



NPA INTERMEDIATE SEGMENT



APAC FPP, ICAO

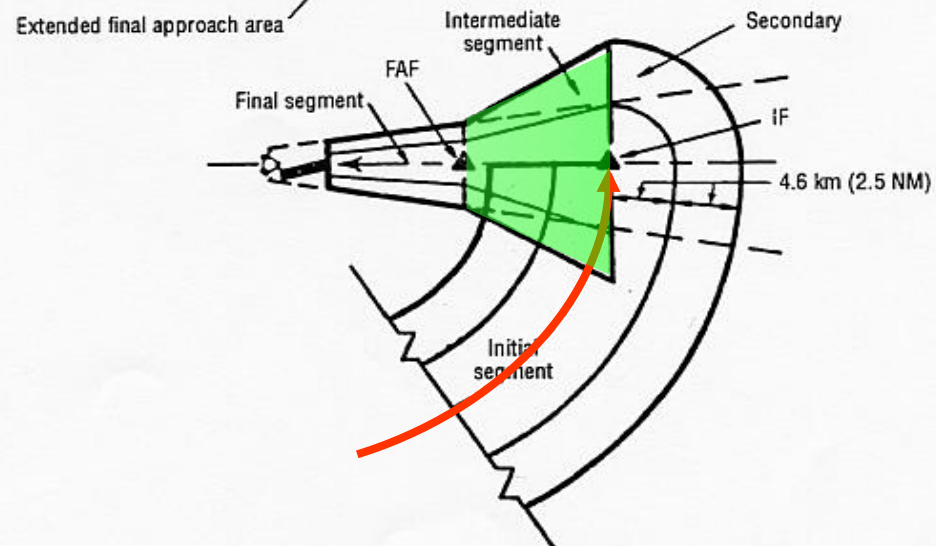
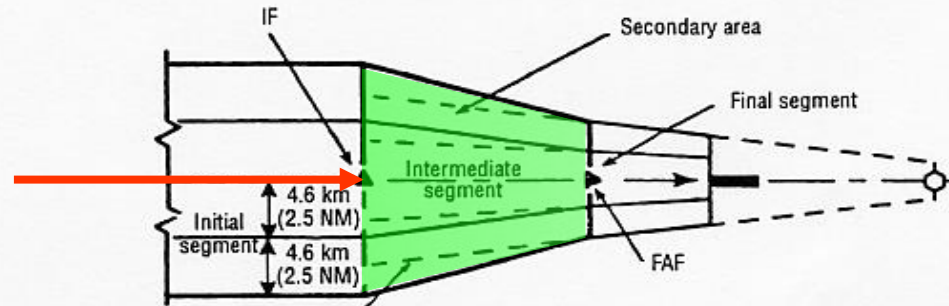
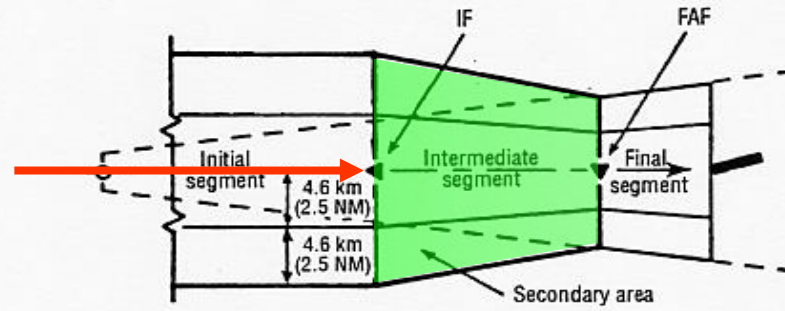
PURPOSE

- ◆ To connect the Initial to the Final
- ◆ To provide a **level segment** within which the aircraft can be prepared for the final descent (aircraft configuration, speed, etc.)
- ◆ **Track guidance** shall be provided

OVERVIEW



➤ Examples...



◆ 5 Parameters:

- ◆ Alignment

- ◆ Length

- ◆ Descent Gradient

- ◆ Area Width (Semi-width)

- ◆ Minimum Obstacle Clearance (MOC)

ALIGNMENT & LENGTH

- Maximum turn at IF: **120°** (Recommended **≤70°**)
- If more than 120°, then Reversal

- Length:
 - Minimum: **5NM**
 - Optimum: **10NM**
 - Maximum: **15NM**
- Minimum Length will be increased for a turn great than 90° at IF

Interception Angle	Minimum Length
91-96	6 NM
97-102	7 NM
103-108	8 NM
109-114	9 NM
115-120	10 NM

- ◆ **5 Parameters:**
 - ◆ **Alignment**
 - ◆ **Length**
 - ◆ **Descent Gradient**
 - ◆ **Area Width (Semi-width)**
 - ◆ **Minimum Obstacle Clearance (MOC)**

DESCENT GRADIENT

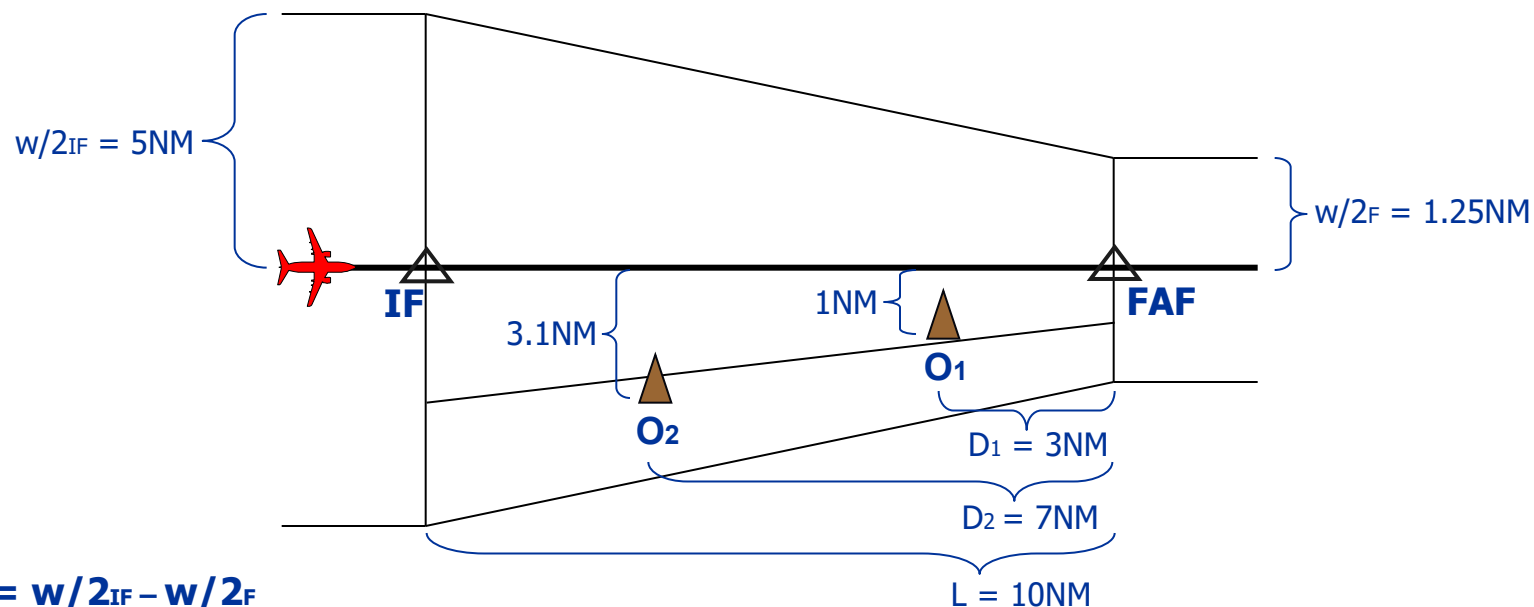
- **Optimum: Flat (i.e. 0%)**
- **Maximum: 5.2%**
- If descent is necessary, a horizontal segment with a minimum length of **1.5NM** should be provided prior to the final approach for CAT C & D aircraft
- **1NM** for CAT A & B

- ◆ **5 Parameters:**
 - ◆ **Alignment**
 - ◆ **Length**
 - ◆ **Descent Gradient**
 - ◆ **Area Width (Semi-width)**
 - ◆ **Minimum Obstacle Clearance (MOC)**

AREA WIDTH

- Join the boundary of the **Initial at IF** to the boundary of the **Final at the FAF**

➤ E.g.



$$\text{Expansion} = w/2_{IF} - w/2_F$$

$$\begin{aligned} w/2(O_1) &= w/2_F + D_1/L(w/2_{IF} - w/2_F) \quad (\uparrow) \\ &= 1.25 + 3/10(5 - 1.25) \\ &= 2.375\text{NM} \\ &\therefore O_1 \text{ is in PRI} \end{aligned}$$

$$\begin{aligned} w/2(O_2) &= 3.875\text{NM} \\ &\therefore O_2 \text{ is in SEC} \end{aligned}$$

- ◆ **5 Parameters:**
 - ◆ **Alignment**
 - ◆ **Length**
 - ◆ **Descent Gradient**
 - ◆ **Area Width (Semi-width)**
 - ◆ **Minimum Obstacle Clearance (MOC)**

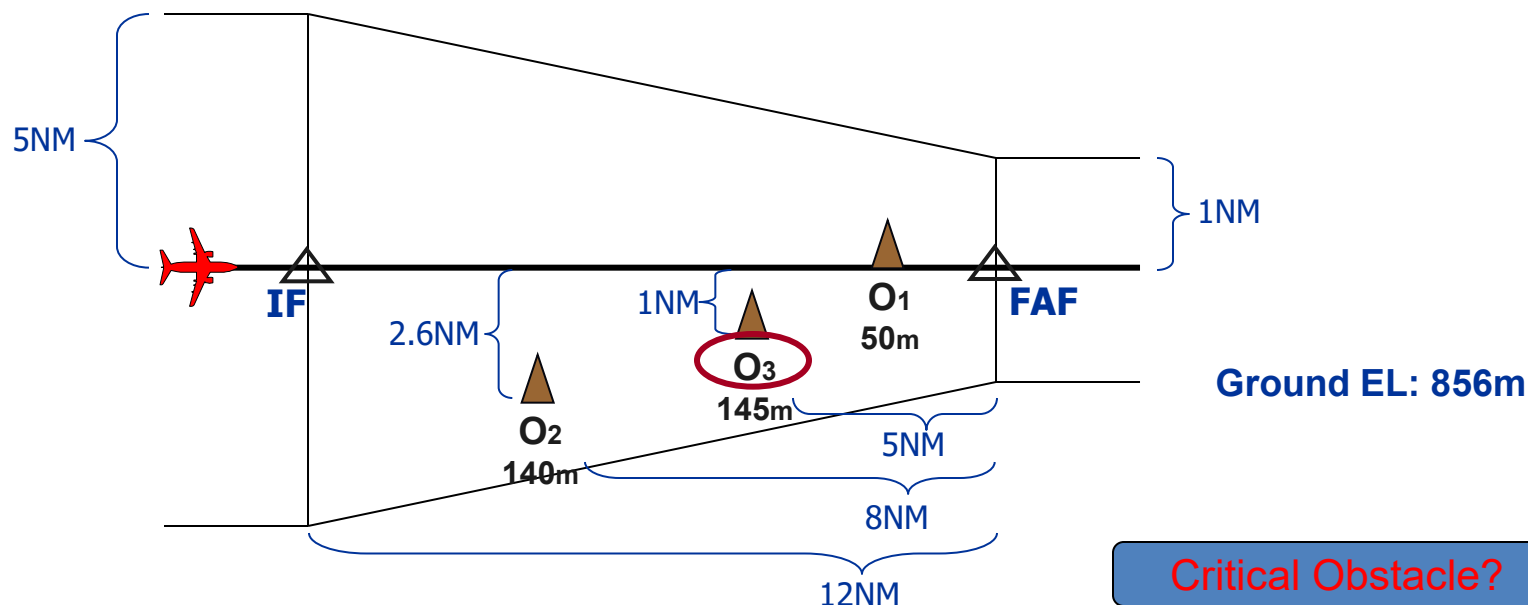
MOC



- **MOC: 150m/492ft**
- **Altitudes are assigned in increment of 100ft or 50m**
- **Altitude must provide at least 150m (492ft) 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 - EXERCISE

➤ Calculate MOCA (in m & ft) for O₁, O₂ & O₃:



$$O_1: 856 + 50 + 150 = 1056\text{m} \rightarrow \mathbf{1100\text{m}}$$

$$3465' \rightarrow \mathbf{3500'}$$

$$O_2: w/2(O_2) = 1 + 8/12(5-1) = 3.67 (\uparrow, \text{SEC})$$

$$\text{MOCs} = \frac{3.67 - 2.6}{3.67/2} 150\text{m} = 88\text{m} (\uparrow)$$

$$\therefore 856 + 140 + 88 = 1084\text{m} \rightarrow \mathbf{1100\text{m}}$$

$$3557' \rightarrow \mathbf{3600'}$$

$$O_3: w/2(O_3) = 1 + 5/12(5-1) = 2.67 (\uparrow, \text{PRI})$$

$$\therefore 856 + 145 + 150 = 1151\text{m} \rightarrow \mathbf{1200\text{m}}$$

$$3777' \rightarrow \mathbf{3800'}$$

Critical Obstacle?

