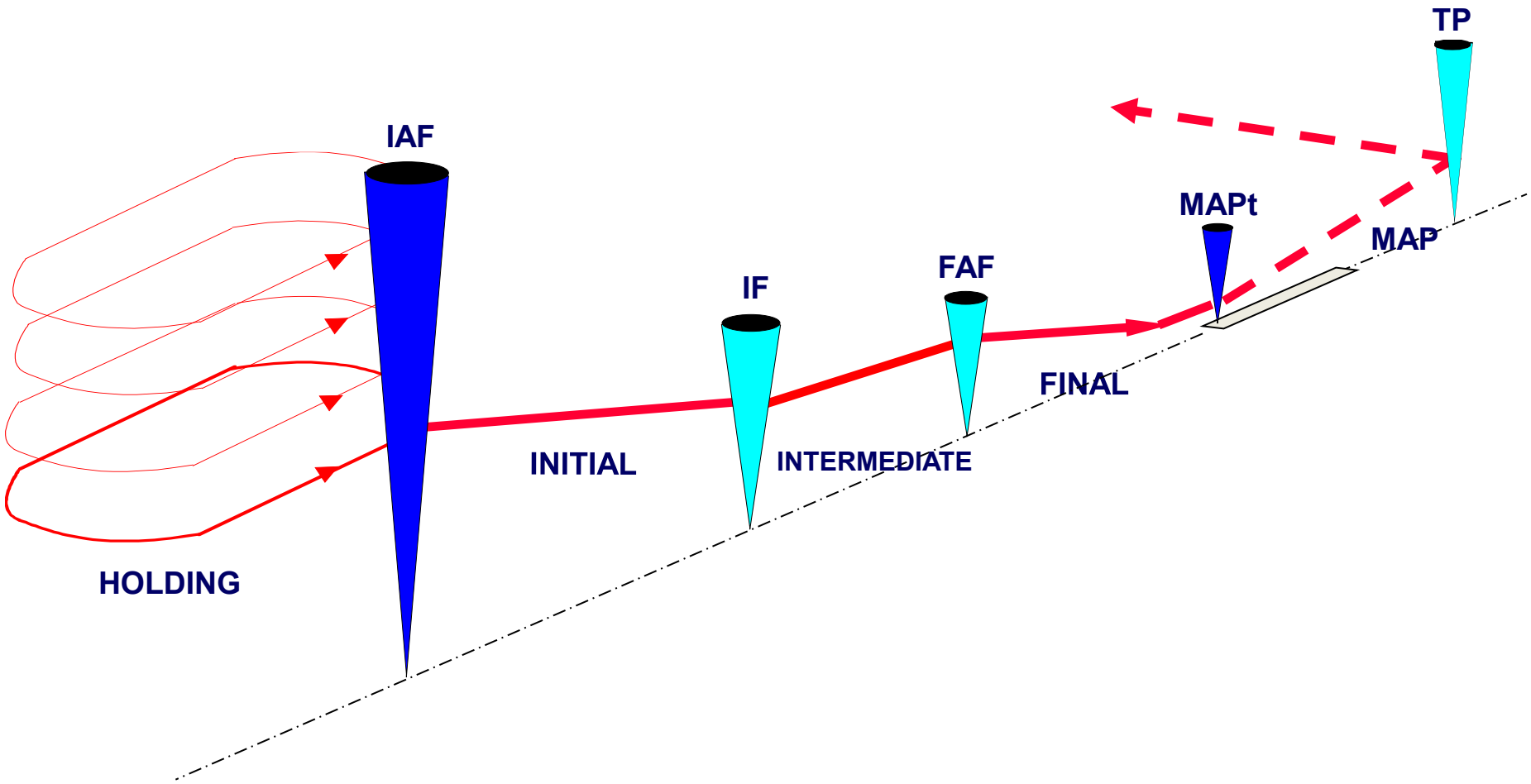
Pans-Ops
Procedure Design Initial Course

ICAO APAC FPP Office – Beijing, China

(15 June ~ 10 July 2026)

NPA INITIAL SEGMENT

REVIEW



REVIEW

- **An Instrument Approach Procedure may consist of 5 segments:**
  - **Arrival Segment**
  - **Initial Segment**
  - **Intermediate Segment**
  - **Final Segment**
  - **Missed Approach Segment**

PURPOSE

- The aircraft is able to manoeuvre to enter the Intermediate Segment
- It is not mandatory to have the Initial Segment in an Instrument Approach Procedure

INITIAL SEGMENT TRAJECTORIES

- **Guided Track:**
  - **Straight** 
  - **Curve**
- **Reversal & Racetrack**
  - **For Turn at IF ≥ 120°**
- **Dead Reckoning (DR)**

CONTENTS

- Segment is defined by 5 Parameters:
  - Alignment
  - Length
  - Descent Gradient
  - Area Width (Semi-width)
  - Minimum Obstacle Clearance (MOC)

ALIGNMENT & LENGTH

- Maximum turn at IAF: 120° (Recommended ≤70°)
- Maximum turn within Initial Segment: 120°

- No standard length
- The length shall be sufficient to permit altitude change required by the procedure
- 10NM is normally good for the Initial Segment

CONTENTS

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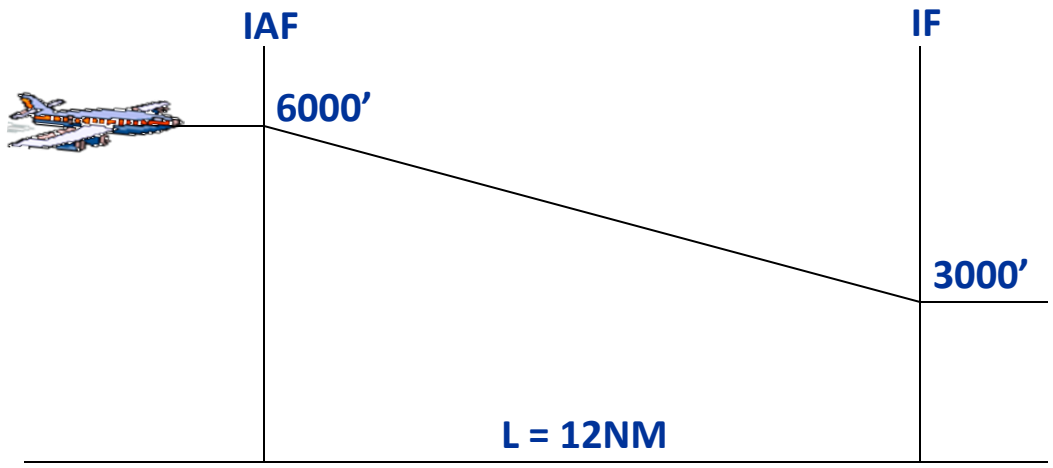
DESCENT GRADIENT

- Gradient = $\frac{\text{Vertical Change}}{\text{Horizontal Change}}$ = $\frac{\text{Rise}}{\text{Run}}$ Tangent
- Tangent * 100 = %
  - E.g. for a Standard GP, 3^{o} =
  - Gradient in ft/NM for 5.24% = 5.24% * =
- Maximum: 8%
- Optimum: 4%

DESCENT GRADIENT - EXERCISE

- **Descent Gradient = $\frac{\text{Change in Altitude}}{\text{Dist. between Nominal Fix Points}} = \frac{\triangle \text{ Alt}}{\text{L}}$**

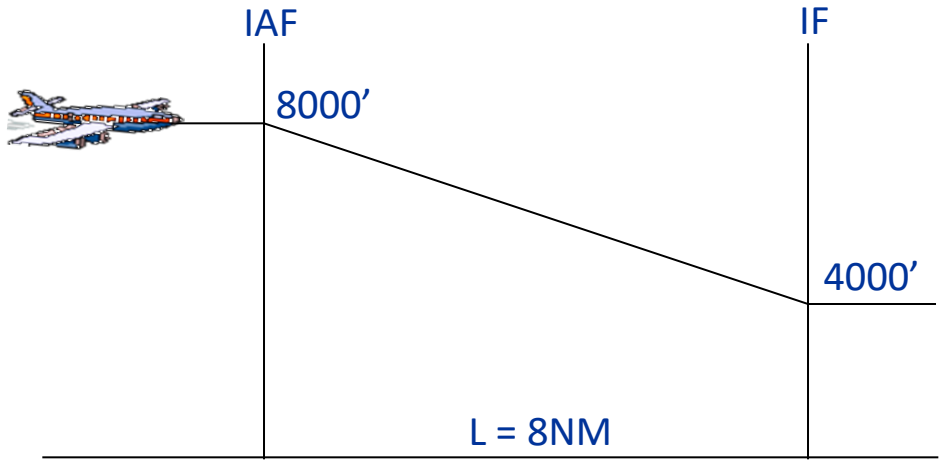
- **Exercise 1:**



- **Descent Gradient = =**

DESCENT GRADIENT - EXERCISE

- Exercise 2:



Gradient =

- How to optimize?

1. Move IAF:

$$L = \frac{\triangle \text{ Alt}}{\text{Gradient}} = \frac{4000'}{\quad}$$

2. Increase IF Altitude:

$\triangle$ Alt = L*Gradient = 8*4%*6076 = 1944’

CONTENTS

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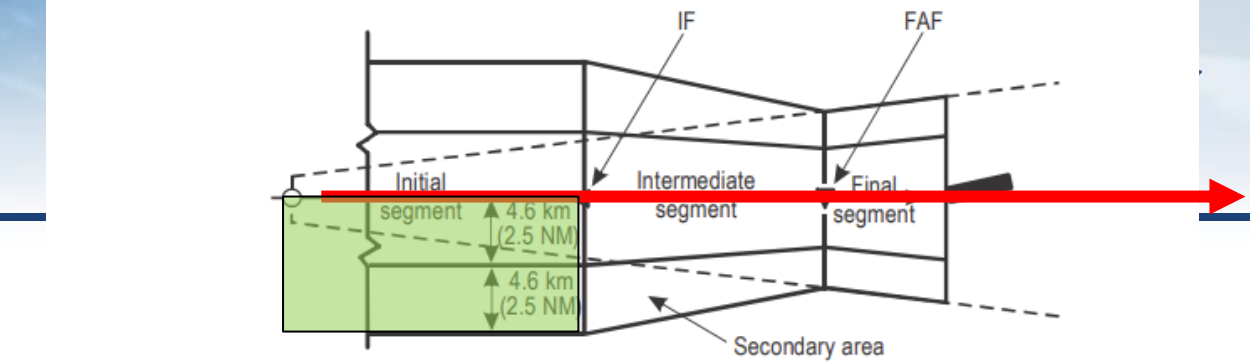
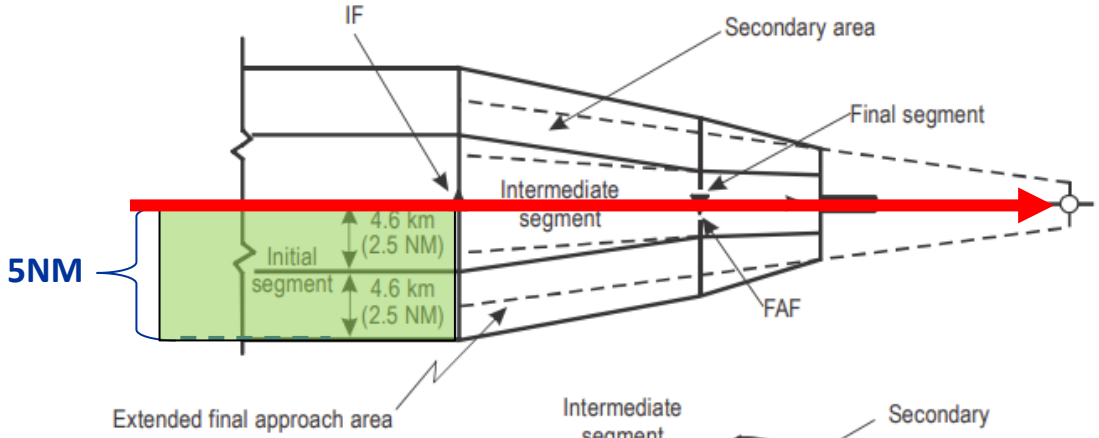
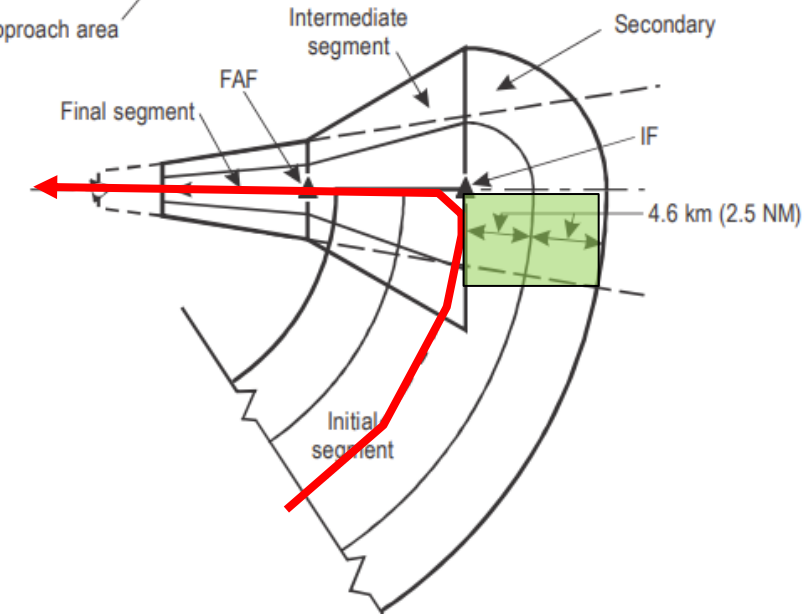
AREA WIDTH

- Semi-width (W/2) = **5NM**

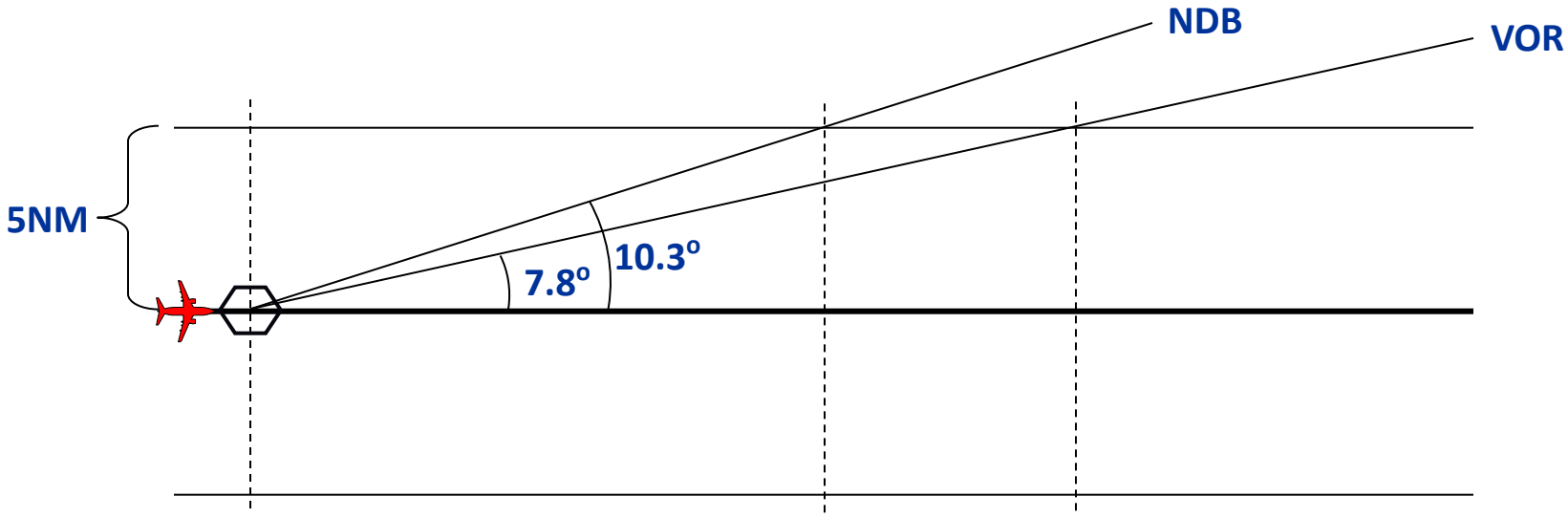




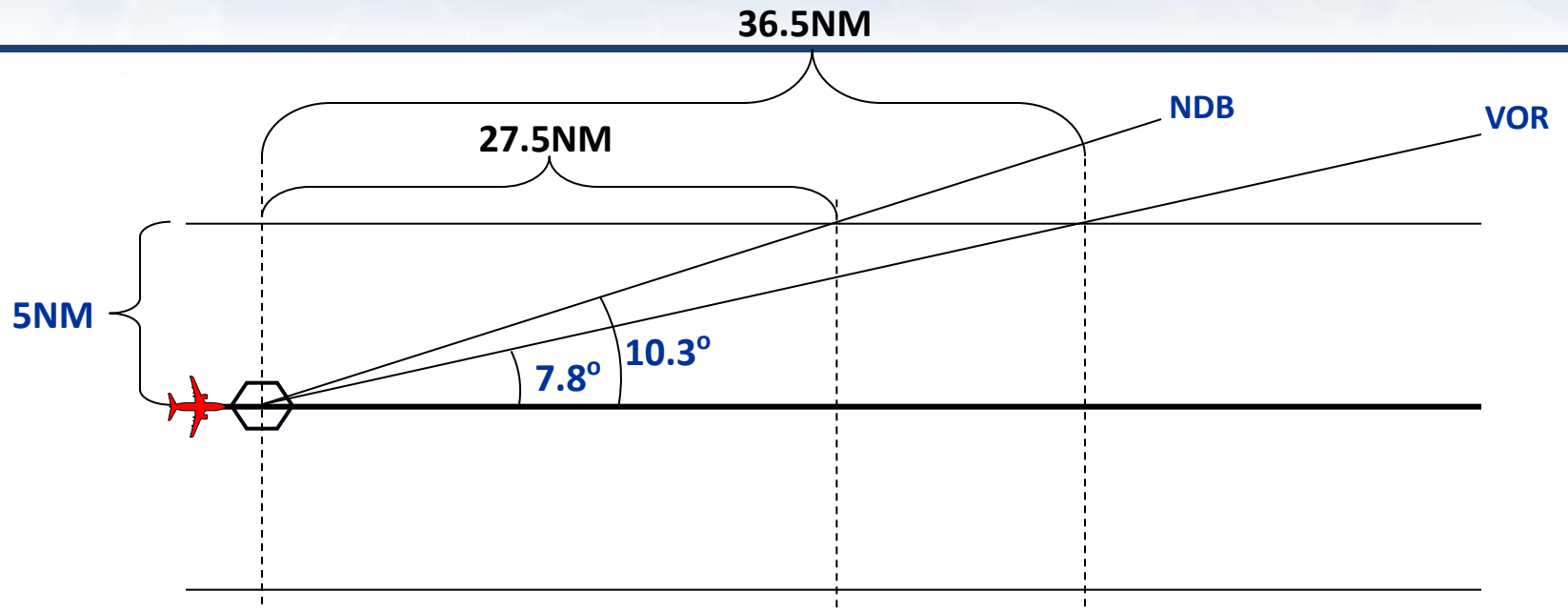


AREA WIDTH

- Semi-width (W/2) = 5NM
- For a guided track (with long segment):
  - VOR: 7.8°
  - NDB: 10.3°



AREA WIDTH



$$\text{Dist (VOR)} = \frac{5}{\text{Tan}7.8^{o}} = 36.5\text{NM}$$

$$\text{Dist (NDB)} = \frac{5}{\text{Tan}10.3^{o}} = 27.5\text{NM}$$

- Semi-width is divided equally into Primary & Secondary Areas
- Figure I-4-3-3 (P181)

AREA WIDTH

- For a particular distance from a facility, area semi-width is given by:
  - For VOR: $w/2 = D * \tan 7.8^{o}$
  - For NDB: $w/2 = D * \tan 10.3^{o}$

CONTENTS

- Segment is defined by 5 Parameters:
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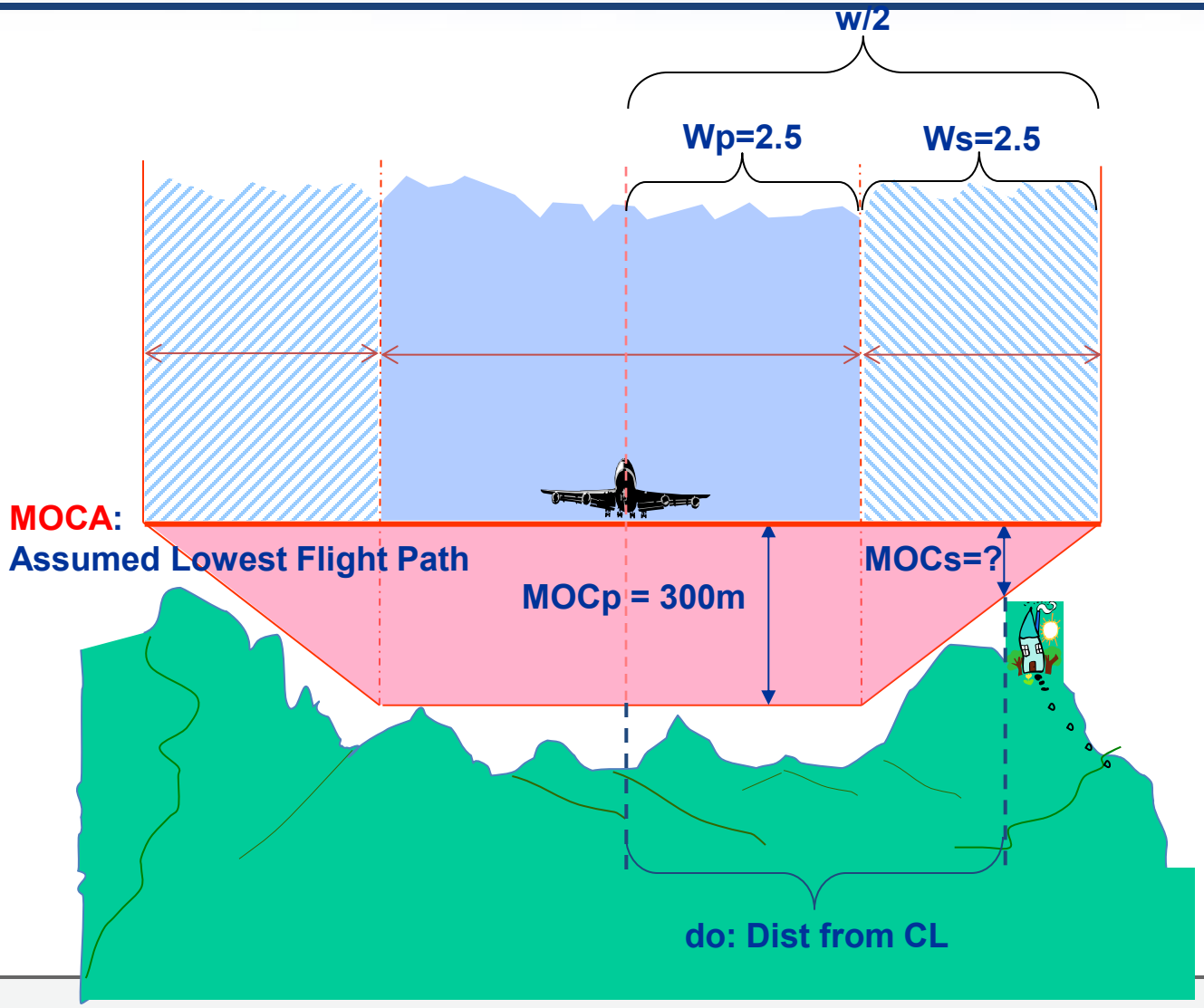
  - Minimum Obstacle Clearance (MOC)

MOC

- MOC: 300m/984ft
- Altitudes are assigned in increments of 100ft or 50m
- Altitude must provide at least 300m (984ft) clearance over all obstacles.
- The area (semi-width) is divided into half, the inner half is Primary and the outer half is Secondary
  - Primary: Full MOC is applied
  - Secondary: The MOC is reduced from full MOC at the inner boundary to zero at the outer boundary

MOC

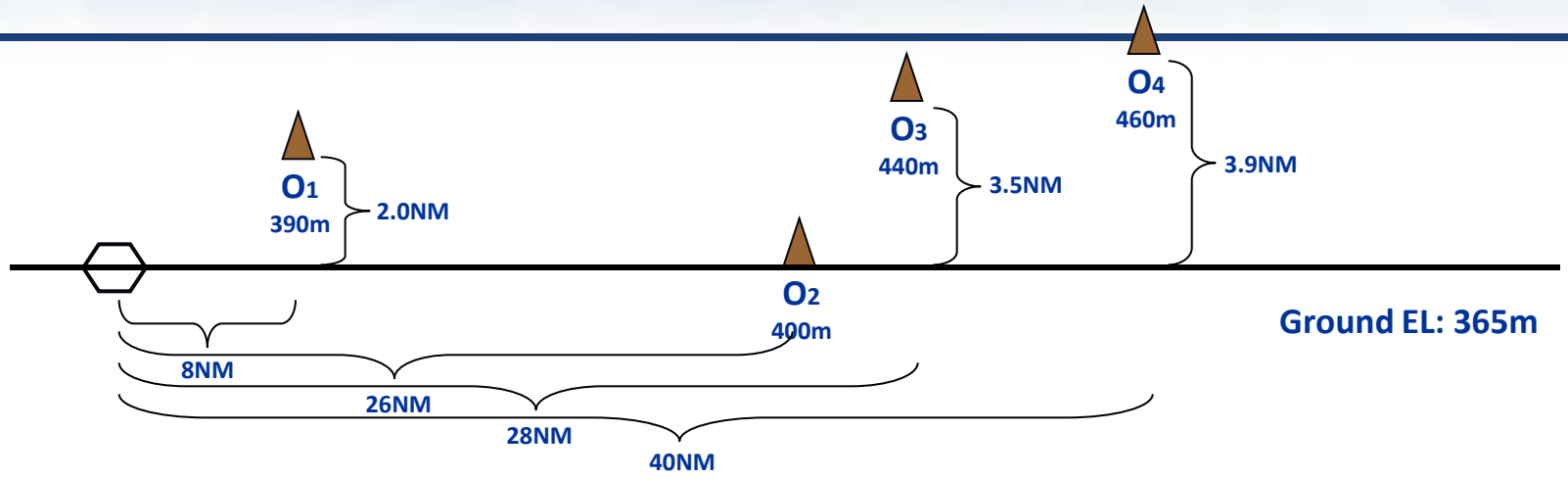


$$MOCs = \frac{w/2 - do}{Ws} MOCp$$

MOCA = GND EL + Ho + MOC

(with increment of 100ft or 50m)
Round up!!!

MOC - EXERCISE



- For each obstacle, calculate MOC and MOCA:

Critical Obstacle?

MOC	MOCA
O_1:	O_1:
O_2:	O_2:
O_3:	O_3:
	O_4:
O_4:	MOCA in this segment:
	MOCA (in ft):

INITIAL SEGMENT TRAJECTORIES

- **Guided Track:**
  - **Straight**
  - **Curve** 
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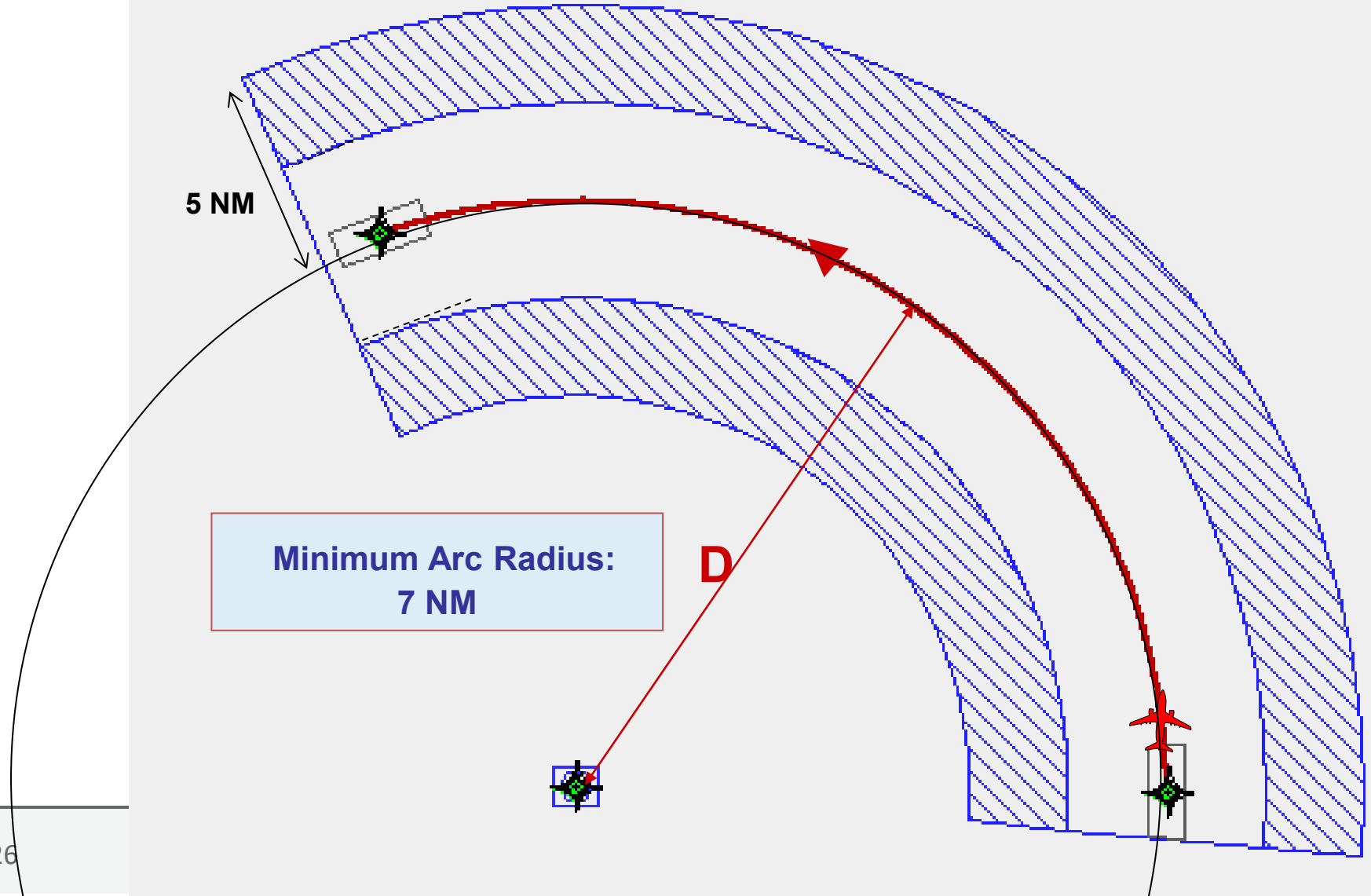
DME ARC




Any
Penetration???

Let's Focus/Propose/Plan Together