

ORDERU.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

8260.39

2/18/94

SUBJ: CLOSE PARALLEL ILS/MLS APPROACHES

- 1. PURPOSE.** This order provides criteria for establishing simultaneous independent ILS/MLS precision approaches to closely-spaced dual parallel runways. These criteria are based on the use of precision runway monitoring (PRM) and are applicable to parallel runways with centerlines separated by 3,400 to 4,300 feet and are in agreement with the results of data collected from the close parallel terminal procedures development program.
- 2. DISTRIBUTION.** This order is distributed to the branch level in the Office of Aviation Policy, Plans, and Management Analysis; Integrated Safety Analysis; Aviation System Standards; Airport Safety and Standards; Flight Standards Service; Air Traffic Rules and Procedures; Research and Development; Systems Maintenance; Program Director for Navigation and Landing; and to the branch level in the regional Flight Standards, Air Traffic, Airway Facilities, and Airports Divisions; to the division level of the National Airway Systems Engineering, and the Regulatory Standards and Compliance Divisions at the Mike Monroney Aeronautical Center; and to all Flight Inspection Area Offices; International Flight Inspection Offices; Flight Standards District Offices; Airway Facilities Sectors; Sector Field Offices; and addresses on special distribution lists ZVS-827 and ZAT-423.
- 3. BACKGROUND.** Expansive tests have disclosed that under certain conditions, capacity at the nation's busiest airports may be significantly increased with independent simultaneous parallel approaches to runways that are more closely spaced than the minimum of 4,300 feet currently required in Order 8260.3B, U.S. Standard for Terminal Instrument Procedures (TERPS). Tests have shown that a reduction in minimum separation between parallel runways may be achieved by use of high update radar with high resolution displays and automated blunder alerts.
- 4. GENERAL.** Criteria contained in this order are designed for independent simultaneous precision ILS or MLS operations to dual parallel runways with centerlines separated by at least 3,400 feet, but less than 4,300 feet. Simultaneous close parallel operations at airport elevations above 1,000 feet MSL and deviations from these criteria or glidepath angles above the U.S. civil standard of 3 degrees shall not be established without approval from the Flight Standards Service, FAA, Washington, DC. These operations require final approach radar monitoring, accurate to within 1.0 milliradian, an update interval of 2.4 seconds or less, and a final monitor aid (a high resolution display with automated blunder alerts). In these criteria, ILS "glideslope/localizer" terms are synonymous to and may be used interchangeably with MLS "elevation/azimuth" terms. Independent simultaneous close parallel approaches without altitude separation should not be authorized at distances greater than 10 NM from thresholds. If ATC systems and procedures are established which assure minimal operational disruptions due to No Transgression Zone (NTZ) intrusions, this distance may be extended up to 12.5 NM. A separate instrument approach chart shall be published when the procedure does not overlay the existing ILS/MLS;

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AVN-210/AFS-420

e.g., different missed approach construction and/or instructions, chart clutter, etc. A breakout obstacle assessment should be completed as part of the initial evaluation for parallel operations. Unless otherwise specified in this order, criteria in Orders 8260.3B, U.S. Standard for Terminal Instrument Procedures (TERPS); and Order 8260.36, Civil Utilization of Microwave Landing System (MLS); shall apply.

5. SYSTEM COMPONENTS. Simultaneous close parallel approach procedures are not authorized if any component of the Precision Runway Monitor (PRM) system is inoperative. System requirements for simultaneous close parallel approach procedures are:

a. ILS/MLS. A full ILS or MLS on each runway.

b. Precision Runway Monitor. A PRM system includes the following:

(1) Radar. Back-to-back secondary surveillance radar beacons with a function to automatically correct back-to-back antenna bias error or a phased array electronically scanned (E-Scan) antenna; update intervals not to exceed 2.4 seconds; PRM back-to-back antennas have three interrogator channels (two active and one back-up); PRM E-Scan antennas have two interrogator channels (one active, one back-up).

(2) Final Monitor Aid (FMA). Large (not less than 20" x 20"), high resolution (100 pixels/inch minimum), color monitors with associated visual and audible alerts.

(a) A caution alert when the system predicts that an aircraft will enter the NTZ within 10 seconds (e.g., the target symbol and data block change from green to yellow and a voice alert sound).

(b) A warning alert when the aircraft has penetrated the NTZ, (e.g., the target symbol and data block change to red).

(c) A surveillance alert when the track for a monitored aircraft inside the monitor zone has been in a coast state for more than three consecutive updates (e.g., the target symbol and data block change to red).

6. PROCEDURE IDENTIFICATION. Order 8260.3B, paragraph 161 applies, except where a separate procedure is published. In this case, "Close Parallel" should precede the approach title identification; e.g., "CLOSE PARALLEL ILS RWY 27R." When utilizing an *existing* ILS/MLS procedure, notes for approach charts for use in the close parallel operation shall be published in bold and caps as follows: "Simultaneous CLOSE-PARALLEL approaches authorized with Runways (number) L/R" and "LOCALIZER ONLY NOT AUTHORIZED DURING CLOSE-PARALLEL OPERATIONS."

7. TERMINOLOGY.

a. Automated Alert. A feature of the PRM that provides visual and/or audible alerts to the monitor controller when an aircraft is projected to enter or has entered the NTZ. Paragraph 5b(2) defines the PRM system alerts.

- b. Back-to-Back Radar.** Two beacon antennas rotating at conventional ASR rates to yield update intervals of not more than 2.4 seconds and an accuracy not less than 1 milliradian (0.057 degree) root mean square (RMS).
- c. Breakout.** A technique to direct aircraft out of the approach stream. In the context of close parallel operations, a breakout is used to direct threatened aircraft away from a deviating aircraft.
- d. Close Parallels.** Two parallel runways whose extended centerlines are separated by at least 3,400 feet, but less than 4,300 feet, having a precision runway monitoring system that permits simultaneous *independent* LS/MLS approaches.
- e. E-Scan Radar.** An electronically scanned phased array radar antenna that is cylindrical and stationary. It consists of interrogators and a surveillance processor providing an azimuth accuracy of at least 1 milliradian (0.057 degree) RMS and an update interval of not more than 2.4 seconds.
- f. Localizer/Azimuth Offset.** An angular offset of the localizer/azimuth from the runway extended centerline in a direction away from the NTZ that increases the normal operating zone (NOZ) width.
- g. Glide slope Differential.** Increasing the glide slope angle of one parallel approach relative to the other (3-vs.-4 degree) to provide additional vertical separation.
- h. Monitor Zone.** The monitor zone is the volume of airspace within which the final monitor controllers are monitoring close parallel approaches and PRM system automated alerts are active.
- i. No Transgression Zone (NTZ).** The NTZ is a 2,000-foot wide zone, located equidistant between parallel runway final approach courses in which flight is not allowed. See figure 1.
- j. Normal Operating Zone (NOZ).** The NOZ is the operating zone within which aircraft flight remains during normal independent simultaneous parallel approaches. See figure 1.
- k. Precision Runway Monitor (PRM).** A specialized ATC radar system providing continuous surveillance throughout the monitoring control zone. It includes a high accuracy, high update rate sensor system, and for each runway, a high resolution color FMA with automated alerts. The PRM system provides each monitor controller with a clear, precise presentation of aircraft conducting approaches.
- l. Staggered Runway Thresholds.** A displacement along runway centerline of the threshold of one parallel runway relative to the threshold of the other. Staggered runway thresholds provide additional vertical separation between aircraft on the glide slope during approaches compared to thresholds that are exactly side-by-side. See figure 1.
- 8. FEEDER ROUTES.** Order 8260.3B, chapter 2, sections 2 and 3, applies.
- 9. INITIAL APPROACH SEGMENT.** Except as stated herein, Order 8260.3B, chapter 2, section 3, applies. The initial approach shall be made from a NAVVAID, fix, or radar vector. Procedure turns and high altitude penetration procedures shall not be authorized.

a. **Altitude Selection.** Altitudes selected shall provide obstacle clearance requirements and a minimum of 1,000 feet vertical separation between aircraft on the two parallel final approach courses in the interval from localizer intercept to glideslope capture.

b. **Localizer Intercept Point.** Apply Order 8260.3B, paragraph 922, except optimum localizer intercept angles are 20 degrees or less and the maximum intercept angle shall not exceed 30 degrees.

10. **NO TRANSGRESSION ZONE (NTZ).** An NTZ is established and depicted on the FMA as a protected zone 2,000 feet wide, equidistant between parallel runway centerlines, beginning from the point where adjacent inbound aircraft first lose 1,000 feet of vertical separation, and extends to 0.5 NM beyond the farthest departure end of runway (DER), or the point where a combined 45 degree divergence occurs, whichever is farthest. Where an offset localizer is determined to provide operational advantage, the NTZ shall be established for the final segment equidistant between adjacent final approach courses beginning and ending as stated above. The beginning of the NTZ for the final segment should begin at the most distant precision final approach fix (PFAF). See figure 1.

11. **NORMAL OPERATING ZONE (NOZ).** An NOZ is established so that the NOZ for each close parallel runway is not less than 700 feet wide on each side of the approach course at any point. The width of the NOZ is equal on each side of the final approach course centerline, and the half-width is defined by the distance from the nearest edge of the NTZ to the final approach course centerline. The length of the NOZ equals the length of the NTZ. Each parallel runway provides an NOZ for the final and missed approach segments that equals the length of the NTZ. See figure 1.

12. **MINIMUMS.** For close parallel procedures, only straight-in precision minimums apply.

13. **INTERMEDIATE APPROACH SEGMENT.** Order 8260.3B, paragraph 922 applies, except close parallel procedures have a straight intermediate segment aligned with the final approach course. Where an *existing* ILS/MLS procedure is published with a transition intercept angle greater than 30 degrees which cannot be reduced, a separate close parallel procedure shall be established with intercept angles of less than 30 degrees.

14. **FINAL APPROACH SEGMENT.** Orders 8260.3B, and 8260.36 apply. In addition to these criteria, independent simultaneous approaches to close parallels runways require the following:

a. **Close Parallel Approach Runway Separation.** Approaches shall have a minimum of 3,400 feet separation between the parallel final approach courses.

b. **Precision Runway Monitor (PRM).** A PRM system must be in operation and providing service in accordance with paragraph 5 of this order.

c. **No Transgression Zone (NTZ).** An appropriate NTZ shall be established between close parallel final approach courses as described in paragraph 10. See figure 1.

d. **Normal Operating Zone (NOZ).** Appropriate NOZ's shall be established for each parallel final approach segment as described in paragraph 11. See figure 1.

e. Staggered Runway Thresholds. Where thresholds are staggered, the glideslope intercept point from the most distant runway approach threshold should not be more than 10 NM. It is recommended that the approach with the steeper glideslope and/or higher intercept altitude should be to the runway having the most distant approach threshold (from the point of view of an aircraft on approach). See figure 1.

f. Localizer/Azimuth Offset. Where operationally advantageous, the final approach segment may be extended beyond 10 NM by offsetting the localizer/azimuth and increase the final 3 NM for each degree of offset, not to exceed 3 degrees. (This option is in addition to the extension to 12.5 NM by use of ATC systems and procedure.) Where an offset localizer is utilized, apply FAA Order 8260.3B, paragraph 930a. Where approach thresholds are staggered, the offset localizer course should be to the runway having the nearest approach threshold (from the point of view of an aircraft on approach). An offset requires a 50-foot increase in DH and is not authorized for CAT II and CAT III approaches. (Autopilots with autoland are programmed for localizers to be on runway centerline only.) The NTZ shall be established equidistant between final approach courses.

g. Glideslope Differential. Where operationally advantageous, a differential of 1 degree between 3 and 4 degree glideslopes will provide a 1,000 foot vertical separation at 10 NM, allowing a 3,000 foot intercept for the 3 degree glideslope, and a 4,000 foot intercept for a 4 degree glideslope. Where special operational advantage can be justified, glideslopes up to 6.0 degrees for special performance aircraft may be approved. Glideslope angles above 3 degrees must be approved by Flight Standards Service. Where glideslope angle differentials are utilized with staggered thresholds, the steeper glideslope should be established to the runway having the most distant approach threshold (from the point of view of an aircraft on approach).

h. Monitor Zone. This zone is a radar monitored volume of airspace within which the PRM system automated alerts are active. The extent of the monitor zone is:

(1) Monitor Zone Length. The PRM monitor zone begins where aircraft conducting simultaneous parallel approaches reach less than 1000-foot vertical separation during final approach (typically at glideslope intercept for the higher altitude localizer intercept) and extends to 0.5 NM beyond the farthest departure end of runway (DER), or the point where a 45-degree divergence occurs, whichever generates the greatest length for the monitor zone.

(2) Monitor Zone Width. The PRM monitor zone (automated alerts) includes all of the area between the final approach courses and extends 0.5 NM outboard of each final approach course centerline.

(3) Monitor Zone Height. The PRM monitor zone height may be defined in as many as five separate segments, each having an independent maximum height. Each segment covers the entire monitor zone width, and a portion of the monitor zone length. Within each segment, the monitor zone height extends from 50 feet above ground level to a minimum of 1,000 feet above the highest point within that segment, of the glideslope, the runway surface, or the missed approach course, whichever attains the highest altitude.

15. MISSED APPROACH SEGMENT. Except as stated herein, Orders 8260.3B, and 8260.36, apply. Missed approach procedures for close parallels shall specify a turn as soon as possible after reaching a minimum of 400 feet above the TDZE, and diverge at a minimum of 45 degrees. The turn points specified for the two parallel procedures should be established at the end of the straight segment minimum of 1.5 NM. A 45 degree divergence shall be established by 0.5 NM past the most distant DER. Where an offset

localizer is used, the first missed approach turn point shall be established so that the applicable flight track radius (Table 5, TERPS), constructed in accordance with chapter 2, section 7, Order 8260.3B, for the fastest category aircraft expected to utilize the offset course, shall not be less than 700 feet from the NTZ.

a. NTZ. The NTZ shall be continued into the missed approach segment, as defined in paragraph 10 of this Order. See figure 1.

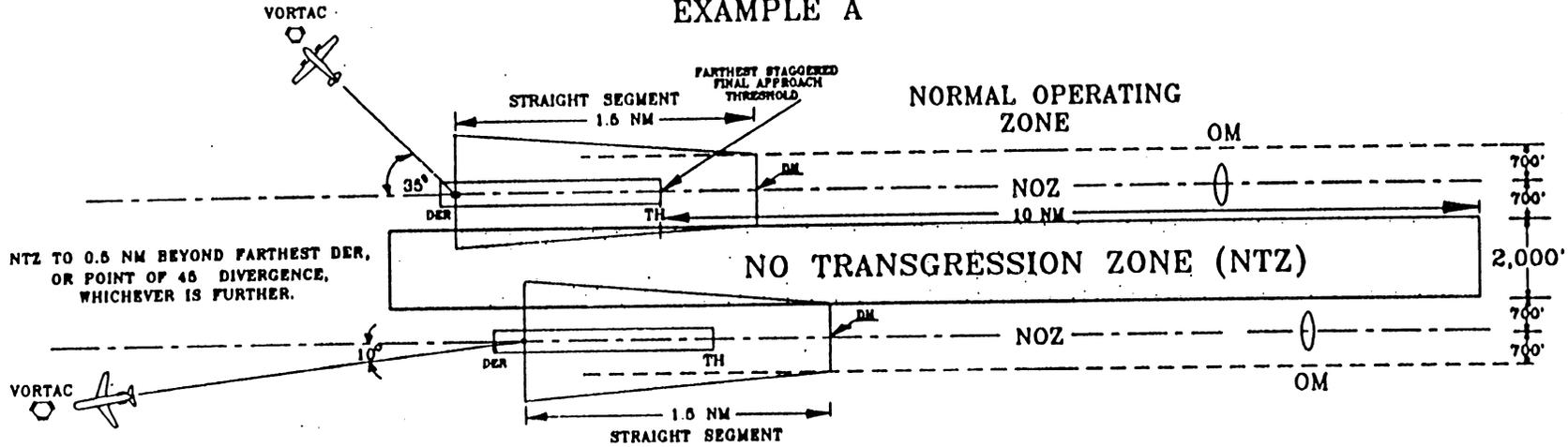
b. NOZ. The NOZ shall be continued into the missed approach segment, as defined in paragraph 11 of this Order. See figure 1.



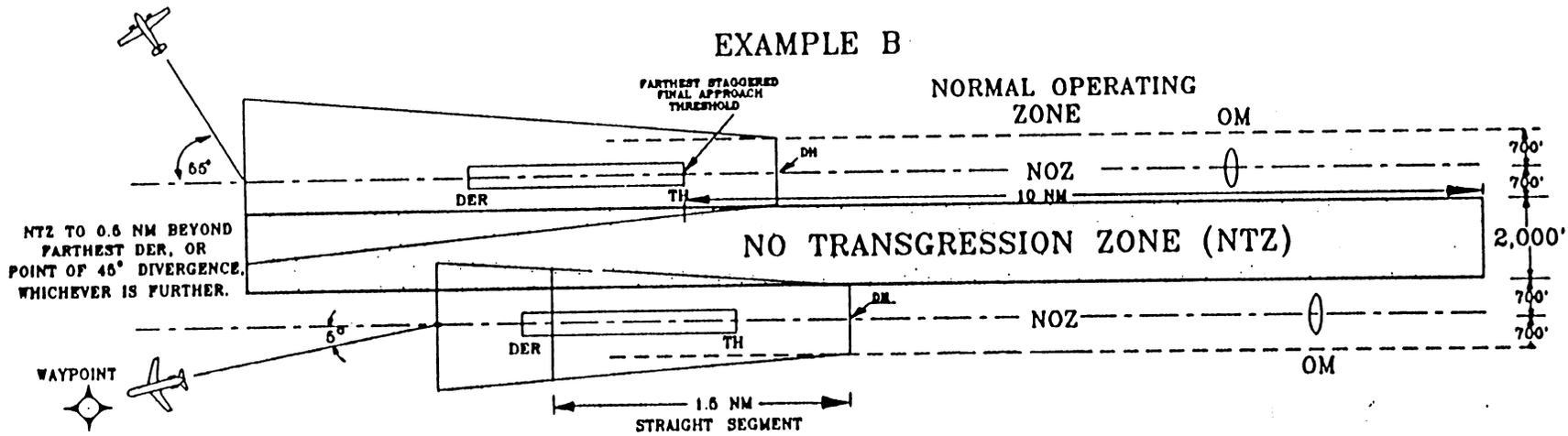
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FIGURE 1. Examples of Close Parallel Finals and Missed Approach Segments

EXAMPLE A



EXAMPLE B





U.S. Department
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Please submit any written comments or recommendations for improving this directive, or suggest new items or subjects to be added to it. Also, if you find an error, please tell us about it.

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