NATIONAL TRANSPORATION SAFETY BOARD
WASHINGTON, D.C.

DCA19FA089

AIRPORT SPECIALIST'S FACTUAL REPORT

ATTACHMENT 5

FAA GUIDANCE

23 Pages

1. November 2019 Letter to Airport Sponsors
2. AC 150/5200-30D Change 2 Draft
3. November 2015 Engineering Tips

U.S. Department
of Transportation
**Federal Aviation
Administration**

Office of Airports Safety and Standards

800 Independence Ave., SW
Washington, DC 20591

NOV 01 2019

Dear Airport Sponsor:

This letter provides awareness of recent changes to an internal Federal Aviation Administration (FAA) Order regarding maintenance of Instrument Landing Systems. This information is being shared to ensure you have the same information as the local FAA technicians who service your area.

Background

Large amounts of snow can change the surface area in front of an Instrument Landing System (ILS) localizer (LOC) and consequently may affect the LOC radiated signal. The FAA recently issued an interim change to Joint Order (JO) 6750.49B, Maintenance of Instrument Landing Systems (ILS) Facilities, providing a "Localizer Snow Evaluation and Action" procedure for FAA's ILS system specialists. This procedure advises technicians on what to look for during snow events, and increases awareness of a possible hazardous condition.

In conjunction with this interim change, the FAA also issued an internal joint memorandum that I have enclosed, clarifying the operational considerations and expectations for the FAA System Operations Technicians interaction with Airport Operators. Since the revisions to the Order did not introduce new requirements for airport operators, this should provide clarification on the airport operator's current actions working with the FAA technicians.

Please see the referenced enclosed documents:

1. Memorandum on the interim changes to the JO 6750.49B; and
2. Updated Order, JO 6750.49B, Maintenance of Instrument Landing Systems (ILS) Facilities

If you have any questions or require further assistance on this matter, please contact Phil Davenport in the Airport Safety and Operations division, AAS-300 at (202) 267-7072 or email at Philip.Davenport@faa.gov.

Sincerely,

John R. Dermody, P. E.
Director, Office of Airport Safety and Standards

Enclosures

Federal Aviation Administration

Memorandum

Date: OCT 18 2019

To: Airway Transportation System Specialists
Office of Airports (ARP) Regional Directors

From: John R. Dermody, Director, Office of Airport Safety and Standards, AAS-1

Jim Linney, Director, Operations Support, AJW-1

Subject: Interim Changes to Order JO 6750.49B, Maintenance of Instrument Landing System (ILS) Facilities

This memorandum complements a notice of release of interim changes to FAA Order JO 6750.49B, *Maintenance of Instrument Landing System (ILS) Facilities*. These interim changes provide updated guidance on the operation of ILS during snow conditions for the National Airspace System (NAS).

Under the authority of Order 6000.30, NAS Maintenance Policy, and in order to mitigate possible snow impact on the Instrument Landing System (ILS) Localizer signal, the Air Traffic Organization Technical Operations organization (specifically AJW-1) is releasing a Notice to ILS system specialists (N JO 6750.188) that provides a "Localizer Snow Evaluation and Action" procedure. The accumulation of large amounts of snow can change the surface area in front of the Localizer and consequently may affect its radiated signal. This procedure identifies a level of snow accumulation (2 feet) at which point the system specialist needs to start observing the condition of the localizer signal.

This new procedure advises and increases awareness of this possible hazardous condition. The action is to observe and monitor the localizer signal during storm conditions and to correct any variations before it goes out of tolerance. Any mitigation of excessive snow accumulation is a local issue and left to local FAA and airport relationships for coordination.

These changes to the Order are not requiring any additional requirements for the Airport Operator. This memorandum provides suggestions for operations when the interim change goes into effect.

For Airport Operators:

a. Continue to review and/or update local Snow and Ice Control Plans to ensure access roads are accessible by a system operations technician in order to evaluate and mitigate snow or ice accumulation around ILS Localizers and Glide Slope (GS) antennas and associated clearance areas.

b. Review any existing Memorandums of Agreement where the airport has accepted responsibility to mitigate the accumulation of snow or ice around the Localizer or GS antenna and associated clearance areas.

c. Update any notification rosters and methods used to notify a system operations technician when snow or ice accumulation around the Localizer or GS antenna and clearance areas are near or at the critical point.

d. Confirm the issuance of an appropriate NOTAM by the technician when a system operations technician determines snow or ice accumulations jeopardize signal strength from the Localizer or GS antenna.

   (NOTE: For airport-owned ILS components, the airport operator should issue the appropriate NOTAM(s)).

For FAA System Operations Technicians:

a. Keep the Localizer and/or the GS operational during snow and ice conditions to the maximum extent practicable. For facilities not in alarm, the localizer and/or the GS should not be shut off remotely until the system specialist can field-verify that the conditions have jeopardized the signal.

b. If the average snow or ice accumulations in the clearance areas exceed specified limits, follow the guidelines of the Order for Localizer and GS until the conditions change and/or are corrected.

c. Ensure the depth of snowbanks along the edges of the cleared dimensions of the GS snow clearance areas is less than two feet. Additionally, work with the airport operator on snowbank height where clearance requirements for some aircraft or movement areas may dictate lower heights.

d. Review any existing Memorandums of Agreement where the airport has accepted responsibility to mitigate the accumulation of snow or ice around the Localizer or GS antenna and associated clearance areas.

e. Provide current telephone recall information for system operations technicians to the airport operator.
f. When a determination is made that snow or ice accumulations jeopardize signal strength from the Localizer or GS antenna, ensure a NOTAM is issued by the individual with NOTAM authority.

As we update affected guidance documents, some of the content of this memorandum will be included in AC 150-5200-30D, *Airport Field Condition Assessments and Winter Operations Safety*, to reflect the associated interim changes cited in the internal FAA Notice N JO 6750.188, Interim Changes to Order JO 6750.49B, *Maintenance of Instrument Landing System (ILS) Facilities.*

In the interim, please contact; Phillip Davenport at 202-267-7072 or email Phillip.davenport@faa.gov for the Office of Airports; and Tony Delavega at 405-954-3647 or email Tony.delavega@faa.gov for System Operations should you have questions on this subject.

NOTICE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
Air Traffic Organization Policy

N JO 6750.188

Effective Date:
10/18/2019
Cancellation Date:
10/18/2020

SUBJ: Interim Changes to Order JO 6750.49B, Maintenance of Instrument Landing System (ILS) Facilities

1. Purpose of This Notice. This notice releases interim changes to Order JO 6750.49B, Maintenance of Instrument Landing System (ILS) Facilities to reflect the addition of a Snow Evaluation and Action procedure.

2. Audience. This document requires actions by the Airway Transportation System Specialist (ATSS) at operational facilities with Facility, Service, and Equipment Profile (FSEP) equipment: LOC (Web Release Only).

> **Note:** This publication is Web Release Only due to budget constraints. A hard copy will not be distributed but may be printed locally. An electronic copy may be accessed by using one of the options in Paragraph 3, Where Can I Find this Notice, and make copies as necessary.

3. Where Can I Find This Notice?

a. FAA Personnel.

(1) For electronic copies, FAA personnel can use one of the following websites to locate this order.

(a) On the Technical Library website at:
http://nas.amc.faa.gov/phoenix/views/technicalLibrary.xhtml

(b) On the Directives website at:
https://employees.faa.gov/tools_resources/orders_notices/

(c) From the My FAA website, select "Tools and Resources" then select 'Orders and Notices'.

(d) On the National Airspace Systems (NAS) Document Distribution Application (DDA) at http://nas.amc.faa.gov/nasdda/

(e) The ATSS and all administrative personnel must subscribe to the Auto-Notifications Services for electronic library release notifications at https://technet.faa.gov/ Administrative offices can print these documents for local use as required.

Distribution: 14C, 14E, 14H, 14N, NS0
(Web Release Only)

Initiated By: AJW-143

(2) Field offices must keep accurate FSEP records, per Order 6000.5E, Facility, Service, and Equipment Profile (FSEP) and address information for distribution of directives. To update records for:

(a) FSEP, utilize your FSEP contact available at this link: https://employees.faa.gov/org/linebusiness/ato/operations/technical_operations/ajw1/ajw1b/fsep/

(b) Addresses, utilize your Regional Name and Address Coordinator contact available at this link: https://ksn2.faa.gov/arc/aml/Home/lcssportal/LCSSPortalDocuments/NameAndAddressPOCList.pdf

b. Department of Defense (DoD):

(1) All DoD customers must register for an Aeronautical Data Exchange (ADX) website account at https://www.adx.faa.gov. When registering, the user must request access to the NAS Engineering tab of the application. The FAA does not distribute hard copies to DoD customers. For problems accessing the ADX website, contact 9-ACT-ADX-PM@faa.gov

(2) For DoD customers who have questions related to this Notice, contact the Landing Team at (405) 954-8378.

4. Cancellation. Not applicable.

5. Action. Use the interim changes in appendixes of this Notice as temporary guidance to Order JO 6750.49B. Reference the interim changes with the current handbook until the Notice expiration date occurs.

6. Background.

a. Configuration Control Decision (CCD) is pending approval and permanent changes to Order JO 6750.49B, Maintenance of Instrument Landing System (ILS) Facilities will be released in the 3rd quarter of FY 2020.

b. This interim Notice provides guidance to the maintenance specialist who maintains single frequency and dual frequency localizer. If the average snow and ice accumulations in the localizer critical area exceed specified limits per Appendix 1, Table 5-3b of this Notice, follow the table guidelines until the snow depth conditions are corrected by snow removal, or correct themselves through melting or other natural processes.

7. Risks.

a. Operational. In compliance with the latest edition of Order JO 6000.50, National Airspace System (NAS) Integrated Risk Management, specialists should assess local system configuration and maintenance actions using the information, instructions or procedures associated with this Notice for Operational Risk Management (ORM) to the NAS. No known operational risks were identified during the evaluation of the content in this Notice.

b. Safety. In compliance with the latest editions of Orders 1100.161, Air Traffic Safety Oversight, and JO 1000.37, ATO Safety Management System, local safety assessment is required when conducting the maintenance and operations activities contained in this Notice. A National Safety Risk Management (SRM) Report information for this Notice is available at http://nas.amc.faa.gov/phoenix/views/technicalDocument.xhtml?&file=6750_188_n_srmrpt.pdf

c. Security. In compliance with the latest edition of Order 1370.121, FAA Information Security and Privacy Program and Policy, the FAA must ensure that security controls implemented and commensurate with the risk and magnitude of the harm that would result from the loss, misuse, denial of service, unauthorized access, or modification of Federal information assets. No known security risks were identified during the evaluation of the content in this Notice.

for James D. Linney
Director, Operations Support

Appendix 1

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Appendix 1. Interim Changes to JO 6750.49B, ILS Maintenance Handbook

* **1-26. Operation of ILS during Snow Conditions.**

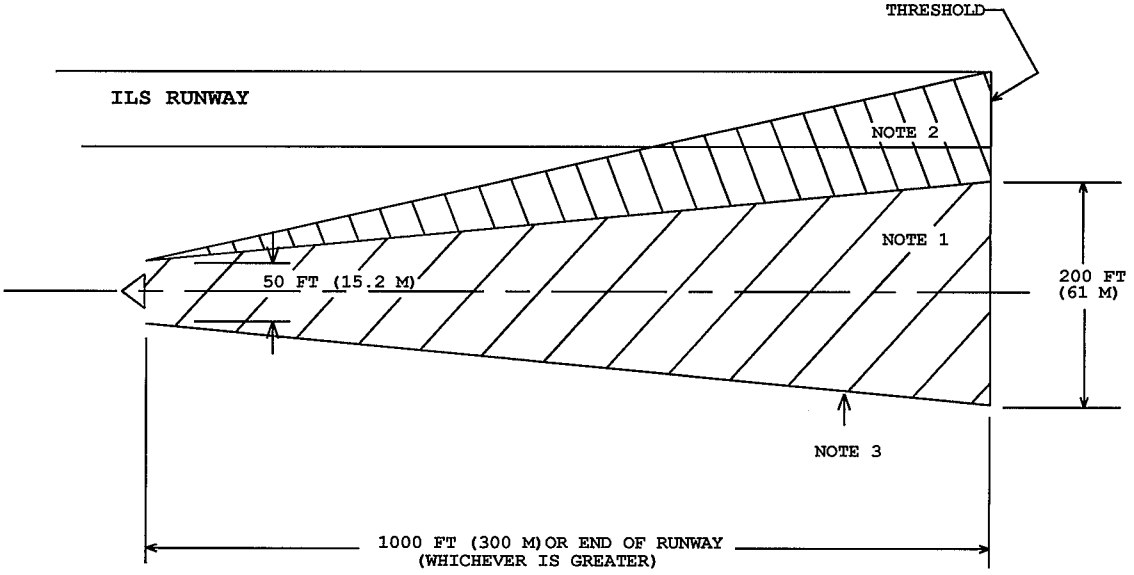
a. Policy. This paragraph provides policy for system specialists who maintain localizers (LOC) and image type null-reference (NR), sideband reference (SBR), and capture-effect (CE) Glide Slopes (GS).

(1) The LOC and/or GS must be kept operational during snow and ice conditions to the maximum extent practicable. However, in no case should a facility be allowed to continue operation with any flight inspection reference exceeded or monitored tolerance in an alarm condition without a special flight inspection certifying proper operation.

(2) (GS ONLY) - Past modifications have provided for full integral monitoring to help keep the GS operational due to apparent shifts in path angle with accumulation of snow in the near field. Heavy snow and icing on the antennas can be problematic to the monitoring system and may warrant the installation of antenna heaters. Due to the various types of systems and locations around the nation, installation and/or operation of GS antenna heaters has been delegated to the service areas.

(3) Refer to paragraph 1-23, Emergency Operation of ILS Facilities.

b. Snow Accumulations. If the average snow and ice accumulations in the critical areas exceed specified limits, follow the guidelines of Table 5-3d for localizer, or Figure 1-1 and Table 5-4 for glide slope, until the conditions revert or are corrected. *



Note 1: Category I GS snow clearance area.

Note 2: Category II and III GS snow clearance area.
The area depicted under Note 1 shall also be cleared.

Note 3: The depth of snowbanks along the edges of the cleared area shall be less than two feet.

Figure 1-1. Glide Slope Snow Clearance Areas

* **c. Pilot Reports.** When notified by a second aircraft that a LOC or GS is malfunctioning, follow the required action in Order 6000.15. *

d. Implementation of Full Integral Monitors. All image-type GS facilities now use full integral monitoring, which is essentially insensitive to snow/ice buildup. Selected GS facilities located in areas that have significant snow/ice accumulations are provided snow depth monitors to alert the system specialist when accumulations approach prescribed limits. Refer to paragraph 5-199 for snow removal policy.

1-27. Configuration Management. All ILS systems are under configuration management control as defined in Order 1800.66, Configuration Management Policy, and NAS-MD-001. Any changes to the baseline configuration or requests for deviation from the National Airspace System (NAS) must go through the NAS change proposal (NCP) process.

1-28. Vehicle Traffic on Airports. All vehicles used in the performance of maintenance duties and operating on any part of an airport shall comply with Order 6000.15, General Maintenance Handbook for NAS Facilities.

1-29. Safety Areas.

a. Frangibility Requirements for ILS Components. The requirements governing frangibility of ILS components are in the Federal Air Regulations (FAR), part 139, paragraph 309(b)(4). This paragraph states, "Each certificate holder must maintain its safety areas as follows: ... (4) No objects may be located in any safety area, except for objects that need to be located in a safety area because of their function. These objects must be constructed, to the extent practical, on frangibly mounted structures of the lowest practical height, with the frangible point no higher than 3 inches above grade." The enforcement and interpretation of this regulation is the responsibility of the Airports Division. The size and location of the safety areas are defined in Advisory Circular AC 150/5300-13, "Airport Design".

b. Safety Areas. The GS is usually outside the runway safety area, which usually extends 250 ft (76 m) each side of runway centerline. The LOC antenna array may or may not be in the runway safety area, which usually extends 1000 ft (300 m) past the stop end of the runway. Antenna systems mounted inside the safety area must be of frangible construction. The actual size of a particular runway safety area is unique to that airport, and no conclusion should be made concerning a specific airport based upon the general statements made in this paragraph.

c. Frangible Antenna Arrays. The log-periodic, traveling wave antenna (TWA), and end-fire antenna arrays are classified as frangible. The V-ring antenna systems have been retrofitted with frangible antenna masts at many locations. The frangibility issue is addressed at the initial installation of an ILS on any airport by the engineer responsible for the siting of the ILS. After installation and facility commissioning it is the responsibility of the FAA system specialist to promptly report any non-frangible structures associated with the ILS that are installed within the airport safety areas.

Chapter 5. Maintenance Procedures

Section 3. Special Maintenance Procedures (Continued)

Subsection 2. Localizers (Continued)

* **5-176. Localizer Snow Evaluation and Action**

a. Object. This procedure provides guidance to the system specialist for various snow and ice conditions.

b. Discussion.

(1) Signal samples used to analyze and control operation are obtained and processed to provide an indication of what the airborne user is receiving. Monitoring signals in lieu of actual far-field signals are obtained from integral samples. The integral monitor sample and far-field indication are essentially unaffected by small amounts of snow accumulation. When snow accumulation reaches a particular depth described in Table 5-3d, Localizer Snow Depth, the action described for that snow depth shall be taken. Upon subsequent snow events, reevaluation is required.

(2) System specialists are required to visually scrutinize the LOC critical area, and take action to remove any existing problems. There is no substitute for the specialist's skills in observation and analysis of the LOC critical area for snow/ice depths, drifts, piling, or obstruction to signals, and exercising prudent judgments regarding requisite action.

(3) When evaluating localizer snow accumulation, special attention should be given to changes in the lateral slope of the terrain between the localizer and the stop end of the runway. That is, if the lateral terrain slopes and the snow tends to level it or conversely, if the terrain is flat and the snow tends to create a slope. Changes in this lateral slope tend to push the centerline null, intensifying the snow effect.

c. Test Equipment Required.

(1) A yardstick or other means of measuring snow depth.

(2) A means of permanently marking the ground check points.

d. Detailed Procedure.

(1) Follow the guidance listed in Table 5-3d for snow depths. Visually inspect the LOC critical area. Determine the snow depth by visually averaging peaks and valleys, the use of a physical probing, maybe necessary.

(2) The depth of snowbanks along the edges of the clearance area must not exceed 2 feet (0.6m). If there is a need for the system specialist to mitigate snow accumulations, coordinate with the airport operator to ensure any removal of snow or modifications to the snow covered surface by the system specialist does not negatively impact airport safety. The following features may exist within the ILS clearance areas: Runway and taxiway safety areas, taxiway object free areas, or clearance for aircraft operations (for example: wing-tip / engine clearance may dictate lower heights). The dimensions of these areas can vary from runway to runway and taxiway to taxiway. *

* Additionally, at some airports Engineered Materials Arresting Systems (EMAS) may be installed at the end of a runway(s), possibly within the Localizer Critical Area. These systems are intended to capture an aircraft during an excursion and therefore cannot support the weight of a vehicle or most equipment without causing damage. Coordination with the airport operator is necessary to access and/or modify snow accumulations on these surfaces

Table 5-3d. Localizer Snow Depth

< 24 in (60 cm)	≥24 in (60 cm)
	All ILS Categories
Technician evaluate for proper action per paragraph 5-176. Restore full service and category. Reevaluate upon subsequent snow events.	**Facilities with Far Field Monitors (FFM)** remain in service as long as the FFM is not in alarm. **Facilities without Far Field Monitors (FFM)** verify the signal with a normal ground check. Contact Service Area Operations Engineering Support Group (OESG) prior to removing from service. Reevaluate upon subsequent snow events.

5-177. thru 5-189. Reserved. *

U.S. Department
of Transportation
Federal Aviation
Administration

Advisory Circular

Subject: Airport Field Condition Assessments and Winter Operations Safety

Date: DRAFT **AC No:** 150/5200-30D
Initiated By: AAS-300 **Change:** 2

1 **PURPOSE.**

This advisory circular (AC) change is based on the inclusion of additional language and guidance to airport operators on snow removal around airports NAVAIDs and on when to issue new runway condition reports.

2 **APPLICATION.**

The information contained in this AC provides guidance for the airport operators in the development of plans, methods, and procedures for identifying, reporting, and removal of airport contaminants. The use of this guidance is an acceptable means of compliance, for airports certificated under Title 14 Code of Federal Regulations (CFR) part 139, Certification of Airports. The use of this AC is also a method of compliance for federally obligated airports. Furthermore, use of the specifications in this AC is mandatory for projects funded under the Airport Improvement Program (AIP) or with revenue from the Passenger Facility Charge (PFC) program.

3 **PRINCIPAL CHANGES.**

This AC change includes the following principal changes:

1. For paragraph 4.2.2.1, adds new note related to challenges of managing and monitoring more than one runway during winter operations.
2. For paragraph 4.2.2.4.1, adds additional language on the effect of snow accumulation around the localizer.
3. For paragraph 4.2.3.1, adds language about the need for coordination to assess snow accumulations for EMAS within the Localizer critical area.
4. For paragraph 5.7.2.2.1, adds additional language on changes that may generate updated surface condition reports.

5. For paragraph 5.7.2.2.2, adds new paragraph and note addressing condition reports that remain unchanged for an extended period.

John R. Dermody
Director of Airport Safety and Standards

3. Regarding the use of displacement plows, ice and snow will always melt around runway centerline and touchdown zone light assemblies. However, under cold temperature and with LED fixtures, ice rings, termed "igloos," tend to form around them. In order to prevent damage to lights, use appropriate polyurethane cutting edges or shoes and casters on plow moldboards and on the front of rotary plows.

4. Rotary plows should throw snow a sufficient distance from runways/taxiways edges so adequate clearance is available between airplane wings and engine nacelles and the cast snow banks. Figure 4-1 shows desired maximum snow height profiles, which are based on airplane design groups.

Note: When conditions make it challenging to effectively manage and monitor more than one runway, airports with multiple runways should focus their efforts on the primary runway and taxi routes and initiate closures on any surface that cannot be safely maintained or monitored. As a best practice, many airports pre-emptively initiate closures at the onset of a known problematic weather event, allowing for the effective management of those areas that will remain available for air carrier use. At high traffic airports, this is accomplished in coordination with air traffic and local stakeholders to minimize impacts.

4.2.2.2 All drivers must maintain a safe distance between equipment operating in echelon (i.e., V-formation, close wing formation) in order to avoid accidental contact or accidents (see Figure 4-3, Figure 4-4, and Figure 4-5).

4.2.2.3 Obscured visual aids—in particular, in-pavement and edge lights, taxiway markings, runway markings (such as touchdown marking), airport guidance signs, and runway end identification lights (REIL), precision approach path indicator (PAPI) or visual approach slope indicator (VASI)—should be maintained free of snow and ice.

4.2.2.4 A covering of snow and ice or drifts may affect visual and electronic NAVAIDs. Any snow or ice that affects the signal of electronic NAVAIDs should be removed. When clearing with rotary plows and displacement plows, special procedures need to take into account the location of all NAVAIDs, especially to protect the guidance signal of instrument landing systems (ILS). The SICP needs to address the following situations:

4.2.2.4.1 Glide slope critical ground areas along the runway require that snow depths be limited in height to prevent signal loss or scattering. The accumulation of large amounts of snow can change the surface area in front of the Localizer and consequently may affect its radiated signal. A snow accumulation level of two (2) feet is the limit at which point the system specialist needs to start observing the condition of the Localizer signal. The depth of any snowbanks along the edges of the cleared dimensions of the GS snow clearance areas may have to be mitigated to less than two (2) feet where clearance requirements for some aircraft or movement areas my dictate

lower heights. Figure 4-2 provides graphic representations of the glide slope ground snow clearance areas with prescribed snow depth limitations according to type of facility and aircraft approach category. When snow depths exceed the specified depth limitations, minima are raised to the "localizer only" function until the conditions revert or are corrected.

Note: There is no substitute for the specialist's skill in observation and analysis of the LOC critical area for snow/ice depths, drifts, piling, or obstruction to signals, and exercising prudent judgements regarding requisite action. When a determination is made that snow or ice accumulations jeopardize signal strength from the Localizer or GS antenna, ensure a NOTAM is issued by the individual with NOTAM authority.

4.2.2.4.2 Two consecutive pilot reports of glide slope signal malfunctions generally result in raised minima (a NOTAM must be issued by the owner of the NAVAID). A few additional points should be considered:

- The 200-foot width dimension adjacent to the threshold might be wider for an antenna mast placed further out (see FAA Order 6750.49, *Maintenance of Instrument Landing System (ILS) Facilities).*
- The snow clearance areas illustrated in the figures are minimal in size.
- Snow clearing activities should not allow snow banks, mounds, or ridges exceeding 2 feet to be placed along the edges of the prescribed snow clearance areas.
- Snow banks should not be placed off the approach ends of runways, especially for CAT II/III operations.

Note: Snow banking operations need to take into account the guidance in Figure 4-1.

4.2.2.4.3 Visibility of signs (legibility) and lights should be maintained by certain prescribed clearing techniques or by performing post-clearing maintenance. Maintaining visibility can be better achieved by taking into account wind directions. For example, in crosswind conditions, cast in the downwind direction. Figure 4-3 through Figure 4-5 provide general guidance.

4.2.2.4.4 The snow depth height limitations noted in Figure 4-1 do not take into consideration airplane characteristics. That is, at some airports, airplane characteristics, such as engine clearances, may dictate lower snow banks than shown in Figure 4-2. The objective here is prevention by avoiding the introduction of hazardous snow banks, drifts, windrows, and ice ridges that could come into contact with any portion of the airplane wing or nacelle surface.

4.2.2.5 If the airport's operation involves the use of snow banks, their height profiles should be compatible with NAVAID ground requirements and offer sufficient clearance between airplane wings and engine nacelles to avoid

to determine what types of equipment are compatible with the EMAS bed and recommended clearing procedures and/or limitations. Any EMAS that may exists within the Localizer critical areas will require coordination with NAVAID system operators to help assess the snow accumulation on these surface to ensure the radiated signal is not affected. See AC 150/5220-22, *Engineered Materials Arresting Systems (EMAS) for Aircraft Overruns,* for additional guidance.

4.2.3.2 Identify compatible deicing agents and the equipment, tools, or process for application.

assessment applies to the entire runway and can be read in reverse by pilots, the airport, air traffic, and other users. The associated thirds do not change if reported in reverse. This format will allow a pilot to identify where contaminants are located on a runway and where the biggest impact to friction may exist. Reporting from both ends of the same runway may cause confusion to pilots by advertising two sets of Runway Condition Codes for the same surface. This redundancy also unnecessarily clutters the NOTAM system which also adversely affects pilots. Do not report depths for compacted snow and ice. When reporting depth for standing water or slush, the depths are either 1/8 inch (3 mm) or less or greater than 1/8 inch (3 mm). When the cleared runway width is less than the full runway width, also report the conditions on the uncleared width (runway edges) if different from the cleared width. When the RCAM is properly utilized, specific runway condition codes will be generated for contaminants present based on the identified contaminant list in AC 150/5200-28 and FAA Order JO 7930.2. In the event the full width of the runway is not cleared, the runway condition code will be generated based on the contaminants present in the cleared portion of the runway (typically center 100 feet). Additionally, the airport operator must keep in mind that the entire width of the runway is still usable and available to the aircraft and must be safely maintained. This means that while contaminant depths may vary from the center cleared portion to the remaining portions or edges of the runway, the condition of the outlying portions must not present an operational hazard.

5.7.2.2 **When to Issue New Runway Condition Reports.**

5.7.2.2.1 Runway condition reports must be updated any time a change to the runway surface condition occurs. Changes that initiate updated reports include weather events, the application of chemicals or sand, or plowing or sweeping operations. Airport operators should not allow airplane operations on runways after such activities until a new runway condition assessment has been completed identifying the changed condition(s) and the effectiveness of mitigations and treatments and ensuring no new hazards have been inadvertently introduced. This assessment should be reported via the NOTAM system, reflecting the current surface condition(s) of affected runways.

1. At certificated airports, such changes to the runway surface condition must be updated and appropriately disseminated to airplane operators so they are aware of the current conditions before continuing with their operations. During active snow events or rapidly changing conditions (e.g., increasing snowfall, rapidly rising or falling temperatures), airport operators should maintain a vigilant runway inspection process to ensure accurate runway condition reports. During these types of events, an airport operator's active snow and ice control activities may allow the airport to maintain the previously reported runway conditions for extended periods during an event. In this case, the airport can continue

to use the existing runway condition report (NOTAM), so long as the condition can be maintained. If the runway contamination type changes or the depth exceeds the previously reported condition, a new runway condition report should be issued.

2. Although a runway condition report (NOTAM) may be accurate for several hours at a time, it is advisable to update the runway condition report (NOTAM) times more frequently, to avoid giving the impression of outdated information. Updating this information routinely will also reduce the number of inquiries from aircraft operators. While pilot braking action reports provide valuable information, these reports may not apply to the full length of the runway as such evaluations are limited to the specific sections of the runway surface in which the airplane wheel braking was used. In addition, runway condition reports should be updated at least at the beginning of each shift of operational personnel, when conditions are not changing but contaminants are present (e.g., following a snow event where frozen contaminants remain after an airport's mitigating actions).

5.7.2.2.2 When runway conditions reports have not changed between assessments and an extended period of time has elapsed between reported conditions, it is recommended that the current NOTAM also be updated, since each report will reflect the time of observation. This will serve as an indication to pilots of the airport's continual monitoring and/or snow removal efforts. Airport operators should maintain a vigilant runway monitoring regiment to ensure accurate runway condition reports are provided to airport users as long as the runway remains open.

Note: When reporting updated runway conditions via the NOTAM system, an airport operator should also communicate this information to its users via all available means (ATCT, TRACON, and ARTCC, CTAF, and other established local communication methods) to ensure that aircraft in close proximity to the airport have the most current conditions report available. There are times when an inbound aircraft or an aircraft ready to depart may not have the benefit of the latest condition report if conditions have changed from those used to conduct initial flight planning.

5.7.2.2.3 Whenever any of the previously identified circumstances apply, the airport operators can use mitigation to improve runway conditions, which in turn may lead to a higher RwyCC. For example, on first assessment of the runway conditions, an airport operator may determine the identified contaminants generate an RwyCC of "0". A RwyCC of "0" is equivalent to Nil braking conditions, which requires the runway be closed until mitigation actions are performed and the unsafe conditions no longer exist. After the mitigation actions are completed, the airport operator would reassess the

runway conditions and determine whether a different runway condition applies. Based on the contaminants *now* present (type, depth, and percentage), the runway condition code may change or no longer be reported if the amount of contamination is 25% or less of the overall runway length and width or cleared width (if not cleared from edge to edge). This process differs from the upgrade process, which is based on improvement of friction within the existing contaminants versus the mitigation or removal of those contaminants (see paragraph 5.4.3.2).

5.8 Requirements for Runway, Taxiway, and Apron and Holding Bay Closures.

5.8.1 The previously accepted philosophy of the aviation industry was that the airport operator was obligated to provide an accurate description of the surface conditions, and it was solely up to the pilot to decide if a surface was safe for use. Accident data do not support such a philosophy, and the FAA has determined that operations on surfaces reported as having NIL braking are inherently unsafe. Admittedly, this is a conservative approach considering the variation in pilot braking action reporting. The NOTAM system does not accept a NIL braking action report, and if attempted, prompts the airport operator to close the surface and perform mitigating actions until the unsafe condition no longer exists.

Note: To clarify, the FAA has determined that a NIL condition (i.e., minimal or non-existent braking condition) is an unsafe condition. The NOTAM system does not accept a NIL braking action report, and if attempted, prompts the airport operator to close the surface and perform mitigating actions until the unsafe condition no longer exists.

5.8.2 Certificated and obligated airports are required to maintain available airport surfaces in a safe operating condition at all times and to provide prompt notification when areas normally available are less than satisfactorily cleared for safe operations. To that end, at a minimum, the following circumstances require action by the airport operator:

5.8.2.1 **Runways**.

5.8.2.1.1 A NIL pilot braking action report (PIREP), or NIL braking action assessment by the airport operator, indicates a potentially unsafe condition. An acceptable action is for the airport operator to promptly close the particular surface prior to the next flight operation (and NOTAM that closure) until it is satisfied that the NIL condition no longer exists.

5.8.2.1.2 When previous PIREPs have indicated GOOD or MEDIUM braking action, two consecutive POOR PIREPs indicates that surface conditions may be deteriorating. An acceptable action is for the airport operator to conduct a runway assessment prior to the next operation (unless the airport operator has instituted its continuous monitoring procedures described in paragraph 5.9). If the airport operator is already continuously monitoring runway

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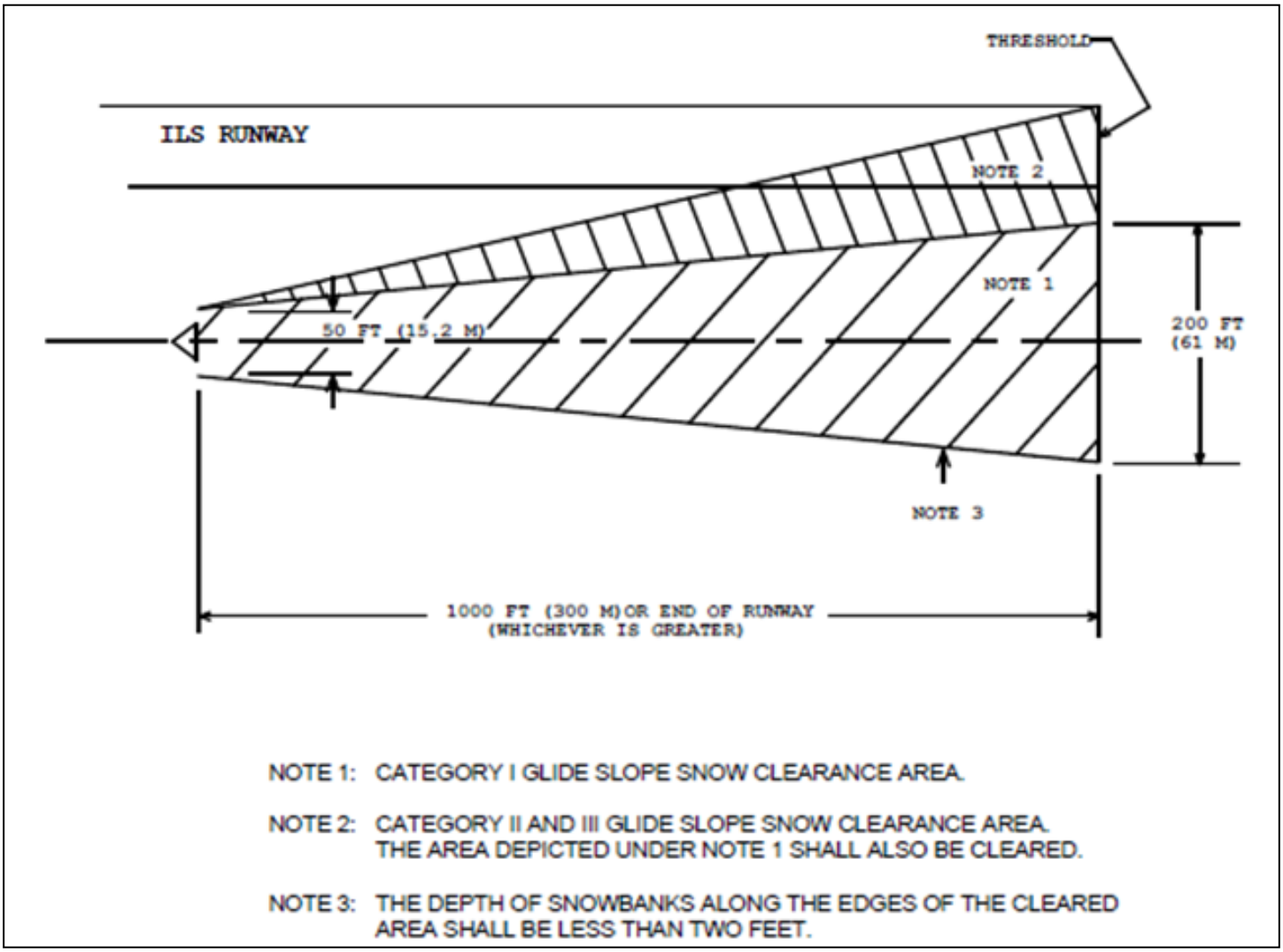
Snow Removal Clarification for ILS Facilities

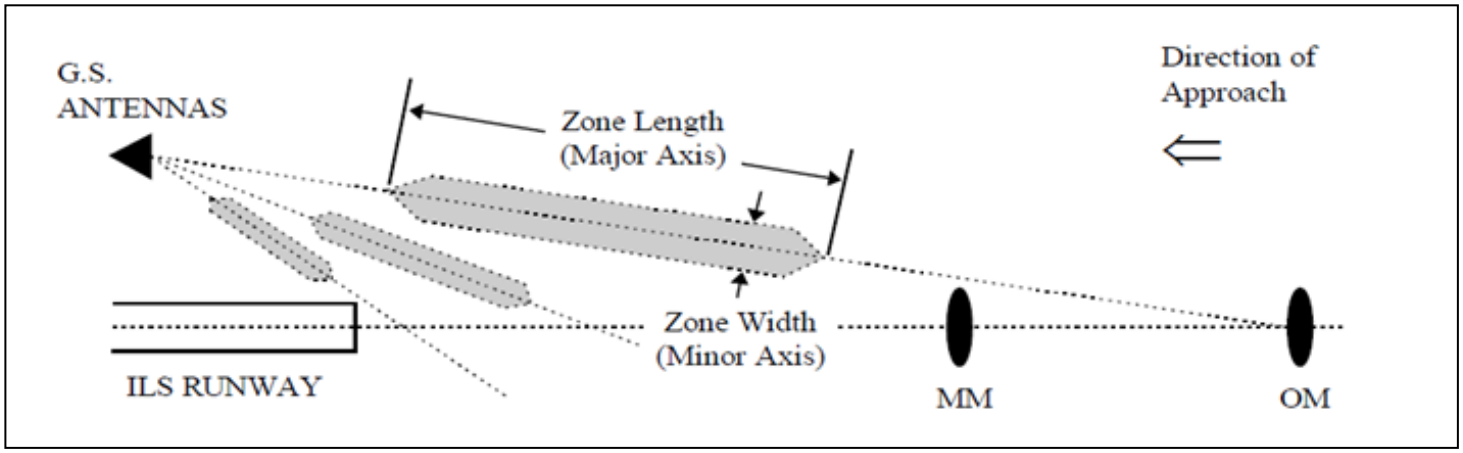
Glide Slope:

6750.49A, Maintenance of ILS Facilities, Figure 1-1 outlines two areas for snow removal for Glide Slope facilities. Note the snow clearance areas differ for CAT I operations versus CAT II/III operations.



6750.49A Figure 1-1. Glide Slope Snow Clearance Areas

6750.16E, Siting Criteria for ILS, Figure 3-2 illustrates that the major axis of the First Fresnel Zone for the Glide Slope lies on a line between the glide slope mast and the aircraft position.



6750.16E Figure 3-2

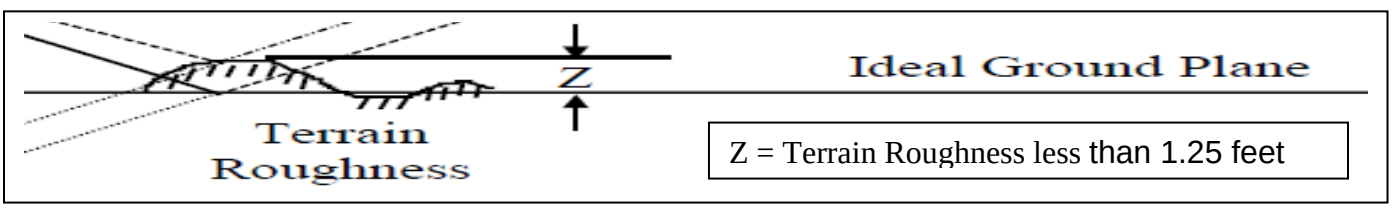
Note: A Fresnel zone is a series of concentric ellipsoidal regions of alternating double strength and half strength volumes of a wave's propagation, caused by a wave following multiple paths as it passes by an object and is partially refracted by it, resulting in constructive and destructive interference as the different length paths go in and out of phase.

As the approaching aircraft gets closer to the end of the runway the Fresnel Zone gets shorter, narrower and rotates toward the runway. Note the diagram is illustrative and not to scale.

There is a different snow removal area for CAT II/III versus CAT I because the aircraft minima are closer to the runway than for CAT I. Therefore the Fresnel Zone gets closer to the glide slope and more rotated. The snow clear area must roughly capture the area on the ground the Fresnel Zone covers for the closest distance required by the category of approach. The closer the aircraft is to threshold the more demanding the snow clear area.

Given that the cleared areas in Figure 1-1 provide sufficient coverage of the Fresnel Zones for the required categories of operation, see Note 3 in Figure 1-1: "The depth of snow banks **along the edges of the cleared area** shall be less than two feet." This means just that. The edges of the cleared area must be less than two feet. It is recommended that the area 10 – 20 feet beyond this edge be tapered off (i.e. in this 10 – 20 foot area beyond the edge there should be no snow banks or drifts greater than two feet). Areas beyond this will not contain a significant portion of the Fresnel Zone and need not be cleared to the two foot limitation.

When considering the extent to which the cleared area must be smooth, 6750.16E, Appendix 3, Paragraph 2. Criterion for Terrain Roughness provides some guidance. Although the mathematics are quite daunting, the bottom line is that for a three degree glide slope the allowed roughness is 1.25 feet in the cleared area. Remember to refer to 6750.49A, table 5-4 for the smooth snow accumulation height levels before attempting snow clearing operations. If the minima restrictions for certain heights of snow and types of glide slope are acceptable in your particular situation, a better plan might be to accept the restrictions for no snow removal.



LOCALIZER:

Localizer snow effects are not as dubious as those experienced with a glide slope because of the ability to take ground check readings. Any concerns regarding how much snow is too much snow can be easily determined by comparing a ground check to the tolerances. A complete ground check should be used to evaluate snow effects on course, width, and clearance portions of the pattern. Decisions can then be made about the extent of snow clearing that may be required.

6750.49A does not provide guidance on snow effects for localizer facilities. However, that does not mean that localizer facilities are immune to the effects of snow. The following excerpts from Paragraph 1-22 provide some basic information that can be built upon for snow clearance guidance.

"Paragraph 1-22 a. (3) (a) Environmental changes in areas beyond…35 degrees localizer (LOC) azimuthal degrees from the course or path line rarely effect user indications."

"Paragraph 1-22. a. (3) (d) Changes in ground contour of 1 ft. (30 cm) or more within the defined critical area of the localizer…are of concern, more so if within…1000ft (300m) of the localizer antenna arrays."

Given the above, the area to look for snow issues can be focused on the area within 1000 ft. of the localizer array, within 35 degrees azimuth of course, and greater than 1 foot in height. This would be the area where snow clearing and snow bank removal should take place. The 1 foot ground contour is not a hard tolerance but rather a guideline for beginning "concern" over terrain, in this case snow effects. As referenced above, a ground check should be completed to determine actual effects on the radiated signal.

In a similar manner to the glide slope criteria the depth of snow banks along the edges of any cleared area should be less than two feet. It is recommended that the area 10 – 20 feet beyond this edge be tapered off (i.e. in this 10 – 20 foot area beyond the edge there should be no snow banks or drifts greater than two feet). Note that depending on the backset of the localizer the cleared area may encompass a portion of the runway edge.

Many localizers have smooth graded terrain between the array and the stop end of the runway. This provides the best immunity to snow effects because changes in the lateral terrain slope in front of the localizer tend to shift the course. Evenly falling snow on an already smooth and symmetrical terrain surface will cause very little apparent terrain slope change and should have little effect on the course. Drifting and wind-blown snow can tend to change this apparent slope in a random fashion as it accumulates asymmetrically on the surface of the ground.

Lateral terrain refers to the terrain in front of the localizer and left and right of the extended runway centerline. Terrains which are asymmetrical about this extended centerline in front of the localizer (i.e. higher on one side than the other) are most problematic.

Here are a few examples in which snow may shift the localizer course.

- A localizer has existing terrain which is asymmetrical about the extended runway centerline in front of it. A wind and snowfall pattern causes heavy snow to collect primarily on the low side of this asymmetrical terrain, causing the apparent terrain (now the surface of the snow) as seen by the localizer to appear more symmetrical. A course shift may occur.

- A localizer has existing smooth and symmetrical terrain in front of it for 1000 feet along extended runway centerline. A wind and snowfall pattern causes heavy snow to form a large drift on one side of the centerline extended in front of the localizer causing the apparent terrain as seen by the localizer to seem more asymmetrical. A course shift may occur.