# **Snow and Ice Control Plan**

# Leadville-Lake County Airport

Edited April 2015

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# **Definitions**

**Air Operations Area (AOA)** Those portions of the Airport on which aircraft normally operate. Includes both movement and non-movement areas. For the purpose of this document the AOA shall be considered those areas inside the airport security fence.

**Airport Certification Manual (ACM)** The document prepared in accordance with Title 14, Code of Federal Regulations (CFR), Part 139, *Certification of Airports* which establishes standards and procedures for airports serving scheduled passenger carrying operations of an air carrier.

**Air Traffic Control Tower (ATCT)** A service operated by appropriate authority to promote the safe, orderly, and expeditious flow of air traffic, and that provides air traffic control services to aircraft and vehicles operating on the movement area of an airport.

**Anti – Icing** The application of a solid or liquid anti-icing chemical material before the icing event so as to prevent the bonding of ice to the pavement surface.

**Apron or Ramp** The paved areas around air carrier terminals, cargo buildings, FBO's and aircraft maintenance facilities on which aircraft are operated, serviced, fueled or parked.

**Cargo Air Carrier Ramp** An AOA non-movement area designated for cargo air carrier airlines.

**Contaminant** For the purposes of this SICP references to contaminants means winter contaminants such as snow, slush, ice or standing water on or adhering to a pavement surface.

**Decelerometer (DEC)** Equipment used for measuring runway friction characteristics by means of applying vehicle brakes to take a "spot" friction measurement.

**De-lcing** The application of a solid or liquid deicing chemical material after the icing event has begun, and after the ice has accumulated and formed a bond on the pavement surface.

**Eutectic Temperature/Composition** A deicing chemical melts ice by lowering the freezing point. The extent of this freezing point depression depends on the chemical and water in the system. The limit of freezing point depression, equivalent to the lowest temperature that the chemical will melt ice, occurs with a specific amount of chemical. This temperature is called the eutectic temperature, and the amount of chemical is the eutectic composition. Collectively, they are referred to as the eutectic point.

**Federal Aviation Administration (FAA)** The Federal Government agency with regulatory authority, jurisdiction and oversight for public use airports, airspace, airmen and aircraft.

**Friction** The ratio of the tangential force needed to maintain uniform relative motion between two contacting surfaces to the perpendicular force holding them in contact. Simply stated, friction quantifies slipperiness of paved surfaces.

**Ice** The solid form of water consisting of a characteristic hexagonal symmetry of water molecules. The density of pure ice is 57 lb/ft3 (913 kg/m3), which is 9 percent less dense than water. Compacted snow becomes ice when the air passages become discontinuous at a density of approximately 50 lb/ft3 (800 kg/m3).

**Incursion, Runway** Any occurrence at an airport involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for the landing and takeoff of aircraft.

**Instrument Landing System (ILS)** A precision electronic transmission system which provides an approach path for exact vertical and lateral alignment of an aircraft on approach to a runway.

**ILS Critical Area or Critical Area** Areas of the Airport, where the electronic transmissions from an antenna of the ILS landing system are disrupted by the passage or presence of vehicles or mobile equipment.

**Letter of Agreement (LOA)** A document setting forth procedures and policies, agreed upon between the WAA and ATCT (and/or other agencies as appropriate).

**Movement Area** Those portions of the AOA, such as runways and taxiways, which are used for taxiing, takeoff, and landing of aircraft, and in which all movement of aircraft and ground equipment are, at all times, under the jurisdictional control of the ATCT.

**MU** The Greek letter MU (pronounced "myew") is used to designate a friction value representing pavement surface conditions. MU values range from 0 to 100 where 0 is the lowest friction value and 100 is the maximum friction value obtainable.

**Navigation Air (NAVAID)** Aircraft navigational aids, generally located within the AOA, which serves as a visual or electronic guide to landing aircraft.

**Non – Movement Area** Those portions of the AOA, such as passenger air carrier terminal ramp, cargo air carrier ramp, general aviation ramp, perimeter, non-paved surfaces, and designated service roads on which movements of aircraft and vehicles are not under the jurisdictional control of the ATCT.

**Object Free Area (OFA)** An area on the ground centered on a runway or taxiway that is to be free of all objects, except for objects that must be located in the OFA because of their function.

**Operations Lead Duty Officer ("Ops Lead")** The designated Airport Operations Manager or Airport Services Officer – Operations on the AOA responsible for the direct control and supervision of all airfield operational functions including movement area openings and closings, FAA ATCT communications and coordination, inspections, conditions assessment and reporting, and overall safety observation.

**Passenger Air Carrier Ramp** An AOA non-movement area designated for passenger air carrier airlines.

**Patchy Conditions** Areas of uncontaminated pavement showing through snow and/or ice covered pavements.

**Primary Runway** A runway expected to be used under the existing atmospheric and wind conditions where most of the takeoff and landing operations will take place.

**Runway Safety Area (RSA)** The protected portion of the movement area adjacent to a runway for the purpose of reducing the risk of damage to aircraft in the event they depart the prepared runway surface.

Runway Surface Condition Sensor System (RSCS) In-pavement stationary sensors that provide site-specific subsurface, pavement, air temperature data, dew point temperature, chemical strength, and other atmospheric weather conditions at the sensor sites. Sensor information is collected through remote processing units then transmitted to airport operations and maintenance users via a central processing unit.

**Secondary Runway** A runway expected to be used under the existing atmospheric and wind conditions that support a primary runway. Takeoff and landing operations on such a runway are generally less frequent than on a primary runway.

**Slush** Snow that has water content exceeding its freely drained condition such that it takes on fluid properties (e.g., flowing and splashing). Water will drain from slush when a handful is picked up. This type of water-saturated snow will be displaced with a splatter by a heel and toe slap-down motion against the ground.

**Snow** Porous, permeable aggregate of ice grains, which can be predominately single crystals or close groupings of several crystals.

**Snow (compacted)** Snow that has been compressed into a solid mass that resists further compression and will hold together or break up into lumps if picked up.

**Snow (dry)** Snow that has insufficient free water to cause cohesion between individual particles. This generally occurs at temperatures well below 32° F (0° C). If when making a snowball, it falls apart, the snow is considered dry.

**Snow (wet)** Snow that has grains coated with liquid water, which bonds the mass together, but that has no excess water in the pore spaces. A well-compacted, solid snowball can be made, but water will not squeeze out.

Snow Removal Lead Supervisor ("Snow Boss") The designated Airfield Maintenance duty supervisor on the AOA responsible for the direct control and supervision of snow and ice control procedures, equipment and staff. The Airport Ground Facilities and Fleet Manager, Airfield Maintenance Supervisor, Airport Equipment Maintenance Supervisor, Airport Pavement Maintenance Supervisor, or in some cases, the Airport Operations Manager may be designated as "Snow Boss."

**Snow Control Center (SCC)** A fixed location on the airport or mobile unit staffed by airport operations personnel for the purpose of acting as a prime source of field condition reporting, informing ATCT and airport users of expected movement area closures and openings, tenant coordination and liaison, and issuing NOTAMs.

**Snow and Ice Control Committee (SICC)** A group assembled and represented by airport departments, agencies, tenants and operators to address winter weather snow and ice control planning, communications, user needs, resources, critique and recommendations.

**Snow and Ice Control Plan (SICP)** A written plan containing procedures acceptable to the FAA Administrator, and required under the provisions of FAR Part 139.313, and AC 150/5200-30C, and includes at a minimum prompt removal or control of contaminants, positioning of snow, selection and application of materials, timely commencement of snow and ice control operations, and prompt notification to air carriers of current AOA conditions. Upon approval of the SICP by the FAA, the procedures contained therein become regulatory.

**Surface Incident** Any event where unauthorized movement by an aircraft, vehicle, or pedestrian occurs on the movement area that affects or could affect the safety of flight.

**Taxi Lane** A portion of non-movement area ramp/apron designated and marked for the purpose of taxiing aircraft between taxiways and parking.

**Taxiway** A portion of the movement area designed for taxiing aircraft between aprons and runways.

**Taxiway Safety Area** A portion of the movement area adjacent to a taxiway for the purpose of reducing the risk of damage to aircraft operating on the taxiway.

**Tenant** The responsible corporation, partnership, firm or individual who rents, leases or otherwise occupies facilities under an agreement on an airport owned and operated by the Wichita Airport Authority.

#### Phase #1 - PRE AND POST - WINTER SEASON TOPICS

# **Chapter 1-Pre-Season Actions**

# 1.1 Airport Preparation

# a) Airport Management Meetings.

The Airport Manager will typically initiate a meeting in the month of August/September timeframe to discuss equipment and material inventory, repair needs, staffing, budget, training, previous years issue's and any other topics associate with snow and ice control and its plan.

# b) Personnel Training.

All Airport and Public Works personnel should receive annual, recurrent snow removal training. All training for airport personnel will be conducted by the Public Works Director or his/her assignee. Training records are maintained by the Airport Manager. Training should be provided on subjects including;

- i) Proper snow equipment maintenance
- ii) Proper snow equipment use
- iii) Snow removal procedures
- (a) Proper snow pushing procedures
- (b) Snow removal standards
- (c) Snow dump location and use

#### b) Equipment Preparation.

In conjunction with the meeting mentioned in 1.1,a, the Airport Manager should see that each piece of snow removal equipment has been inspected and prepared. At this time required fluids, replacement parts, and snow removal equipment components will be inventoried and stockpiled.

# 1.2 Snow and Ice Control Committee (SICC) Meetings

The Airport, at one point, may decide to develop a Snow and Ice Control Committee (SICC) to provide feedback and make recommendations to snow and ice removal operations and to the overall Snow and Ice Control Plan (SICP) at Leadville-Lake County Airport. The SICC will be chaired by the Airport Manager and include the Lake County Road and Bridge Department.

Meetings will be held at the discretion of the Airport Manager. During the month of August, the Airport will begin notifying tenants and airport users to review and provide comments to be discussed at the upcoming season's initial meeting.

The following topics should be discussed in the SICC:

- Any requirements for containment/collection of deicing/anti-icing.
  - Update and review if necessary the Storm Water Control Plan
- Airport Clearing Operations Discussion Topics
  - o Areas designated as Priority 1 area, any new airfield infrastructure
  - Clearing operations and follow-up airfield assessments
  - o Potentials for pilot or vehicular runway incursions or incidents
  - Staff requirements and qualifications (training)
  - Update training program
  - Streamline decision making process
  - Response time to keep runways, taxiways and ramp areas operational
  - o Communication, terminology, frequencies, and procedures
  - Monitoring and updating of runway surface conditions
  - Issuance of NOTAMS and dissemination to ensure timely notification
  - Equipment inventory
  - Status of procurement contracts if any, including storage of materials
  - Procedures for storm water runoff mitigation
  - Snow hauling/disposing, snow dumps
  - Airfield lighting maintenance and concerns

# **Chapter 2 -Post Event/Season Actions**

#### 2.1 Post Event.

After each snow event, airport management may decide to host a meeting and invite individuals they deem appropriate to discuss any issues that have arisen from the event.

All members of the SICC will be encouraged to provide feedback to airport management before, during or following each snow event. After a significant event or a challenging operation a separate SICC meeting may be held. During the snow season winter operations will be an agenda item at Airport Board meetings.

#### 2.2 Post Season.

After each snow season a SICC meeting should be held, typically in May to review the snow season issues and recommendations for changes. The same topics as pre-season should be reviewed.

At the close of each season the mechanics will be tasked with inspecting and repairing snow removal equipment in preparation for next year's operations. Airport operations will be responsible for assessing the overall efficiency of the previous season's snow removal and will make recommendations on how to improve snow removal operations. Airport management will do an overall assessment on the SICP and make changes as necessary.

#### Phase #2 - Winter Storm Actions and Procedures

# **Chapter 3-Snow Removal Action Criteria**

# 3.1 Activating Snow Removal Personnel.

The Airport Manager holds the ultimate responsibility for activating snow removal personnel. If the manager is not present, the senior individual on duty will be responsible for assessing the situation and making decisions concerning the activation of additional snow removal personnel.

# a) Emergency Activation

- For Air Ambulance operations dispatch should notify Airport manager or Lake County Public Works
- If needed Airport Personnel my request dispatch to send out a page to Road and Bridge personnel for snow removal assistance.

# b) Weather Forecasting

- If the manager is not present, the senior personnel on duty is responsible for monitoring the current and/or forecast weather conditions. Weather conditions will be assessed at an appropriate interval.
- Weather data and information may be derived from either the airports ASOS or the NOAA's weather website.

#### c) Chain of Command

- If multiple individuals are on duty, the most senior staff member will be responsible for monitoring the airfields conditions at appropriate intervals.
- Airfield operations will be responsible for physically inspecting the runway conditions.
- If additional personnel are needed to assist in snow removal the Airport Manager will ultimately be responsible for initiating the Snow Alert Callout.
- Personnel will be notified by phone call.

# d) Triggers for Initiating Snow Removal Operations

<u>Precipitation</u>	Depth in Inches	
Slush	1 inch	
Wet Snow	2 inches	
Dry Snow	3 inches	
Ice or Freezing Rain	100% coverage of RWY	

These triggers will be assessed by Airport Operations personnel.

# 3.2 Personnel Responsible.

Whichever senior airport personnel is on duty at the time will be initially responsible for overseeing all airport snow removal operations.

# 3.3 Snow Control Center (SSC).

At this time there is no need for a formal Snow Control Center (i.e. snow desk or command vehicle).

# 3.4 Airfield Clearing Priorities.

Priorities for snow and ice removal are as follows.

# a) Priority 1

Runway 16/34. The runway should be open for operations as soon as possible after a storm along with Taxiway "D" to the FBO ramp. Once this area is clear and safe to park aircraft, normal operations may resume. In addition to these surfaces it should also be assured that the PAPI's are clear of any snow that might limit their function.

#### b) Priority 2

Next taxiways A, B and E should be cleared along with the hangar apron, the north aircraft tie down area and airport access roads. At this time the "South" parking area, also known as the fueling station area, should be cleared as well.

# c) Priority 3

Car parking and other areas

#### 3.5 Airfield Clearance Times.

For its Priority 1 items the Leadville-Lake County Airport will hold itself to the FAA snow removal standards for Non-commercial service airports. (See chart below)

For an average of 10,000 annual operations snow removal operations should take no longer than 3 hours.

Table 1-2. Clearance Times for Non-Commercial Service Airports

Annual Airplane Operations	Clearance Time <sup>1</sup>
(includes cargo operations)	(hour)
40,000 or more	2
10,000 – but less than 40,000	3
6,000 – but less than 10,000	4
Less than 6,000	6

General: Although not specifically defined, Non-Commercial Service Airports are airports that are not classified as Commercial Service Airports [see Table 1-1,general note].

Footnote 1: These airports may wish to have sufficient equipment to clear 1 inch (2.54 cm) of falling snow weighing up to  $25 \text{ lb/ft}^3$  (400 kg/m<sup>3</sup>) from Priority 1 areas within the recommended clearance times.

# 3.6 Snow Equipment List.

The following snow removal equipment is utilized by the Leadville-Lake County Airports:

- 1992 International Paystar Truck with a 20'plow License tag # 242-QEL
- 1993 Oshkosh H-Series Service Truck with a rotary blower License tag # 019-REM
- 1989 Oshkosh Blower Truck with a 16'plow and a 3000 series Sweepster broom License tag # 717-AVR
- Caterpillar 416C Backhoe with 10' blade and bucket License tag # 705-AVR
- 1990 Dodge truck with a XXX plow License tag # 847A22

# 3.7 Storage of Snow and Ice Control Equipment.

When possible, snow equipment will be stored in the Airports Snow Removal Equipment (SRE) building. The equipment will be maintained by the mechanics at Lake-County Road and Bridge Shop.

# **Chapter 4 - Snow Clearing Operations and Ice Prevention**

# 4.1 Snow Clearing Principals

#### a) Ramp and Terminal

As part of priority 1, snow clearing for the ramp and terminal will be cleared in a timely manner.

While clearing the ramp and terminal area caution will be exercised to ensure that all signs are clear of snow.

The stockpiling of snow should also be **closely watched**. Height limitations and aircraft wing clearance should be considered along with ensuring the height of snow piles does not obstruct the view of pilots. When the pilots view is obstructed in such a way that might affect safety, the obscuring snow should be removed to a safe dumping area.

# b) Runway and Taxiways

When it is determined the runway needs to be cleared, plowing will be accomplished with any available snow removal equipment. The Runway should be cleared to its full width every time it is plowed.

Typically plowing the runway will be initiated at the north end of the field. Starting at the center of the runway and making subsequent passed up and down its length until the runway surface is clear of snow.

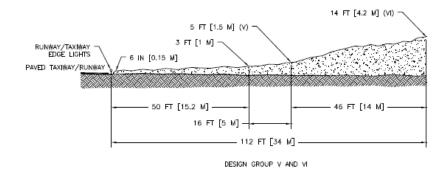
It should be noted that since the Leadville-Lake County Airport gets such a large amount of snow every year, it is often difficult to keep runway lighting clear. It should be one of the primary goals of the snow removal team to keep these lights clear at all times.

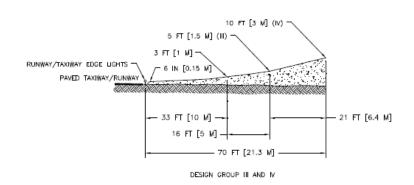
Snow should be cleared to the FAA standard for snow bank height profiles. (See Figure 4-1)

# c) NAVAIDs

Special attention should be paid to the snow clearance around the airports PAPI's. When necessary snow may need to be removed from around them to assure proper function. It should also be noted what while removing snow from the runway, caution should be exercised as not to pile snow around the PAPI's. (See figure 4-2)

AC 150/5200-30C 12/9/08





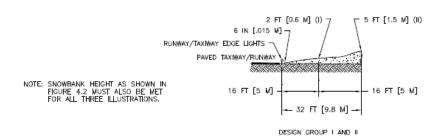
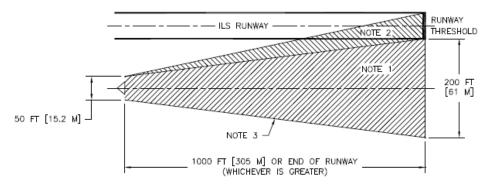


Figure 4-1. Snow Bank Profile Limits Along Edges of Runways and Taxiways with the Airplane Wheels on Full Strength Pavement (see Figure 4-2 guidance)

12/09/08 AC 150/5200-30C



#### NOTES:

- 1. CATEGORY I GLIDE SLOPE SNOW CLEARANCE AREA.
- 2. CATEGORY II AND III GLIDE SLOPE SNOW CLEARANCE AREA. THE AREA DEPICTED UNDER NOTE 1 SHALL ALSO BE CLEARED.
- 3. THE DEPTH OF SNOWBANKS ALONG THE EDGES OF THE CLEARED AREA SHALL BE LESS THEN 2 FEET.

ACTION TAKEN	SNOW DEPTH			
	SBR <6 IN [15 cm]	SBR 6 TO 8 IN [15 TO 20 cm]	SBR >8 IN [20 cm]	
	NR. CEGS <18 IN [45 cm]		NR. CEGS <24 IN [60 cm]	
SNOW REMOVAL (SEE ABOVE FIGURE)	REMOVAL NOT REQUIRED RESTORE FULL SERVICE AND CATEGORY.	ILS CATEGORY I  REMOVE SNOW 50 FT [15M] WIDE AT MAST WIDENING TO 200 FT [60M] WIDE AT 1000 FT [300M] OR END OF RUNWAY TOWARD MIDDLE AMRKER.		
		ILS CATEGORIES II AND III		
		AS ABOVE PLUS WIDEN THE AREA TO INCLUDE A LINE FROM THE MAST TO THE FAR EDGE OF RUNWAY THRESHOLD.		
NO SNOW REMOVAL	RESTORE FULL SERVICE AND CATEGORY.	ALL CATEGORIES	ALL CATEGORIES	
		RESTORE TO CATEGORY I SERVICE, CATEGORY D AIRCRAFT MINIMA RAISED TO LOCALIZER ONLY.	APPROACH RESTRICTED TO LOCALIZER ONLY MINIMA.	
		TYPICAL NOTAM TEXT:	TYPICAL NOTAM TEXT:	
		"DUE TO SNOW ON THE IXXX (APPROPRIATE IDENTIFER) GLIDE SLOPE, MINIMA TEMPORARILRY RAISED TO LOCALIZER ONLY FOR CATEGORY DAIRCRAFT" IF APPUCABLE, "CATEGORY II /A"* OR "CATEGORY II/III NA".	"DUE TO SNOW ON THE IXXX (APPROPRIATE IDENTIFER) GLIDE SLOPE, MINIMA TEMPORARILRY RAISED TO LOCALIZER ONLY.	

\* NA (NOT AUTHORIZED)

Figure 4-2. ILS CAT I and CAT II/III Snow Clearance Area Depth Limitations

# 4.2 Controlling Snow Drifts

At the airports discretion, it may erect FAA approved snow fences to help mitigate snow drifts on the airport. The Airport may also utilize the H-series snow blower to remove drifts from various areas on the airport.

# 4.3 Snow Disposal

When snow has to be disposed of, it will be removed by front-end loader or truck to the airports approved snow dumping site. Acceptable sites include:

- Drainage area located south east of taxiway C
- The terrain droop off on the west side of the approach end of runway 16.

#### 4.4 Methods for Ice Control and Removal-Chemicals

No anti-icer or deicer products are currently being used for removal of snow or ice from the airfield.

#### 4.5 Sand

Sand is currently not used on the airport.

# 4.6 Surface Incident/ Runway Incursion Mitigation Procedures

Vehicle operators will be carful to not cause direct, indirect, or peripheral damage to any paved surface on the airport, runway/taxiway edge lighting system, or any other airport equipment or facility. At no time shall the equipment operators remove snow in such a way as to obscure or bury any airport lighting system runway/taxiway lights, approach lights, etc. Vehicles will be marked and lighted in accordance with AC 150/2510-5, Painting, Marking and Lighting of Vehicles Used on an Airport.

# a) Radio Communication

All airport snow removal vehicles will be equipped with radio communication equipment, either in the form of installed radios or hand held radios. During operations on and around the runway snow removal personnel will continually monitor and communicate on the airfields CTAF frequency. Radio calls should be made whenever:

- i. Entering the runway
- ii. Exiting the runway
- iii. Whenever a piece of equipment has stopped on the runway.
- iv. Whenever the driver feels a call would benefit safety.

# b) Failed Radio Communication

If at any time snow removal personnel finds their radio equipment has failed they will exit the airside area and have their equipment fixed or replaced prior to re-entering said area.

# c) Low Visibility and Whiteout Conditions

During low visibility or whiteout conditions snow removal equipment will not be allowed on the runway, as it caused too much of a collision hazard with aircraft which may be attempting an instrument approach.

# d) Driver Fatigue

No driver will be allowed to operate equipment for more than twelve hours in a row without a least an eight hour rest period prior to their next shift.

# **Chapter 5-Runway Surface Assessment Reporting**

# 5.1 Runway Condition Reporting

A runway condition should be assessed whenever the pavement condition is worse than bare and wet.

Runway surface conditions by contaminate will be determined by visual inspection. The depth of such contamination will be determined by physically measuring it.

When reports are being made, runway conditions will be updated anytime a change to the runway surface conditions occurs. Such a change may include:

- Active snow event
- Plowing/brooming
- Rapidly rising or falling temperatures
- Rapidly changing conditions

When any event occurs that effects contamination of the runway, runway condition should be re-assessed as quickly as possible.

To assure reports are conducted in an accurate and timely manner runway conditions will be assessed:

- Continuously during a snow event by the senior airport personnel on duty
- Runway condition data will be made available to anyone wishing to use the airport upon request.

• When airport personnel feels the situation warrants it, they will fill out weather information report forms to document weather related events.

Because Leadville-Lake County Airport is not continuously monitored for surface conditions a NOTAM should be issued annually to reflect this. It should read as follows:

"Airfield surface conditions not monitored between the hours of	_ and
local time."	

In addition to this NOTAMS should also be filed for events such as:

- a. Closure of the runway or taxiways, and equipment operating on/or adjacent to the aircraft movement areas.
- b. Snow drifts, ridges or windrows of snow on or adjacent to the operational areas.
- c. Braking action advisories.
- d. Other hazards to aircraft operations.
- e. Inspection and maintenance of snow removal equipment for proper operation, and readiness during the winter months.
- f. Closing, and then re-opening the airport for snow removal operations...

# 5.2 Runway Friction Surveys and Equipment

Leadville-Lake County Airport does not currently utilize runway friction surveying equipment.

Any friction information determined may be estimated by airport personnel, however it should be recognized that such data is not derived from any calibrated piece of equipment.

# 5.3 Requirements for Runway Closures

Runways receiving a NIL braking report (either by a PIREP or by a braking action assessment by the airport operator) are unsafe for aircraft operations. In such a situation the runway should be closed immediately and a NOTAM to that effect filed.

In addition to a report of NIL braking, airport staff may also utilize their judgment to initiate runway closures for other conditions they feel would warrant the closing of the airport.

# 5.4 Continuous Monitoring

It is the duty of all airport personnel on staff to periodically make themselves aware of changing runway conditions. Whenever a weather event occurs that may cause deteriorating braking or other adverse surface conditions continuous monitoring should be initiated.