CHANGE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

8260.3B
CHG 24

National Policy

Effective Date:
08/31/2011

SUBJ: United States Standard for Terminal Instrument Procedures (TERPS)

1. Purpose. Order 8260.3B, United States Standard for Terminal Instrument Procedures (TERPS), contains the criteria used to formulate, review, approve, and publish procedures for instrument flight operations to and from civil and military airports. The purpose of this change is to incorporate Notice 8260.68 and 8260.69 into the order.

2. Audience. The audience for this Order is the FAA organization responsible for instrument flight procedure (IFP) development. The secondary audience includes third party service providers, Air Traffic Organization (ATO) Service Area offices, Flight Standards headquarters and Regional office Divisions/Branches, and the applicable elements in the United States Army, Navy, Air Force, and Coast Guard (hereafter referred to as the U.S. Military or Military).

3. What this Order Cancels.

a. Notice 8260.68, Publication of Circling Minima on Vertically-Guided Instrument Approaches.

b. Notice 8260.69, Simultaneous Independent Parallel Instrument Approaches [SIPIA] – Widely Spaced Runways.

c. AFS-400 January 26, 2005 Memorandum, Standard for Decision Altitude (DA) Rounding Convention

4. Distribution. We will distribute this Order to Washington headquarters to the Group and Team level in the Air Traffic Organization (Safety, En Route and Oceanic Services, Terminal Services, System Operations Services, Technical Operations Services, and Mission Support Services), Offices of Airport Safety and Standards, and Offices of Air Traffic Oversight; to the branch level in Offices of Airport Safety and Standards; Flight Standards Service; to the Aeronautical Navigation Products Office (AeroNav Products, AJV-3), and to the Regulatory Standards Division (AMA-200), at the Mike Monroney Aeronautical Center; to the branch level in the regional Flight Standards and Airport Divisions; to all Flight Standards District Offices (FSDOs); to the Team level in the Air Traffic Organization Service Areas (En-Route and Oceanic, Terminal, and Technical Operations); special mailing list ZVN-826; and Special Military and Public Addressees.

PAGE CONTROL CHART

Remove Pages	Dated	Insert Pages	Dated
Table of Contents vii thru x	05/15/02	**Table of Contents** vii thru x	08/31/11
Volume 1, Chapter 3 **Section Two** 3-7 thru 3-13	12/07/07	**Volume 1, Chapter 3** **Section Two** 3-7 thru 3-13	08/31/11
Volume 1, Chapter 3 **Section Three** 3-14	08/17/11	**Volume 1, Chapter 3** **Section Three** 3-14	08/31/11
Volume 3, Appendix 2 1 thru 6	05/15/02	**Volume 3, Appendix 2** A2-1 thru A2-4	08/31/11

John M. Allen
Director, Flight Standards Service

TABLE OF CONTENTS

Page No.

TABLE OF CONTENTS (Continued)

Page

TABLE OF CONTENTS (Continued)

VOLLUME 2. NONPRECISION APPROACH PROCEDURE (NPA) CONSTRUCTION

TABLE OF CONTENTS (Continued)

Page

VOLUME 3. PRECISION APPROACH (PA) AND APPROACH WITH VERTICAL GUIDANCE (APV) APPROACH PROCEDURE CONSTRUCTION

VOLUME 4. DEPARTURE PROCEDURE CONSTRUCTION

VOLUME 5. HELICOPTER AND POWER LIFT INSTRUMENT PROCEDURE CONSTRUCTION

RESERVED

Chapter 3. Takeoff and Landing Minimums.
Section Two. Establishing Minimum Altitudes/Heights.

3.2 Establish minimum altitudes/heights for each authorized approach CAT.

3.2.1 Minimums altitudes/heights types are:

3.2.1 a. Decision Altitude (DA). A DA is a specified minimum altitude (feet MSL) in a PA or APV instrument approach procedure at which the pilot must decide whether to initiate an immediate missed approach if they do not see the required visual references or to continue the approach. Determine the DA using the appropriate criteria and round the published value to the next higher 1-ft increment (234.10 rounds to 235).

3.2.1 b. Decision Height (DH). RESERVED.

3.2.1 c. Radio Altimeter (RA). See current CAT II/III ILS guidance.

3.2.1 d. Minimum Descent Altitude (MDA). MDA represents the final approach minimum altitude for NPA instrument approach procedures. Each published MDA shall be expressed in feet MSL rounded to the next higher 20-ft increment. Apply criteria as specified by the applicable chapter/criteria to determine the MDA.

3.2.1 d. (1) Each straight-in (SI) approach MDA must provide at least the minimum Final Approach Segment (FAS) and Missed Approach Segment (MAS) Required Obstacle Clearance (ROC) as specified by the applicable chapter/criteria.

3.2.1 d. (2) Each circling MDA (CMDA) HAA must be no lower than that specified in paragraph 3.3.3 and table 3-9. Each CMDA must provide the minimum ROC in the circling maneuvering area and meet the missed approach requirements specified in paragraph 3.2.1d(1). Each published CMDA must provide the minimum required final obstacle clearance in the final approach segment and the minimum required circling obstacle clearance in the circling approach area. Each CMDA must not be above the PFAF altitude and, when applicable, below the straight-in MDA (same CAT) for the highest line of NPA minima on the same chart.

Note: When dual minimums are authorized, the CMDA is compared against the SI MDA associated with the corresponding minima set (i.e., circling with stepdown minimums checked against SI with stepdown minimums).

3.2.2 Adjustments to Minimum Altitudes/Heights. The MDA or DA/H may require an increase under the conditions described below:

3.2.2 a. For PA/APV approaches, determine the minimum HATh based on glidepath angle for each aircraft category using table 3-4.

Table 3-4. Minimum HATh for PA and APV Approach Procedures.

	Aircraft Category			
Glidepath Angle	A	B	C	D & E
2.50° - 2.99° (Military only)	200[1,2]			
3.00° - 3.10°	200[1,2,4]			
3.11° - 3.30°	200[2,4]		250	Not authorized[5]
3.31° - 3.60°	200[2,3,4]		270[4]	Not authorized[5]
3.61° - 3.80°	200[2,3,4]		Not authorized	
3.81° - 4.20°	200[3,4]	250	Not authorized	
4.21° - 5.00°	250	Not authorized		
5.01° - 5.70°	300	Not authorized		
5.71° - 6.40° Airspeed NTE 80 knots	350	Not authorized		

1. PAR minimum HATh = 100 (Military only)
2. LNAV/VNAV and RNP SAAAR minimum HATh = 250
3. LPV w/GPA > 3.5° = 250
4. LDA w/GS = 250
5. USN = 250

3.2.2 b. Precipitous terrain adjustments. In areas characterized by precipitous terrain, in or outside of designated mountainous areas, consideration must be given to induced altimeter errors and pilot control problems. Evaluate and identify terrain as precipitous or non-precipitous using software implementing the FAA-approved algorithms developed for this purpose (not applicable to USAF).

Note: FAA precipitous terrain algorithms were designed to evaluate instrument approach feeder, initial, and final segments. Do not use software implementing these algorithms for other TERPS evaluations (e.g., radar vectoring altitude charts, TAA, or other evaluations not addressed in the June 18, 2004 AFS memorandum, subject Automated Precipitous Terrain Adjustments).

3.2.2 b. (1) Precipitous terrain identified in the final segment. For conventional NPA approaches, increase ROC values by the amount specified by the software/algorithms (USAF; by the amount deemed appropriate by the specialist/approving authority). For PA/non-Baro approaches that permit precipitous terrain in the final segment increase the HATh by 10 percent of the value determined by evaluation of the final and missed segments, e.g., 200 ft increases to 220 ft, 350 ft increases to 385 ft, and recalculate the DA. Do not include adjustments for RASS before determining the precipitous terrain adjustment.

3.2.2 b. (2) Precipitous terrain identified in other approach segments will not directly affect landing minimums, but will impact ROC/minimum altitudes in that segment.

3.2.2 b. (3) Precipitous terrain identified in feeder segments in a designated mountainous area. No increase is required, but ROC may not be reduced from 2000 ft (see Volume 1, chapter 17, paragraph 1720).

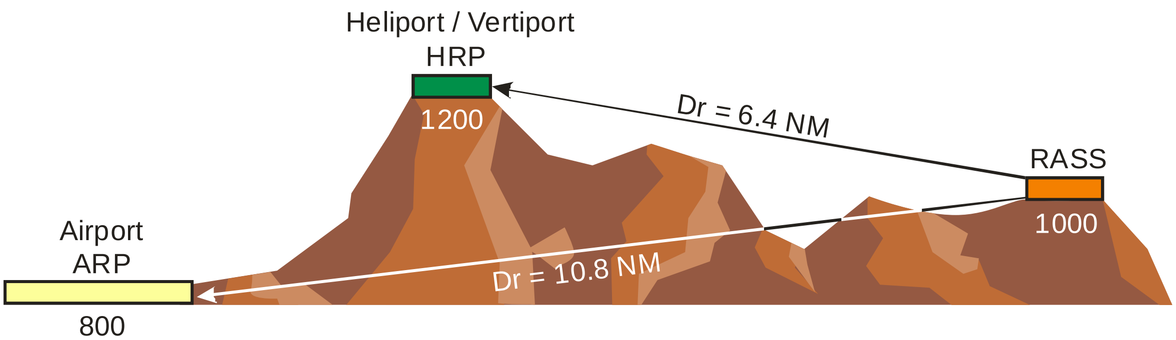
3.2.2 b. (4) Precipitous terrain identified in other segments. When the criteria applicable to the segment requires a precipitous terrain adjustment, increase ROC values by the amount specified by the software/algorithms. (USAF; by the amount deemed appropriate by the specialist/approving authority).

3.2.2 c. Remote Altimeter Setting Source (RASS). Not applicable to minimum safe/sector altitude (MSAs), initials, en route, feeder routes, or segment/areas based on en route criteria. When the altimeter setting is obtained from a source more than 5 nautical miles (NM) from the Airport Reference Point (ARP) for an airport, or the Heliport Reference Point (HRP) for a heliport or vertiport, a RASS adjustment must be considered. A remote altimeter-setting source is not authorized for a remote distance greater than 75 NM or for an elevation differential between the RASS and the landing area that is greater than 6000 ft. To determine which formula to apply, evaluate the terrain between the RASS and the airport/heliport/vertiport for adverse atmospheric pressure pattern effect. Solicit the best available climatological information from the National Weather Service (NWS), the National Aviation Weather Advisory Unit (NAWAU), the Center Weather Service Unit (CWSU), and the local Flight Service Station (FSS).

Note: When a secondary altimeter source must be specified AND either the primary or secondary altimeter source (or both) is considered remote, establish separate landing minima. If establishing separate minima is impractical, publish a chart note specifying the difference between the MDA or DA for primary and secondary sources.

3.2.2 c. (1) Where intervening terrain does not adversely influence atmospheric pressure patterns, use formula 3-1a to compute the basic RASS adjustment in feet. See figure 3-1a.

Figure 3-1a. Basic RASS adjustment (no intervening terrain).



Formula 3-1a. Basic RASS Adjustment (no Intervening terrain).

$$\text{Adjustment} = 2.30D_r + 0.14E_1$$

Where D_r = horizontal dist (NM) altimeter source to ARP/HRP*
E_1 = elevation differential (feet) between RASS elevation and airport/heliport/vertiport elevation

* Copter PinS Approaches. When annotated "Proceed Visually": D_r = Horizontal distance from altimeter source to HRP. When annotated "Proceed VFR": D_r = Horizontal distance from altimeter source to MAP

Examples:

Airport
D_r = 10.8 NM
E_1 = 1000 - 800 = 200 ft

(2.30 * 10.8) + (0.14 * 200) = 52.84 ft basic RASS adjustment
In intermediate segment: 52.84 * 0.6 < 200 (no ROC increase)
In PA/APV final segment: DH = 200 + 52.84 = increase DH to 253
In NPA final segment: 1225 (Controlling obs) + 250 ROC + 52.84 = 1540 MDA

Heliport
D_r = 6.4 NM
E_1 = 1200 - 1000 = 200 ft

(2.30 * 6.4) + (0.14 * 200) = 42.72 ft basic RASS adjustment
In intermediate segment 42.72 * 0.6 < 200 (no ROC increase)
In PA/APV final segment: DH = 200 + 42.72 = increase DH to 243
In NPA final segment: 1225 (Controlling obs) + 250 ROC + 42.72 = 1520 MDA

3.2.2 c. (2) Where intervening terrain adversely influences atmospheric pressure patterns, an Elevation Differential Area (EDA) must be evaluated. The EDA is defined as an area 5 NM each side of a line connecting the ARP/HRP and the RASS, and includes a circular area enclosed by a 5 NM radius at each end of this line. Use formula 3-1b to compute the basic RASS adjustment in feet. See figure 3-1b.

Formula 3-1b. Basic RASS Adjustment (Intervening Terrain)

$$\text{Adjustment} = 2.30D_r + 0.14E_2$$

Where D_r = horizontal dist (NM) altimeter source to ARP/HRP*
E_2 = the elevation differential (feet) between lowest and highest elevation points within the EDA

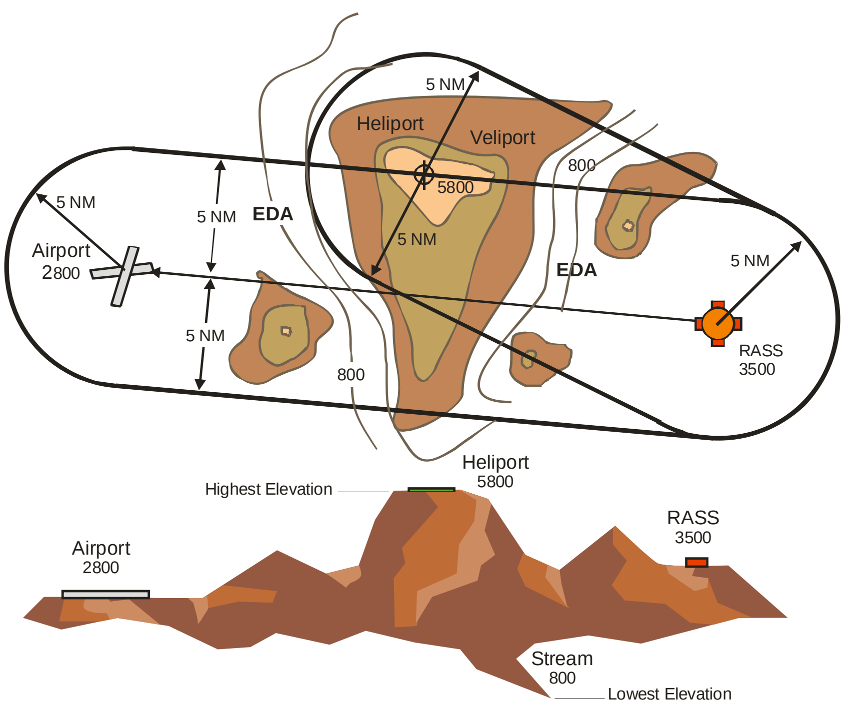
* Copter PinS Approaches. When annotated "Proceed Visually": D_r = Horizontal distance from altimeter source to HRP. When annotated "Proceed VFR": D_r = Horizontal distance from altimeter source to MAP

Examples:

<u>Airport</u>
D_r = 25 NM
E_2 = 5800 - 800 = 5000 ft
(2.30 * 25) + (0.14 * 5000) = 757.5 ft basic RASS adjustment
In intermediate segment 757.5 * 0.6 = 454.5 - 200 (254.5 ft ROC increase)
In PA/APV final segment: DH = 350 + 757.5 = increase DH to 1108
In NPA final segment: 3052.2 (Controlling obs) + 250 ROC + 757.5 = 4060 MDA

<u>Heliport</u>
D_r = 15 NM
E_2 = 5800 - 800 = 5000 ft
(2.30 * 15) + (0.14 * 5000) = 734.5 ft basic RASS adjustment
In intermediate segment 734.5 * 0.6 = 440.7 - 200 (240.7 ft ROC increase)
In PA/APV final segment: DH = 294 + 734.5 = increase DH to 1029
In NPA final segment: 6000 (Controlling obs) + 250 ROC + 734.5 = 7000 MDA

Figure 3-1b. Elevation Differential Area (EDA)
Intervening Terrain Influences Atmospheric Pressure Patterns



3.2.2 c. (3) NPA final segments (including the circling maneuvering area). Increase primary area ROC by the full basic RASS adjustment.

3.2.2 c. (4) PA/APV final segments. Increase the DA (prior to rounding) by the full basic RASS adjustment.

3.2.2 c. (5) For intermediate segments, use 60 percent of the basic RASS adjustment from formulas 3-1a or 3-1b and increase the intermediate segment primary area ROC by the amount this value exceeds 200 ft.

3.2.2 c. (6) When the missed approach design utilizes a turn at altitude prior to the clearance limit and a part-time altimeter source is specified, decrease the turning section Obstacle Clearance Surface (OCS) starting height by the difference between RASS adjustments for the two remote altimeter sources. (Where one altimeter source is local, subtract the full RASS adjustment.) Do not decrease these surface starting heights to less than the OCS at the missed approach point (MAP). If this results in an OCS penetration that cannot be resolved by other methods, provide a second climb-to-altitude determined by adding the difference between the RASS adjustments to the climb-to-altitude and rounding to the next higher appropriate increment. This application must not produce a turn altitude above the missed approach clearance-limit altitude.

Example: MISSED APPROACH: Climb to 6000 (6,100 when using Denver Intl altimeter setting) then…

Note: Combination straight-portion length extension is not required to accommodate the worst-case altimeter source.

3.2.2 c. (7) Helicopter Point in Space (PinS) Approach. When the MAP is more than 5 NM from the PinS approach altimeter-setting source for a PinS-VFR approach, or the HRP is more than 5 NM from altimeter-setting source for a PinS- Special IFR Approach to a VFR Heliport (IVH) approach, RASS adjustment must be applied. For application of the RASS formula, define “Dr” as the distance from the altimeter-setting source to the MAP/HRP accordingly, and define “E1”, or “E2, as specified by formulas 3-1a or 3-1b whereas E1 = the heliport elevation for both PinS-IVH and PinS-VFR.

3.2.2 c. (8) Minimum Reception Altitude (MRA). Where a minimum altitude is MRA based, increase the MRA using the RASS adjustment factor value.

3.2.2 c. (9) Where the altimeter is based on a remote source(s), annotate the procedure and/or publish the appropriate minima lines in accordance with Order 8260.19, Flight Procedures and Airspace.

3.2.2 d. Excessive Length, Nonprecision Final Approach. When a procedure incorporates a final approach fix (FAF), and the final approach segment (FAS) length FAF-to-MAP exceeds 6 NM (plotted positions), increase FAS primary area ROC 5 ft for each one-tenth NM over 6 NM.

EXCEPTION: If a stepdown fix exists and the remaining segment length is less than 6 NM, the basic FAS ROC may be applied between the stepdown fix and the MAP. See formula 3-2 (Excessive Length Adjustment).

Formula 3-2. Excessive Length Adjustment

$$Adjustment = 50(Length_{final} - 6)$$

Where $Length_{final}$ = horizontal distance in NM from plotted position of FAF to MAP

$$50*(Length_{final}-6)$$

Example

Distance FAF to MAP = 6.47

Adjustment = 50(6.47- 6) = 23.5

250 ROC + 23.5 = 273.5 adjusted ROC

Chapter 3. Takeoff and Landing Minimums
Section Three. Visibility Minimums

3.3 Visibility Minimums.

3.3.1 Authorization.

3.3.1 a. Straight-in visibility minimums are authorized when:

3.3.1 a. (1) Applicable straight-in alignment standards are met, and

3.3.1 a. (2) The final approach segment vertical descent angle does not exceed tolerances [see paragraph 252].

3.3.1 b. Circling visibility minimums are authorized when:

3.3.1 b. (1) Straight-in alignment cannot be met (e.g., for "Circling-only" procedures not meeting straight-in alignment requirements) [see paragraph 162].

3.3.1 b. (2) Straight-in alignment requirements are met, but descent angle precludes publication of straight-in minimums [see paragraph 252].

3.3.1 b. (3) Published in conjunction with straight-in minimums.

Note: Do not establish circling minima when PA or APV procedures are established without accompanying SI NPA minima.

3.3.2 Establishing Straight-in Visibility Minimums. Establish as RVR where authorized. Otherwise, establish as a statute mile (SM) value. Meter (M) values are for locations outside the United States only.

3.3.2 a. Step 1. Find the visibility (RVR or SM) appropriate to the HATh and ALS from the applicable table(s). When more than one table applies, use the highest value.

3.3.2 a. (1) Table 3-5a specifies standard civil and military straight-in minimums except for CAT A and B NPA, Category II/III ILS, Special Authorization (SA) Category I/II ILS, and helicopter approaches.

3.3.2 a. (2) Use table 3-6 exclusively for CAT A straight-in NPA approaches. Use table 3-7 exclusively for CAT B straight-in NPA approaches.

3.3.2 a. (3) Use table 3-8 for CAT C/D/E straight-in NPA approaches after determining the visibility minimums prescribed by table 3-5a.

Appendix 2
Simultaneous Independent Parallel Instrument Approaches [SIPIA] – Widely Spaced Runways

1. Overview. This appendix defines requirements for SIPIA operations to parallel runways (see Pilot/Controller Glossary definition) separated by not less than 4,300 ft using ILS, RNAV required navigation performance [RNAV(RNP)], or RNAV(GPS) approaches. Other simultaneous parallel approach operations are approved per Air Traffic Control [ATC] directives or other Flight Standards criteria.

Note: SIPIA operations require vertical guidance in the final approach, and are not authorized when a glidepath is not available to all participating aircraft (i.e., due to an equipment outage or when azimuth-only approach procedures are used).

2. Radar monitoring/Instrument Approach Availability. SIPIA operations to runways spaced by 9,000 ft or less (9,200 ft where airport elevation is 5,000 ft MSL or higher) require an approved ATC Radar/Final Monitor Aid [FMA] as defined in Order 7110.65, Air Traffic Control and Pilot/Controller Glossary. All widely spaced SIPIA operations also require at least one of the following;

a. An ILS approach.

b. RNAV (GPS) or RNAV (RNP) approach. Only procedures with LPV, LNAV/ VNAV, or RNP minima with an annotation that use of GPS and Flight Director/Autopilot is required may be approved for widely spaced SIPIA operations.

3. Runway Spacing. The required spacing between runways/procedure FACs for dual/triple widely spaced SIPIA operations is in accordance with Order 7110.65 as established by FAA Flight Standards. Quadruple or more widely spaced SIPIA operations are not covered by this directive and requires a site-specific Flight Standards Flight Systems Laboratory [AFS-450] safety analysis.

4. Approach Procedures. Instrument approach procedures used for widely spaced SIPIA operations must comply with the applicable design standard(s), except as follows;

a. Missed approaches with radius-to-fix [RF] turns require AFS-400 approval.

b. Dual widely spaced SIPIA operations. Missed approach courses must have a combined divergence of at least 45 degrees.

c. Triple widely spaced SIPIA operations. The missed approach course for the center runway is a continuation of the FAC. The course for each 'outboard' runway must diverge at least 45 degrees from the center runway in opposite directions. At least one outside parallel shall have a turn height specified that is not greater than 500 ft above the TDZE/THLD elevation for that runway.

d. Quadruple widely spaced SIPIA operations. Course divergence is as specified by AFS-450 safety analysis.

e. Where an alternate missed approach has been established for an approach authorized for use during widely spaced SIPIA operations, it must also comply with the preceding restrictions.

5. No Transgression Zone (NTZ) and Normal Operating Zones (NOZ) are established by ATC for each adjacent runway pair used during widely spaced SIPIA operations.

a. The NTZ is 2,000 ft wide equidistant between the approach courses for the runway pair. It begins at the farthest point in the adjacent runway pair where any aircraft established on the approach is permitted to lose vertical/lateral separation (point "S"). It ends 0.5 NM past the farthest departure DER in the pair or where the missed approach tracks diverge, whichever occurs last (see figures A2-1 and A2-2).

Note: The NTZ dimensions are not affected by the point where ATC is permitted to discontinue radar monitoring.

b. The area remaining between the approach courses and the edge of the NTZ is the NOZ.

Figure A2-1. No Transgression and Normal Operating Zones (Dual Approach).

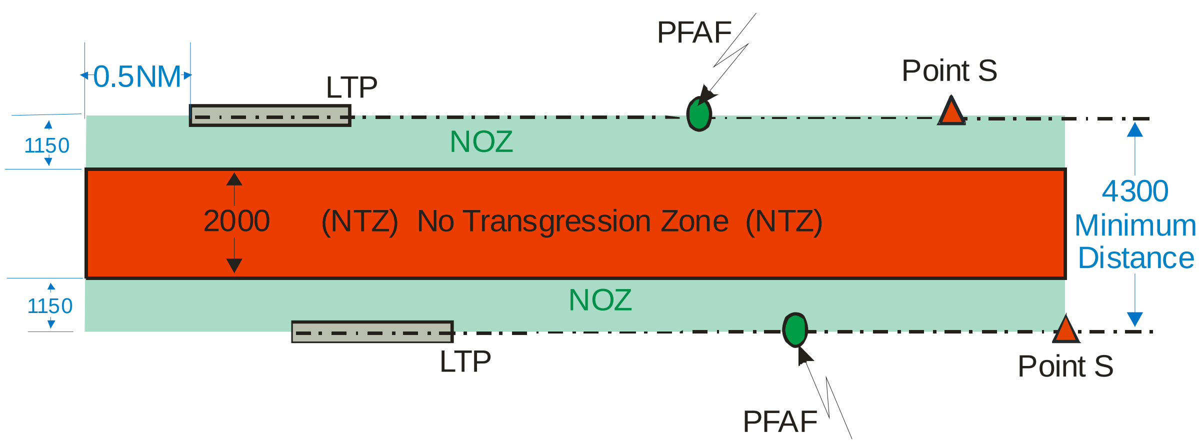


Figure A2-2. No Transgression and
Normal Operating Zones (Triple Approach).