U.S. Department
of Transportation

Federal Aviation
Administration

Air Traffic Bulletin

Issue # 2010-5
SPECIAL
December 2010

A Communication from the
Vice President, System Operations Services

***In this Issue**:*

Winter Operations

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*TRF/E 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:

- Do not base runway separation on an assumption the truck driver or snowplow operator has the same understanding of control instructions as a pilot. Phrases and words such as “hold short,” “expedite,” and “proceed across” may be unfamiliar to someone not involved in regular air traffic communications.

- 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 enhance 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 Federal Aviation Administration 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 taxi 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.

Distribution: ZAT-423, ZAT-464

- 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.

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.

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 impair wing lift and propeller thrust, while it simultaneously increases weight and drag. This can be a deadly combination. Ice can reduce engine performance to dangerous levels. In the most severe case, it can cause engine failure.

There are several forecasts that contain warnings of icing. Pilot weather reports (PIREPs) 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 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 mentioned above 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 light icing under some conditions. In addition, some aircraft are extremely sensitive to airframe icing of any degree. Therefore, it is vitally important that all icing reports from pilots be processed following established procedures. Soliciting and relaying icing PIREPs, light or greater, is required. It is important to pass along all PIREPs. When icing conditions are forecast, 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 icing type, intensity, altitude, and air temperature in which icing is occurring when obtaining or providing 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 Ought to Know

As aviation professionals, we must be knowledgeable about the basic conditions which are most likely to produce winter flying problems. It does not take much time for a problem in the cockpit to become a problem in the air traffic facility.

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 10 degrees Celsius. However, icing is not uncommon at much colder temperatures and may occur down to -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 drop flows 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 of little significance. However, its irregular shape and rough surface decrease 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.

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.

Points to Remember

Weather-related information such as PIREPs, significant meteorological information, meteorological impact statements, center weather advisories, 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; 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.

Always pass any icing reports to the forecasters, and do not hesitate to ask for his/her help when needed. A forecaster is in an excellent position to integrate PIREPs into a current picture of expected icing.

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 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 "supercooled" 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 when a "nil" braking action report is received, 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.

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. Additional information is also contained in Advisory Circular 150/5200-30C, Airport Winter Safety and Operations, draft dated December 2010.

The Air Traffic Bulletin (ATB) is a means for headquarters to remind field facilities of proper application of procedures and other instructions. It is published and distributed quarterly, with special issues published as necessary.

Articles must be submitted electronically in Microsoft® Word by the offices of primary responsibility with approval at the group level or above. Quarterly articles must be received by the end of September, December, March, and June of each year.

*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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