1. **PURPOSE.** This Notice is being issued to provide guidance for flight inspection of localizers and glide slopes, utilizing Simultaneous Offset Instrument Approach (SOIA) operations.

2. **DISTRIBUTION.** This Notice is distributed to the National Airspace System Implementation Program Communication, Navigation, and Surveillance Platform; to Flight Standards Service Flight Procedures Standards Branch; to Eastern, Central, and Western Service Areas; to Air Traffic Control Tower Sector Field Offices; to System Support Center Sector Field Offices; to the Air Traffic Control Tower and the System Support Center St Louis; to the Air Traffic Control Tower and the System Support Center San Francisco; to the Air Traffic Control Tower and System Support Cleveland; and to all Aviation System Standards Flight Inspection Operations crewmembers.

3. **CANCELLATION.** This Notice cancels N 8200.82, dated June 30, 2005.

4. **BACKGROUND.** The implementation of SOIA operations has provided a new use for localizers and glide slopes. The SOIA concept allows increased lateral spacing of aircraft during approaches to two closely spaced parallel runways when one Final Approach Course (FAC) is offset away from runway centerline. A side-step after reaching Decision Altitude (DA) delivers the aircraft to a visual centerline. A Precision Runway Monitor (PRM) will be associated with the SOIA.

5. **REQUIREMENTS.** SOIA operations require a Localizer Directional Aid (LDA) sited for an approach course no more than 3.0° from runway bearing and not crossing the extended runway centerline. For flight inspection, this is similar to many single runway LDA installations. The addition of a glide slope conventionally sited for runway centerline operations complicates the matter, as glide slope guidance is required both on the LDA course and in the visual segment.

   a. **AFIS/RTT Use.** The flight inspection profiles need slight modifications to ensure coverage of all procedural needs. Two facility data sheets may be required. The first data sheet would be the normal or conventional facility data sheet. The second data sheet would be one which would incorporate a "pseudo runway" to facilitate accurate LDA alignment analysis using the AFIS.
(1) **Differential Global Positioning System (DGPS) Operations.** An AFIS supplemented with a DGPS affords the most accurate flight inspection results, and is the primary method to check all SOIA facilities. Runway lengths may be changed to no less than 2,000 ft in the AFIS Facility DataBase (FDB), to expedite AFIS processing time. The aircraft is not required to deviate from the designed procedural offset LDA azimuth to the runway centerline to obtain LDA approach results. Continue on the LDA course until *abeam* the runway end (actual or shortened per FDB), and AFIS will announce results with no further operator actions. The alignment area can be changed from 1 nm (to threshold) to a maximum of 4 miles (to 3 miles) from threshold with accurate results.

(2) **RTT Operations.** Some facilities may require the use of a Radio Telemetering Theodolite (RTT) to measure LDA structure and alignment. See RTT operations guidance contained in Order VN200 8240.52.

**b. LDA.** The only modification from the standard FAA Order 8200.1 procedures is a potential change to the alignment measurement area. Alignment should normally be 1.0 nm from the LDA missed approach point to the missed approach point. Due to the SOIA approach design, the MAP is typically 2.5 to 3.5 nm from the runway. Unless DGPS is used, the Automated Flight Inspection System (AFIS) loses accuracy in relation to distance between the alignment area and the runway updates. It is important, therefore, when DGPS is unavailable, to keep this distance to a minimum when AFIS is used to compute alignment. This may entail building a pseudo runway in the facility database. A pseudo runway may be derived by LDA antenna, runway intersections/ends, or surveyed points in the airport environment, etc. Points used must be visible through the Television Positioning System (TVPS). *The TVPS must be used to obtain the update accuracy required for SOIA operation, when DPGS is unavailable.*

While a pseudo runway is ideally a straight-line extension of the final approach course, it may be offset to facilitate computer updating; it thus becomes similar to a typical offset localizer.

It is acceptable to measure LDA alignment inside the charted missed approach point, as close as 1.0 nm from the pseudo threshold to the pseudo threshold (1.5 nm to 0.5 nm if the LDA antenna is the pseudo threshold). When alignment is measured inside the DA, determine an altitude, no higher than 100 ft below the DA, which is free of adverse structure and bends and will provide an accurate representation of LDA alignment. In the interest of standardization, pseudo runways used for SOIA procedures shall be developed or approved by Aviation System Standards Flight Inspection Policy Team, AJW-331. If RTT is used, determine alignment 1.0 nm from the missed approach point to the missed approach point, unless structure, bends, or theodolite tracking difficulties prevent accurate analysis. If this occurs, measure alignment in any stable 1 nm segment inside or outside of the DA. Document the alignment measurement area used on the flight inspection report and the facility data sheet for use on all subsequent inspections.

Just as we normally measure a conventional glide slope to 100 ft below the published DA (traditional Point "C") to allow for altimeter errors and provide a margin of safety, we need to ensure LDA and glide slope signal to 100 ft below the SOIA DA (0.31 nm inside the DA for a 3.00° glide angle).
Closely monitor the signal and aircraft position for any indication of course bending to ensure that the measurement area represents the alignment in the last mile before the DA.

SOIA LDA alignment and structure shall be measured using AFIS or RTT. Use CAT I ILS analysis techniques (Zone 2 structure measured from the actual LDA alignment). Do not report LDA alignment as "S/ U".

c. Glide Slope

Both additional runs and modifications to normal procedures are necessary to inspect the glide slope. AFIS (TVPS/ DGPS) or RTT may be used.

Based on calculations for the existing procedures, we expect to need an Expanded Service Volume (ESV) to 1 or 2° beyond the normal 8° limit on the LDA side of the runway. This will provide coverage in the area near the DA at the LDA 150 μA point. For the Usable Distance check, fly the ESV limit rather than the 8° on that side.

The normal ILS-3 on the FAC must be flown on-path on the LDA procedural course to 100 ft below the DA, through the procedure's visual "side-step" portion, continuing to the actual runway. Establish wings-level by the Stabilized Approach Point (SAP), defined as 500 ft above the GPI on the runway centerline-extended. It is important to maintain a centered glide slope indicator in the "side-step" to minimize erroneously displayed structure. Using AFIS, measure structure in Zone 1, Zone 2 to 100 ft below DA on the LDA procedural course ground-track, then through the "side-step" maneuver. Manually measure structure from the graphical average path during the "side-step" maneuver. AFIS-announced structure inside the SAP is not used for tolerance application on this profile.

Additional ILS-3(s) must be flown oriented to runway centerline from at least 6 nm from threshold. Fly a visual runway centerline-extended ground-track to establish the glide slope actual angle, structure, and mean width.

The tilt checks must be completed on two distinct sets of ground-tracks; using both the actual LDA 150 μA limits, as well as simulated half-course width limits based on a mythical ("0" offset) localizer as though installed on runway centerline. Clearance Below Path (CBP) runs for the tilt checks about the LDA procedural course track must be flown at LDA Full Scale Deflection, starting from the GSI distance or 10 nm (whichever is closer to the glide slope antenna), to the point 100 ft below the DA. The mythical LDA concept involves changing the conventional database for a localizer offset of "0", and changing the localizer front and back course bearing to reflect the runway front and back-course bearing. Tilt and RF alarm checks are then referenced to points on runway centerline abeam the LDA and glide slope, respectively. The AFIS is used for aircraft guidance. When tilt is measured about the mythical LDA on runway centerline, check CBP at an azimuth that corresponds to the mythical LDA half width points, starting from the GSI distance or 10 nm (whichever is closer to the glide slope antenna), to the normal runway oriented Point "B".
Normal and monitor alarm reference CBP runs must be flown on the LDA procedural course, starting from the GSI distance or 10 nm (whichever is closer to the glide slope antenna), to the point 100 ft below DA. The CBP check is continued through the SOIA procedure's visual "side-step" maneuver to the runway centerline-extended ground-track, terminating at the normal runway oriented Point "C".

The remaining glide slope ILS-2 normal and monitor alarm reference measurements must be flown on the LDA procedural course ground-track. If the GSI is designed so as to occur beyond the glide slope SSV, the associated GSI altitude will result in impractical SBP distances. Use and document an ILS-2 altitude that provides SBP within the SSV. Use the actual angle obtained on the ILS-3 run, oriented to the runway centerline-extended, to compute the ILS-2 level run correction factor.

6. PERIODIC INSPECTIONS. The periodic checks must consist of:

a. ILS-1 runs in relation to the LDA procedural course for Order 8200.1 checklist configurations appropriate for the type of equipment (Pseudo or conventional FDB).

b. ILS-2 runs flown on the LDA procedural course in Order 8200.1 checklist configurations appropriate for the type of equipment (Conventional FDB).

c. LDA ILS-3 runs flown on the LDA procedural course, measuring LDA alignment and structure, from 10 nm or the GSI distance (whichever is closer) to a point 100 ft below the DA (Pseudo FDB, or RTT/ DGPS with a conventional FDB).

d. Glide Slope ILS-3 runs flown on visual runway centerline-extended, measuring glide slope angle and structure from the GSI distance or 6 nm, whichever is closer to the glide slope antenna, to conventional runway oriented Point "C" (Conventional FDB).

e. Glide Slope ILS-3 runs on the LDA procedural course ground-track from the GSI distance or 10 nm (whichever is closer) to 100 ft below the DA, then through the procedure's visual "side-step" portion, continuing to the normal TVPS runway updates (Conventional FDB).

7. DOCUMENTATION. ILS Flight Inspection Reports, must contain:

a. LDA structure as measured to 100 ft below the DA reported in the structure field.

b. Glide Slope structure measurements must encompass the ground-tracks of the (1) LDA procedural course, (2) side-step maneuver between 100 ft below the DA on the LDA procedural course to the SAP (500 ft above the GPI on runway centerline- extended), and (3) runway centerline extended. SEE ATTACHMENT 1.

(1) Zone 1 structure must be reported in the structure field, as measured on the LDA procedural course ground-track.
(2) **Zone 2 structure** must be reported in the structure field:

(a) **From 4 nm to 100 ft below the DA** as measured on the LDA course ground-track

(b) **From 100 ft below the DA** distance to conventional Point "B" as measured on the runway-extended ground-track. *Report the greatest structure from these two runs in the structure field. Report the maximum structure measured in the "side-step" maneuver in Remarks on the report.*

(3) **Zone 3 structure** must be reported in the structure field, as measured on the runway centerline extended ground-track from conventional Points "B" to "C".

c. **Report the angle measured** on the runway centerline-extended ground-track on the report. Do not report the AFIS-announced angle obtained on the LDA procedural course or the "side-step" maneuver.

Each SOIA facility will have peculiarities such as non-standard updating and/ or special techniques for their inspections. Specific instructions for individual SOIA facilities will be posted in the Aircrew Information File under: LINKS then UNUSUAL FACILITIES.

Original signed by
Joe F. Doubleday for

Thomas C. Accardi
Director of Aviation System Standards

Attachment
Glide Slope Structure Analysis Drawing
Attachment 1 - Glide Slope Structure Analysis

The following represents 2 separate runs flown on a SOIA facility for the purpose of analyzing and reporting the glide slope structure. (This graphic must be printed in color).

ILS-3 run using Loc offset = 0, FCB and BCB = RWY FCB and BCB. Fly runway centerline extended. Use for analysis of structure as illustrated, actual angle, and mean width.

GS ILS-3 runs on the LDA procedural course using conventional FDB. Use for analysis of Zone 1 structure and Zone 2 structure to the distance that represents 100 ft below DH.

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**GLIDE SLOPE STRUCTURE ANALYSIS**

- Pink: Report structure (manual analysis) in Remarks.
- Blue: Zone 1 - Structure (AFIS or Manual analysis) in the structure field.
- Green: Zone 2 - Report the greatest structure from these 2 runs (AFIS) in the structure field.
- Orange: Zone 3 - Report in the structure field.