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PANS-OPS Flight Procedure Design Training for CAAs

23 August – 03 September 2021

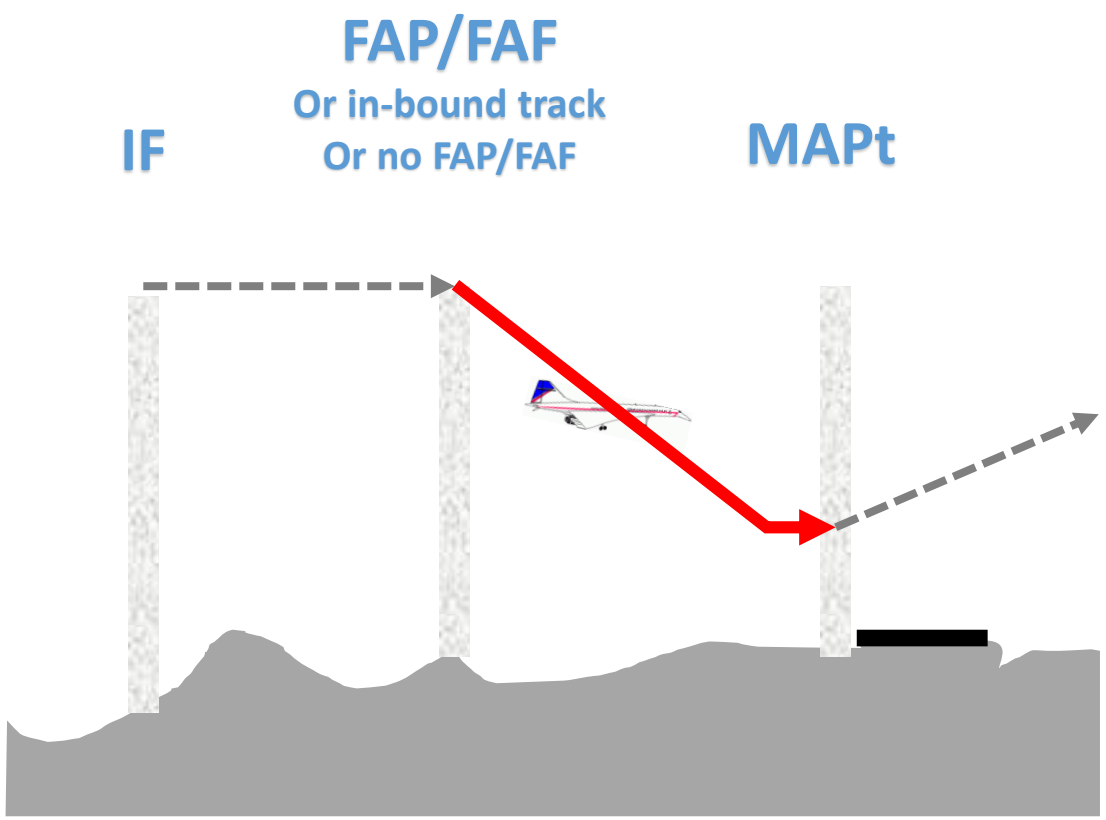
08 – Intermediate approach segment

(Doc. 8168, Vol. 2, Part I, section 4, Chap. 5)

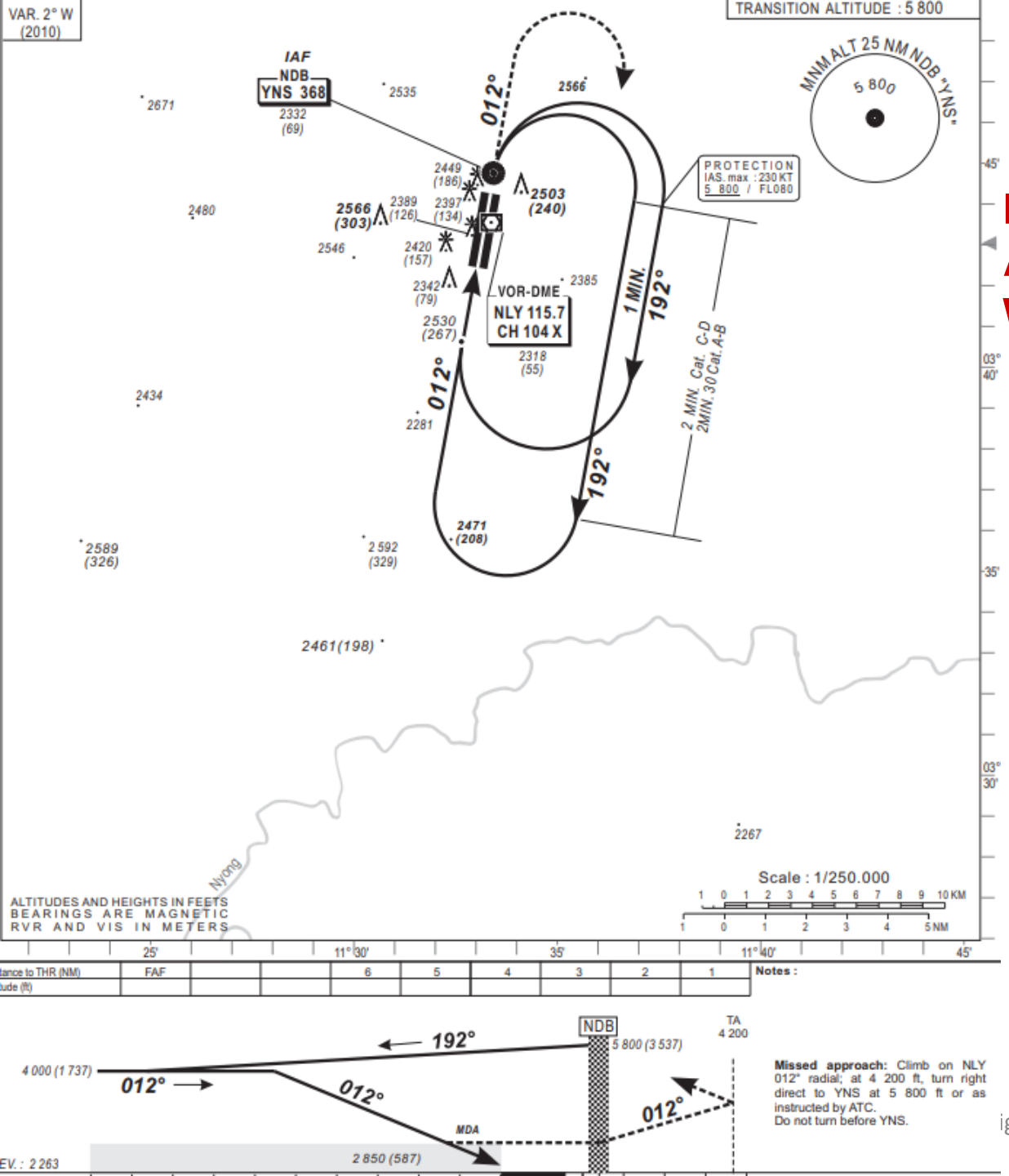
Outlines

1. General
2. Alignment criteria
3. Location of the facility
4. Length of final approach segment
5. Vertical profile
6. Protection

General



- Goal: Perform safe approach and landing;
- Track guidance provided;
- Final approach made to:
  - A runway: straight-in approach;
  - An aerodrome: Circling approach.
- Mandatory segment!
- May not have FAP/FAF: Not recommended!



FACILITY ON AERODROME WITHOUT DME

Reversal Racetrack

Final without FAF

FACILITY ON AERODROME WITH DME OR **FACILITY OUT OF AERODROME**

Final with FAF

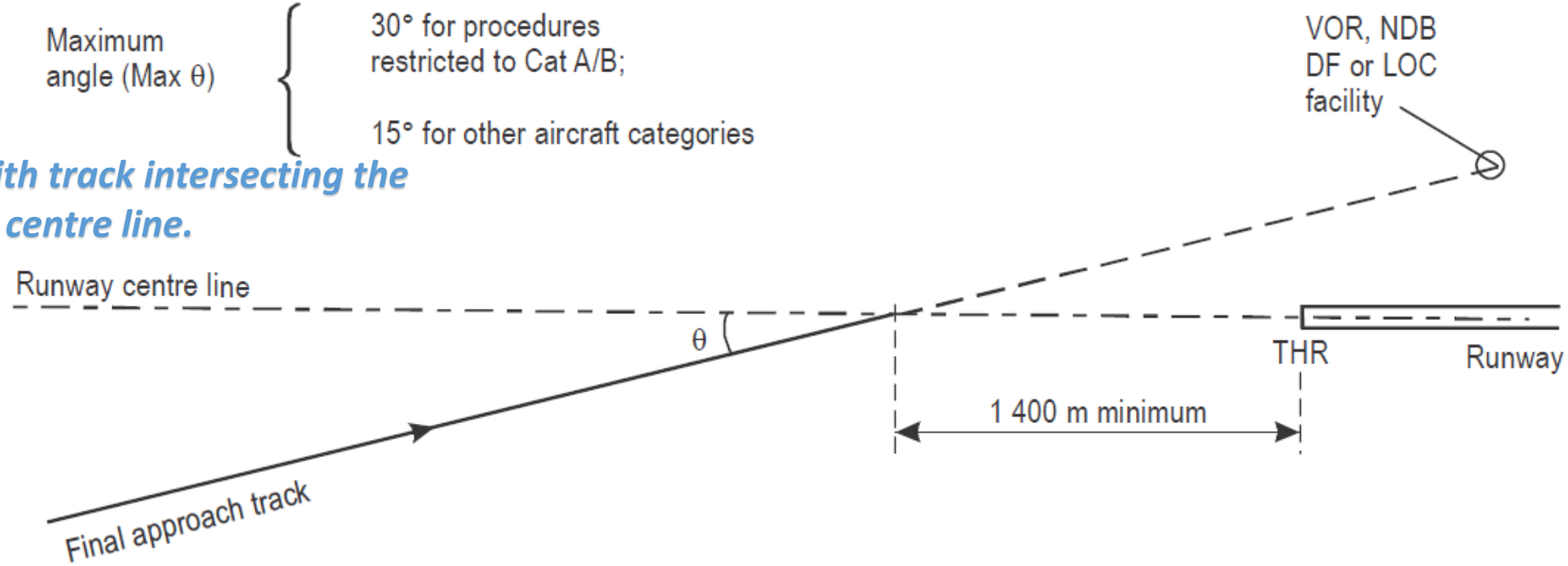
Alignment criteria

- Optimum: Aligned with runway centerline
- Offset final approach track accepted:
  - ☞ Offset angle ≤ 5° :
    - No OCH penalty;
  - ☞ Maximum offset angle (Additional acceptability conditions):
    - 15° : Cat. C and D;
    - 30° : Cat. A and B.
- Compliant with the alignment criteria?
  - ☞ Yes: Straight-in approach
  - ☞ No: Circling approach.

Maximum angle (Max θ)

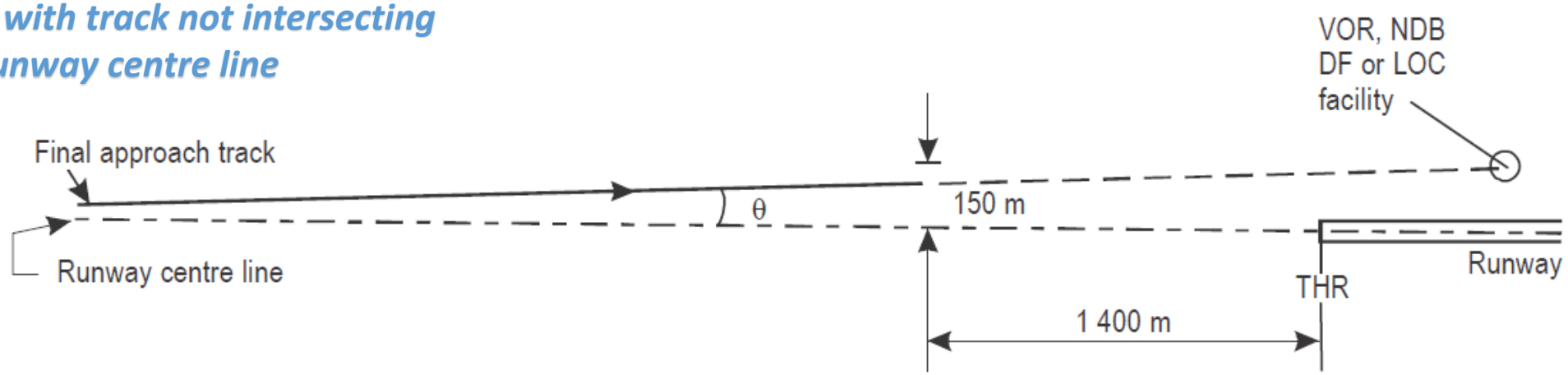
- 30° for procedures restricted to Cat A/B;
- 15° for other aircraft categories

Final approach with track intersecting the extended runway centre line.

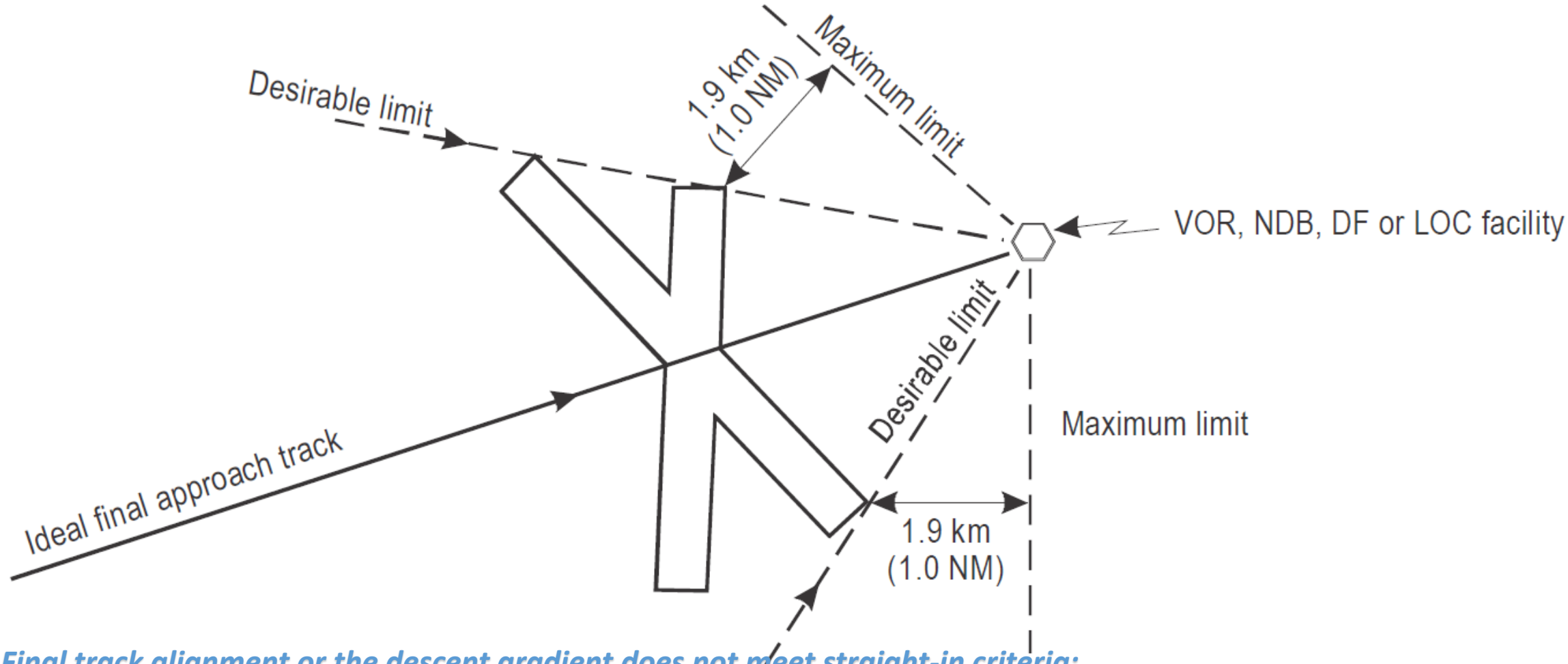


(θ more than 5°)

Final approach with track not intersecting the extended runway centre line



(θ equal to or less than 5°)

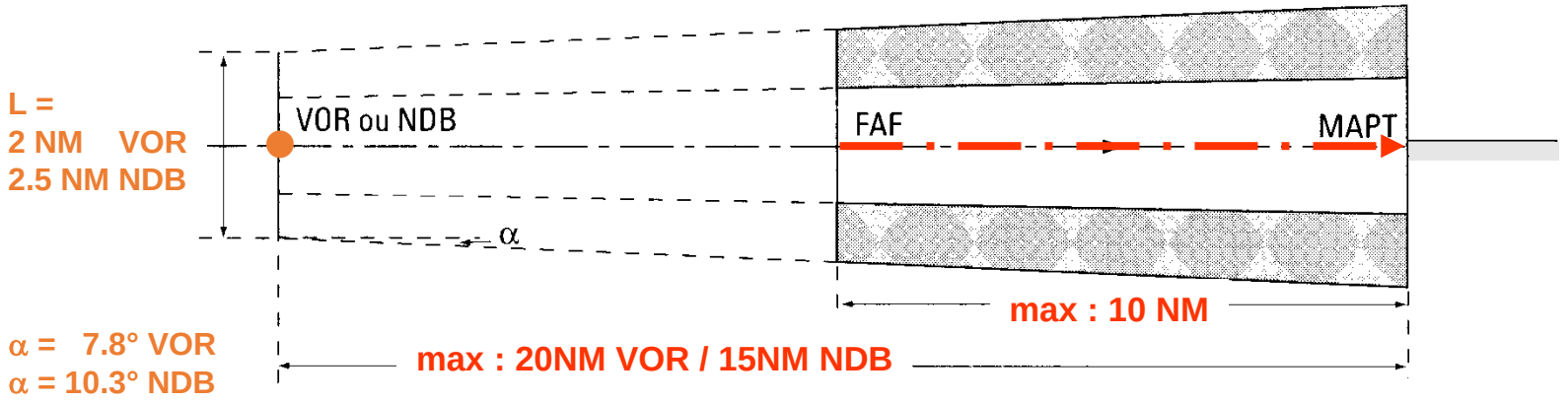


Final track alignment or the descent gradient does not meet straight-in criteria:

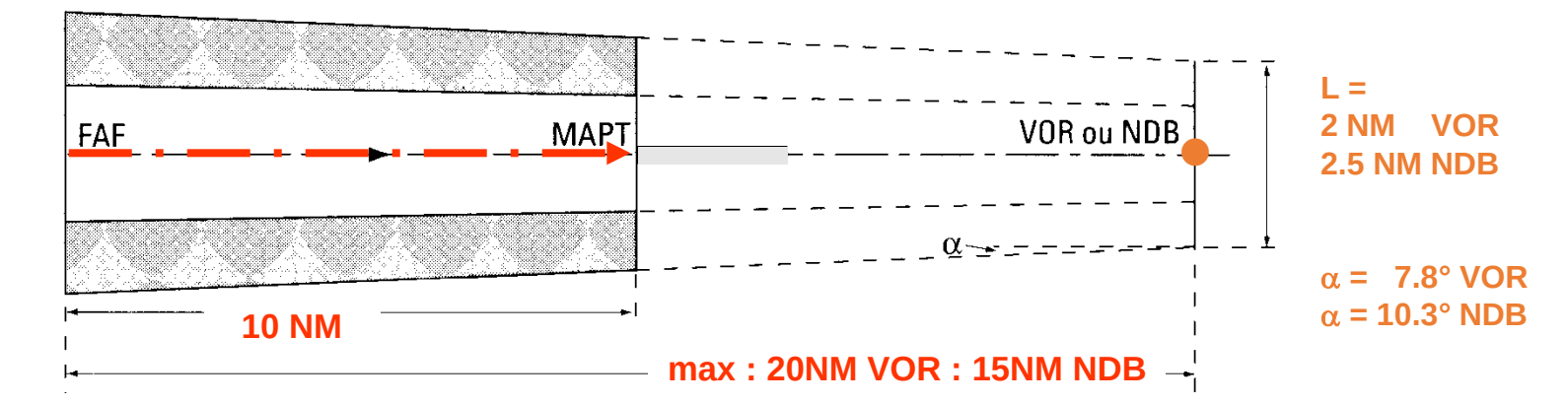
- ***Circling approach: the track alignment should ideally be made to the centre of the landing area.***
- **Exceptional cases, it may be aligned beyond the aerodrome boundary, but in no case beyond 1.0 NM from the usable landing surface**

Figure I-4-5-2. Final circling approach alignment

Location of the facilities (VOR, VOR-DME, NDB)



Final from facility



Final to facility

Length of final approach segment

- Standard length of the final approach:
  - Minimum : 3 NM;
  - **Optimum : 5 NM;**
  - Maximum : 10 NM.
- Minimum length if turn over the FAF :

	Magnitude of the turn over FAF			
Aircraft category	10° or less	20°	30°	60°
D, DL	3.0	3.0	3.5	-
E	3.0	3.5	4.0	-
H	1.0	1.5	2.0	3.0

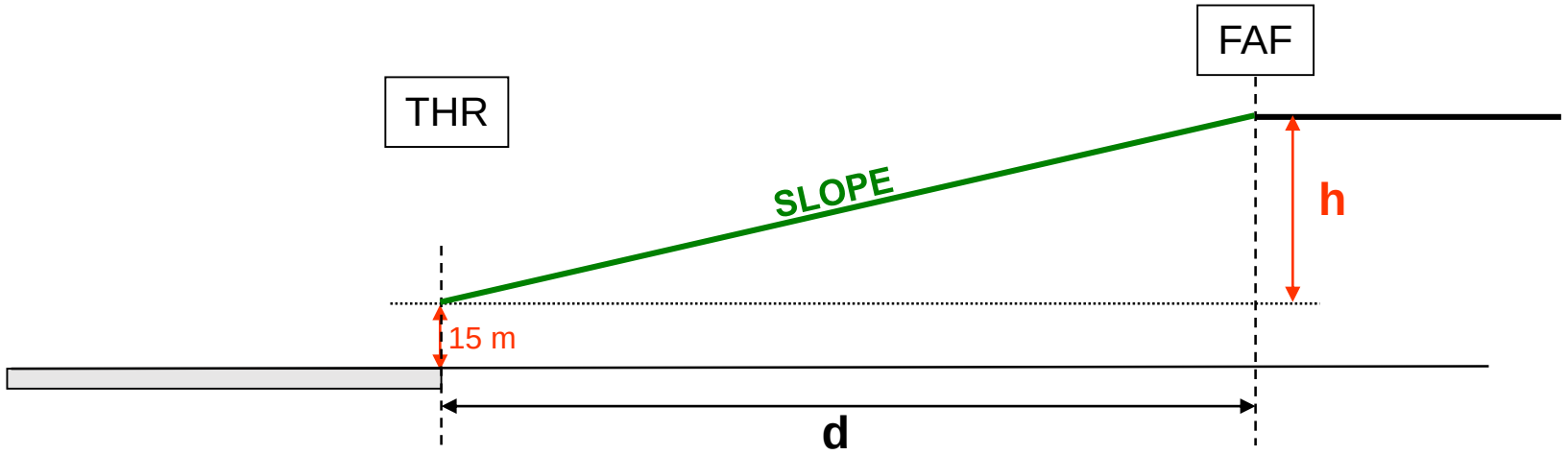
Vertical profile

- Vertical management: Slope or rate of descent
- Criteria for slopes:
  - Minimum and optimum: 5.2%;
  - Maximum:
    - 6.5° Cat. A and B;
    - 6.5° Cat. C and D;
    - Specific values for vertically guided approaches.

Aircraft Category	Rate of descent (ft/min)	
	Minimum	Maximum
A &B	394	655
C, D & E	590	1 000

Slope computation

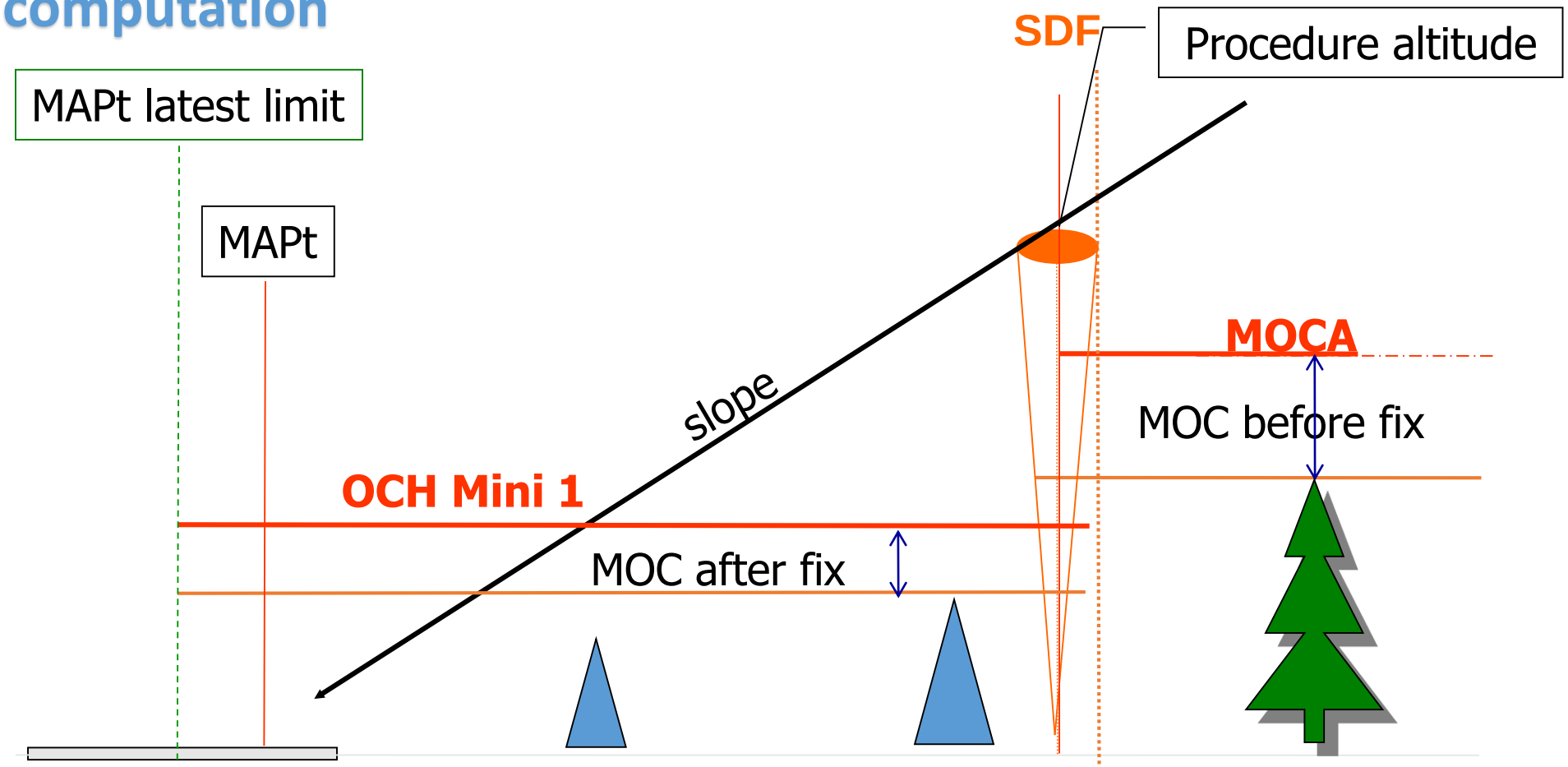
$$\text{Slope} = \frac{h}{d}$$



Protection

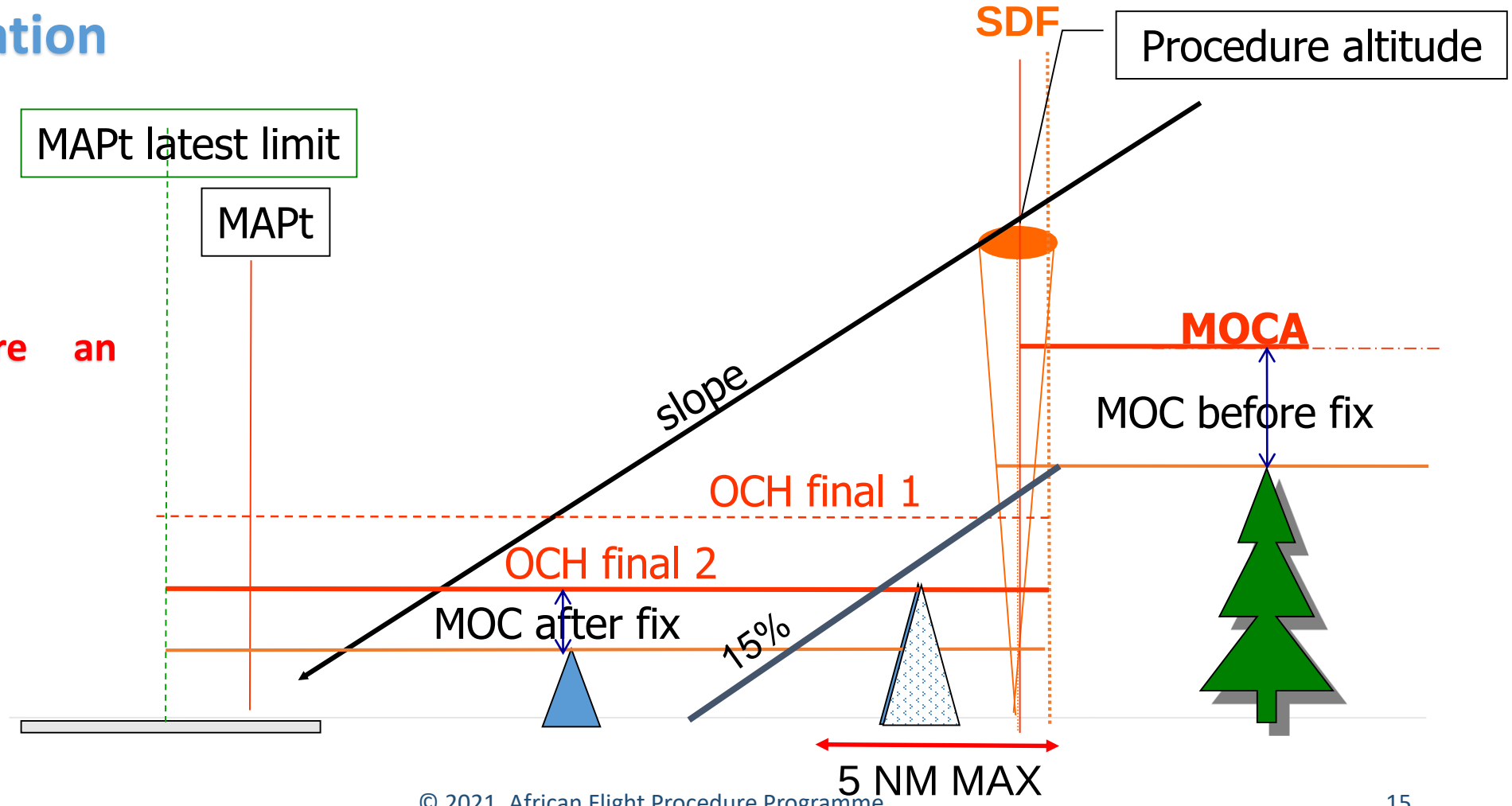
- MOC:
  - 75 m if FAF;
  - 90 m if no FAF;
  - Secondary area criteria apply;
  - If SDF:
    - 75 m between SDF and MAPt;
    - 90 m before the SDF.
- Recall:
  - OCA = Max(altitude obstacle + vegetation + MOC)

SDF computation



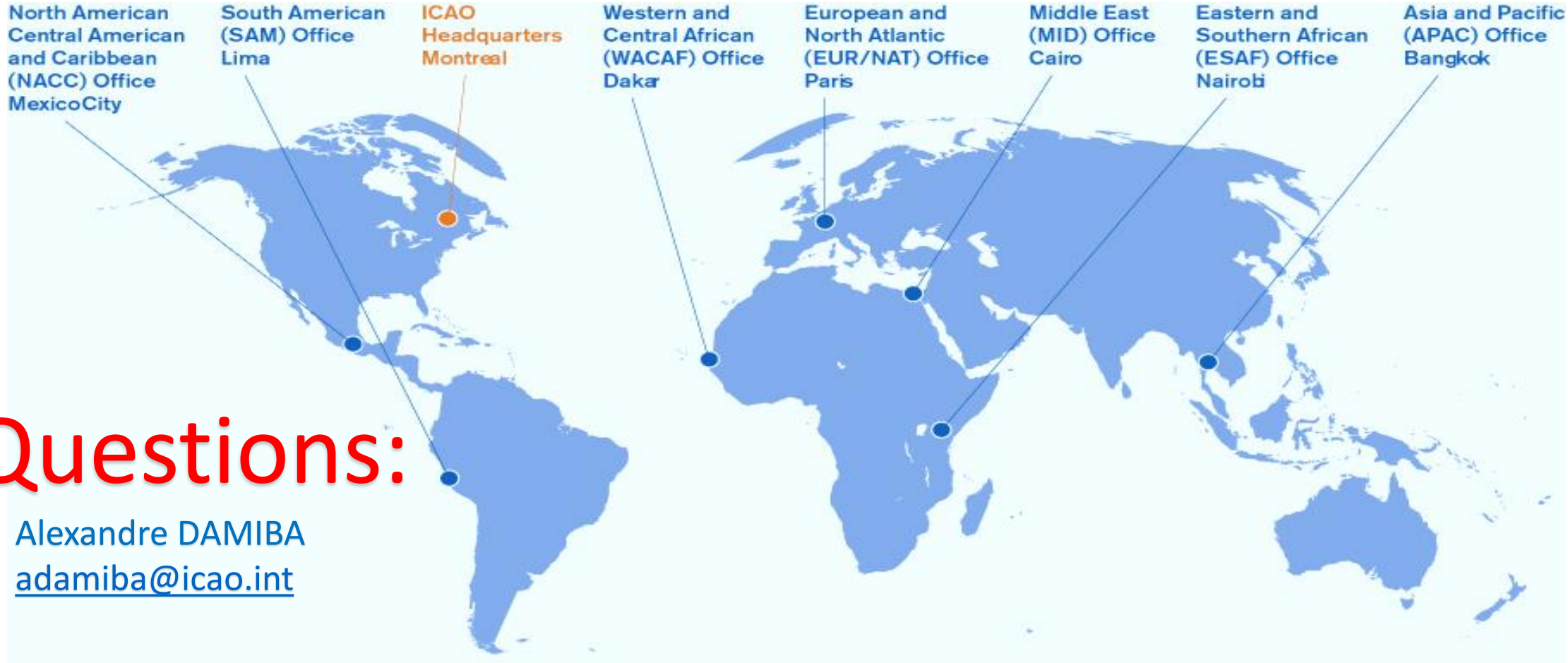
SDF computation

SDF used to ignore an obstacle



Summary

- General:
  - Track guidance, types of final approach)
- Alignment criteria:
- Location of the facilities
- Length:
  - Standard case;
  - Additional cases (offset, steep angles).
- Vertical profile: MOC, slope, rate of descent.
- Protection



Questions:

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