Federal Aviation Administration

20:1 Approach Penetrations and Loss of Night Minimums

Presented to: AGL State Aviation Directors

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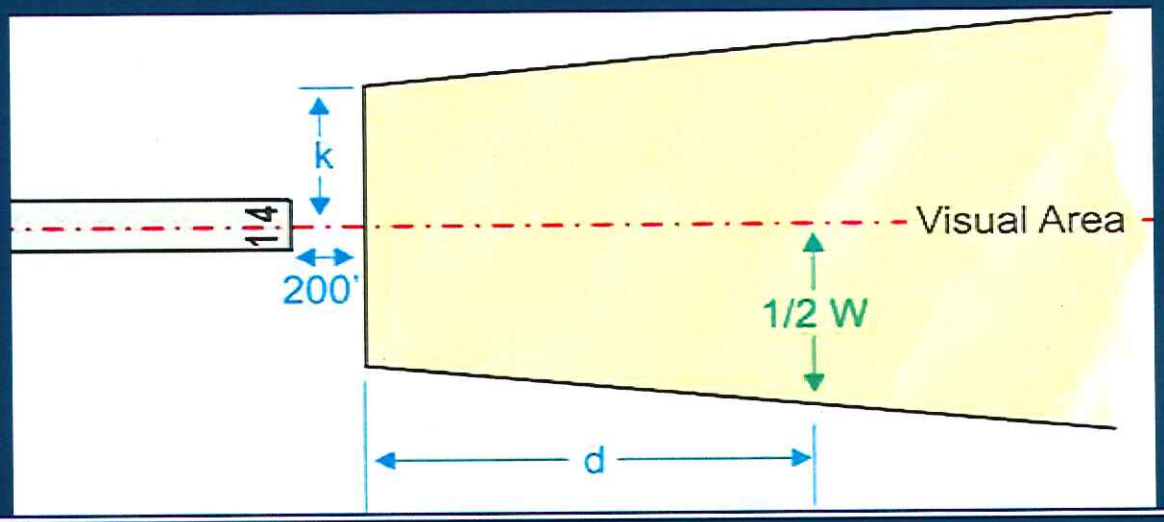
Guidance:

1. 14 CFR Part 77

2. Terminal Instrument Procedures (TERPS) 8260.3/8260.19

Figure 3-3b. Straight-in Visual Area

- **Formula 3-3b. Straight-in Visual Area 1/2 width**
- ½W=(0.138× d)+k
- *where 1/2W = perpendicular distance (feet) RCL to area edge*
- *d = distance (feet) from origin measured along RCL*
- *k = 200 for Cat A/B, 400 for Cat C/D/E*



20:1 Approach Penetrations

- All visual surfaces are evaluated during design phase for new and amended procedures by the FPT.
- Published procedures are reviewed every two years by AeroNav Products, as required by AFS policy.
- During that review, new obstacles are routinely identified that penetrate the 20:1 visual surface.
  - New surveys
  - On/Off airport construction adds obstacles to the database
  - Flight check observed obstacles

20:1 Penetrations (continued)

- Keeping the 20:1 surface clear is the responsibility of the airport authority/sponsor.

- If penetrations exist the following action is required.
  - Chart the procedure: **"NA at NIGHT"**.
  - Limit published visibility to 1 mile
    - Allowable Mitigations IAW 8260.3 and 8260.19
      - Remove identified obstacle (recommended)
      - Visual aids (VGSI) such as VASI or PAPI
      - Mark/Light the obstacle

- Obstacle is below PART 77 Approach Surface (no action required)
- Obstacle penetrates to 34:1 Surface, Minimums Increased and limit visibility to ¾ mile
- Obstacle penetrates to 20:1 Surface, Night Minimums NA and limit visibility to 1 mile

20:1 Penetrations (continued)

- When notified by AeroNav Products of runways with 20:1 penetrations, the FPT immediately notifies the Airport Manager.
- **Action for Airport to take once notified:**
  - Clear the 20:1 penetrations, if possible.
  - Light the 20:1 penetrations, if possible.
    - If obstacle clearing has occurred, provide updated data to the FPT.
  - Is there a plan to remove/reduce in height/light the unlit penetration(s) and, if so, what is the timeline?
  - If the unlit penetration(s) cannot be removed, reduced in height, or lighted, a properly sited, **certified** and **maintained** VGSI could be used to mitigate the effects of the unlit obstacles, if approved by FAA Flight Standards Division, AFS-400.
    - FPT will send and official notification letter, along with a VGSI Mitigation request form to the airport manager (if requested) which must be completed and returned. FPT will then forward response for mitigation consideration

VGSI Mitigation

- If a VASI or PAPI exists on the runway, determine the owner of the VASI or PAPI
- VGSI equipment must meet siting standards IAW FAA JO 6850.2B
- The owner of the visual aid (VGSI) must ensure that a commissioning flight inspection was performed and meets the current tolerance IAW FAAO 8200.1B, Ch 7.
- The VGSI must be under a current Recurring Maintenance program IAW AC 150/5340-26B, para 5.7.
- The VGSI angles/TCHs must meet IFR operation requirements for the intended use of the applicable runway(s). (IAW FAAO 6850.2, AC 150/5300-13A and FAAO 8260.3)

Questions?

Thank you

Contacts

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- Or, the Flight Procedures Team specialist for identified location.

- **History:**
- **Previous TERPS criteria allowed 20:1 penetrations to be mitigated by raising the visibility minima to 1 statue mile**
  - May 20, 2002 criteria change to TERPS FAAO 8260.3b and the 8260.19c required 20:1 penetrations to be marked and/or lite.
  - VGSI was authorized to mitigate the 20:1 penetration to avoid "NA at Night" of the procedure.

- **Oct 7, 2003: Flight Standards (AFS) memo provided implementation relief by allowing a 3-year notification process. The 3-year relief period was partially based upon allowing time for the airport's to obtain funding for the clearing or lighting of 20:1 penetrations.**
  - The Flight Procedures Teams (FPT) were responsible for notifying the airports, via letters of the requirement to clear the airport's 20:1 surfaces.
  - Several notifications to the airports were issued and tracked by the FPT.

- **Oct 1, 2010: Flight Standards (AFS) memo issued to rescind the previous Oct 7, 2003 memo.**
  - Flight Standards grandfathered the original October 7, 2003 list of all airports in the 3-year notification process.
  - All other instrument flight procedures are required to use the current criteria.

- **March 2012: AFS revised FAA Order 8260.19E Change 2 to address unlit 20:1 penetrations.**
  - Requires that AeroNav Products NOTAM the procedure "NA at night" when penetrations are discovered during a periodic review or amendment process.
  - Requires that the Flight Procedures Teams coordinate with the airport for an AFS Approval Letter if the airport is unable to clear or light all of the penetrations.
  - Flight Standards Approval Letter will be dependent upon satisfactory Flight Inspection of the VGSI, and/or an airport tree clearing/maintenance plan.