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A Communication from the
Vice President, Mission Support Services

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Winter Operations

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***TRFE** During typical winter operations, such as snow removal, there is a need for extra caution. The potential for danger must be recognized, and the need for positive control cannot be overemphasized. Those involved in snow removal may be unaware of certain hazards inherent to airport operations. The following suggestions are recommended during winter operations:

- Keep in mind that visibility from the tower may be different from that of the snow removal crew. Removal operations such as plowing, sweeping, and snow blowing can reduce visibility to near zero in the immediate area. Ensure that any visual reference used in instructions is something that can be seen by everyone involved. Also ensure that you and the equipment operators are using the same references.

- Remember the noise level inside a snow removal machine may be high. Ensure your microphone technique and voice quality enhances positive communications.

- Runway contaminants, such as snow and ice, can make the surface slippery. An additional margin of safety is provided by giving equipment operators sufficient time to comply with instructions.

- Review the winter operations plan, normally contained in facility directives.

- Know the provisions of FAA Order JO 7110.65, Chapter 3, Section 3, Airport Conditions, which contains procedures applicable to ground operations.

Winter Operations and Runway Incursions

Several factors that occur during winter months require our attention to reduce runway incursions further. Keep the following factors in mind:

- Snow removal and vehicle operations on the runways and other movement areas.
- Aircraft taxiing slower because of surface conditions.
- Aircraft require more time to exit or cross runways because of surface conditions.
- Various forms of precipitation reduce controller and pilot visibility.
- Plowed snow and snowdrifts cause blind spots and potential uncertainty regarding location, for taxiing aircraft.
- Bright sunlight reflects off surface snow and ice, causing glare and reducing pilot visibility.

U.S. NOTAM Policy Transition

The FAA is currently transitioning into a NOTAM policy that is more in line with the International Civil Aviation Organization (ICAO) standards, which will enhance a more global consistency. Software changes are being made to the United

States NOTAM System (USNS) to enable a smoother transition to these new policies and procedures. These changes to the USNS were implemented by the following Notices to FAA Order JO 7930.2M, Notices to Airmen, for implementation November 14, 2011:

N JO 7930.93, Reporting of Field Conditions (FICON)

The use of FICON will allow pilots and dispatchers to easily sort and recognize NOTAMs with reported field conditions. FICON NOTAMs are used to report surface contaminants on runways, taxiways, and aprons/ramps. FICON will be inserted after the surface designator(s) and before the field condition(s): snow, ice, slush, water, drifting/drifted snow, plowed, swept, sanded, deiced, snowbanks, mud, frost, frost heave, ruts, and soft edge.

Example:
!MEM MEM APRON FEDEX FEEDER RAMP FICON 1/2 IN LOOSE SN WEF 1112292345

N JO 7930.94, Use of "Work In Progress" in Notices to Airmen (NOTAM)

FAA Part 139 Cert, Alert No. 11-03, replaced the phrase "Personnel and Equipment Working (PAEW)" with "Work in Progress". Any NOTAM associated with work in progress on or adjacent to a runway, taxiway, apron/ramp, or aerodrome must begin with one of the following keywords: RWY, TWY, APRON, or AD.

Example:
!SBY SBY TWY E BTN RWY 5/23 AND TWY A WORK IN PROGRESS TRENCHING SOUTH SIDE

Planning

Good planning goes a long way to ensure safe and efficient air traffic operations during winter weather. Now is the time to review and update all local directives specifically relating to winter operations. Ensure contact information and procedures for coordination with airport operators are updated. If possible, facilities should work with airport management to ensure that ground operators, particularly infrequent operators, are aware of local procedures, communications with tower positions, and reporting of runway conditions.

Facility managers should participate on airport committees engaged in planning for winter airport operations, however, in an advisory capacity only. The FAA is not the decision maker on runway conditions or airport closures due to weather. Airport management makes these decisions.

Where appropriate, managers should discuss gate hold procedures that may be implemented during the winter, including local deicing plans. Ensure a clear understanding of how and when these procedures apply.

Advisory Circular 00-6A, Aviation Weather for Pilots and Flight Operations Personnel, has been around since 1975 under its present title, and dates back to 1943 under other titles. However, it still remains an excellent source of information on winter weather and hazards.

Tarmac Delays

The Department of Transportation (DOT) rule-setting penalties for U.S. airlines that delay domestic flights on the ground for more than three hours was implemented on April 29, 2010. The rule does not permit domestic airlines to remain on the tarmac at U.S. airports for more than three hours without allowing passengers to deplane, except for reasons of safety or security, or if air traffic control determines that returning to the terminal would disrupt airport operations.

In August of 2011, a new DOT rule was implemented that added a four-hour tarmac restriction to international flights for both domestic and international carriers. This rule includes a provision that does not permit U.S. and foreign air carrier's international flights to remain on the tarmac at a U.S. airport for more than four hours without allowing passengers to deplane. This provision is subject to safety, security, and air traffic control (ATC) exceptions. Additionally, covered carriers must report all passenger operations that experience a tarmac time of three hours or more at a U.S. airport. The three-hour tarmac rule for domestic air carrier flights remains in effect; however, it expands airport contingency plan requirements to additional airports other than those previously designated as "medium" and "large" hubs.

Severe winter weather can contribute to long tarmac delays. Often departures are held due to deicing, severe weather, and/or airport conditions, etc., either at their proposed destination, departure airport, or en-route. Occasionally, arrival aircraft, or aircraft returning to the ramp, due to tarmac delays, are unable to get to their gate due to airport conditions, congestion, gate availability, etc.

Pilots are responsible for notifying the local ATC facility that action is requested to comply with the three/four-hour tarmac rule. The request should be made in a timely manner to ensure compliance with the rule and reflect local operating conditions, such as available taxiways or other aircraft movements. The request for action or clearance from the pilot-in-command (PIC) to ATC should include, for example, "tarmac-related delay," and the time by which the aircraft must be airborne or to deplane passengers. It is ATC's responsibility to provide the requested service as soon as operationally practicable, or to advise the PIC that the requested service cannot be accommodated because it would create a significant disruption of ATC operations.

This new rule prompted additional guidance for ATC facilities to update procedures for handling requests related to tarmac delays and to ensure those procedures are briefed annually. While it is not ATC's responsibility to dynamically track the time individual flights are delayed, we need to be responsive to requests of the PIC. Additionally, when an ATC facility is notified, suspects, or becomes aware that an aircraft exceeded the three/four-hour tarmac rule, they are required to retain all available data pertinent to that aircraft in accordance with FAA Order JO 8020.16.

Icing Conditions

Aircraft icing is a significant hazard and warrants extra attention during the winter. Ice, including frost, can be a hazard because of the way it affects airframes and power plants. Accumulation of ice on the outside of aircraft impairs wing lift and propeller thrust, while it simultaneously increases weight and drag. Ice can reduce engine performance to dangerous levels. In the most severe case, it can cause engine failure.

The categories of icing intensity are as follows, per the Aeronautical Information Manual, 7-1-21:

1. **Trace.** Ice becomes perceptible. Rate of accumulation slightly greater than sublimation. Deicing/anti-icing equipment is not utilized unless encountered for an extended period of time (over one hour.)
2. **Light**. The rate of accumulation may create a problem if flight is prolonged in this environment (over one hour.) Occasional use of deicing/anti-icing equipment removes/prevents accumulation. It does not present a problem if the deicing/anti-icing equipment is used.
3. **Moderate.** The rate of accumulation is such that even short encounters become potentially hazardous and use of deicing/anti-icing equipment or flight diversion is necessary.
4. **Severe.** The rate of accumulation is such that deicing/anti-icing equipment fails to reduce or control the hazard. Immediate flight diversion is necessary.

There are several forecasts that contain warnings of icing. Pilot weather reports (PIREP) are the only source of real-time icing information. This information provides the controller with a tool that could help prevent a life-threatening situation. Because of their importance, procedures for soliciting and relaying PIREPs are contained in FAA Order JO 7110.65, Paragraph 2-6-3, PIREP Information, and FAA Order JO 7110.10, Paragraphs 9-2-5, Soliciting PIREPs; 9-2-7, Data to be Included in PIREPs; 9-2-9, Reporting Icing Conditions in PIREPs; 9-2-10, Means to Solicit PIREPs; 9-2-11, PIREP Classification; and 9-2-15, PIREP Format, specifically subparagraph k. The paragraphs of these directives contain important information on PIREP solicitation, briefing, broadcast, and handling procedures.

Portions of the Code of Federal Regulations, parts 91 and 135, prohibit flight into areas of known icing under some conditions. In addition, some aircraft are extremely sensitive to airframe icing of any degree. Therefore, it is vitally impor-

tant that all icing reports from pilots be processed following established procedures. Soliciting and relaying all icing PIREPs, light or greater, is required. When icing conditions are forecasted, it is as important to pass negative icing reports as it is to pass those of actual current icing. Both are of great value.

Now is a good time for operational personnel to review PIREP procedures. Always include the location, altitude or range of altitudes, type aircraft, air temperature, intensity, and type of icing occurring when obtaining or providing these PIREPs. This information is not only helpful to pilots on a real-time basis, but is invaluable in formulating and updating aviation forecasts.

You Really Need to Know

Aircraft icing can occur either in the air or on the ground. A common condition for icing is when an aircraft taxis through slush or water at or near freezing. It can also occur when aircraft fly through precipitation and the air temperature is near or below freezing. The most severe icing occurs with a free air temperature between 0 and minus 10 degrees Celsius. However, icing is not uncommon at much colder temperatures, and may occur down to minus 40 degrees Celsius.

Cumuliform clouds are more likely to produce serious ice formation than other clouds, particularly if freezing rain is present. However, at altitudes above the freezing level, any layer of air with a narrow temperature dew point spread is a potential icing zone. Ice can form by sublimation, water going directly from a gaseous state to a solid state, which in this case changes directly from water vapor (always present in the atmosphere) to solid ice. Aircraft icing includes clear, rime, and mixed types.

Clear Ice

Clear ice forms when the remaining liquid portion of the water drops flow out over the aircraft surface, gradually freezing as a smooth sheet of solid ice. Formation occurs when droplets are large as in rain or in cumuliform clouds. Clear ice is hard, heavy, and tenacious. Its removal by deicing equipment is especially difficult.

Rime Ice

Rime ice forms when water drops are small, such as those in stratified clouds or light drizzle. The liquid portion remaining after initial impact freezes rapidly before the drop has time to spread over the aircraft surface. The small frozen droplets trap air giving the ice a white appearance. Rime ice is lighter in weight than clear ice, and its weight is of little significance. However, its irregular shape and rough surface decreases the effectiveness and efficiency of the aerodynamic properties of airfoils, thus reducing lift and increasing drag. Rime ice is brittle and more easily removed than clear ice.

Mixed Clear and Rime Icing

Mixed clear and rime icing can form rapidly when water drops vary in size or when liquid drops intermingle with snow or ice particles. Ice particles become imbedded in clear ice, building a very rough accumulation sometimes in a mushroom shape on leading edges.

Points to Remember

Air traffic personnel should be alert to icing-related problems that include intermittent and sometimes total loss of communications. Aircraft antennae can become ice coated, causing reduced capability to transmit and/or receive. Similar communication issues can occur when the antennae for ground equipment accumulates ice after a period of freezing rain or mixed precipitation. Another concern is false flight instrument indications that may be caused by pitot tube icing. If an aircraft climb rate seems abnormally high, you may want the aircraft to verify the Mode C readout.

Weather-related information such as PIREPs, significant meteorological information (SIGMET), meteorological impact statements (MIS), center weather advisories (CWA), airmen's meteorological information (AIRMET), and other advisories always require special attention and handling.

Base your advice to pilots concerning icing on forecasts and PIREPs. Forecasts delineate general areas of icing potential, and do not identify the type of icing forecast. Forecasts only forecast moderate

and severe intensity- not trace or light. PIREPs pinpoint actual encounters. In using PIREPs, there may be discrepancies in the type or intensity reported. The rate or impact of ice accumulation may vary on different types of aircraft. Piecing together several reports can provide a more comprehensive picture of icing potential.

An area forecast always contains a section on icing. It specifies freezing levels, expected changes in freezing levels, and altitudes where icing is most likely to occur. Significant meteorological and airman's meteorological information are also excellent sources of icing information.

Forecasting the Icing Hazard

What do meteorologists look at when trying to determine if an icing hazard exists? How do they determine where the hazard will be during the valid time of the upcoming area aviation forecast?

Basically, National Aviation Weather Advisory Unit's meteorologists try to determine where there will be enough moisture to form clouds above the freezing level. If they look at the moisture too far above the freezing level, they find they are tracking ice crystals instead of liquid water droplets. That brings up an important question. Why is there liquid water above the freezing level? Liquid cloud droplets in an environment of rising air can rise a substantial distance above the freezing level, becoming colder and colder, without freezing as long as they remain undisturbed. What is meant by "undisturbed?" If an aircraft happens to fly through these "super-cooled" cloud droplets, the droplets will most likely freeze on impact with the aircraft. At least the smaller droplets would freeze instantly, forming rime ice. If the clouds happen to be made up of larger droplets, it might take a few seconds for the drops to freeze forming a glaze of clear ice.

A Seasonal Reminder About Braking Action Advisories and PIREPs

Runway braking action reports are furnished by pilots or airport management. These reports require categorization using the terms "good," "fair," "poor," "nil," or a combination. When braking action advisories are in effect, and the braking action report affects only a portion of a runway, describe the braking action for that portion of the runway and issue it in descriptive terms to each arriving and departing aircraft. Remember that when a "nil" braking action report is received, arrival and departure operations on that runway must cease.

When a braking action report includes the terms "fair," "poor," or "nil," or whenever conditions are conducive to deteriorating or rapidly changing runway conditions, terminal facilities are required to broadcast the statement, "Braking action advisories are in effect" on the Automatic Terminal Information System (ATIS).

Update information on the ATIS at locations where friction-measuring devices, such as MU-Meter, Saab Friction Tester, and Skiddometer are in use when the MU values are 40 or less. Use the runway followed by the MU number for each of the three runway segments, time of report, and a word describing the cause of the runway friction problem. Example: "Runway 27, MU 37, 32, 28 at one zero one eight Zulu, ice." Do not issue MU values when all three segments are greater than 40. Do not translate these readings into the braking action reporting categories. The MU value, or co-efficient of friction has meaning that is not aircraft specific, and therefore does not translate into the standard good, fair, poor, or nil.

Braking action pilot reports should be solicited when braking action advisories are in effect or when requested. These should be solicited in advance to allow the pilot adequate time to evaluate the situation and render a meaningful braking action report. It is not only our responsibility to solicit these reports when required, but also to issue this information in a timely manner for use by pilots. Procedures concerning this subject are in FAA Order JO 7110.65, Paragraphs 3-3-3, Timely Information, and 3-3-4, Braking Action, and FAA Order JO 7110.10, Paragraphs 4-4-1,

General, 4-6-6, Pilot Weather Reports, and 13-1-21, . Runway Conditions.

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*In this publication, the option(s) for which a briefing is required is indicated by an asterisk followed by one or more letter designators, i. e., * T – Tower, *E – ARTCC, *R – TRACON, or *F – AFSS/FSS.*
(Reference FAA Order JO 7210.3, Facility Operation and Administration, paragraph 2-2-9)
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