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This instruction provides guidelines and procedures for the snow and ice control program (S&ICP). It implements Air Force policy directive (AFPD) 32-10, *Air Force Installations and Facilities*. This publication applies to all USAF, Air Force Reserve Command (AFRC), and the Air National Guard (ANG) units and personnel. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with Air Force manual (AFMAN) 33-363, *Management of Records*, and disposed of in accordance with the Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS) located at <https://www.my.af.mil/afirms/afirms/afirms/rims.cfm>. This publication may be supplemented at any level, but all direct supplements must be routed to the office of primary responsibility (OPR) for this publication for coordination prior to certification and approval. Users should send comments and suggested improvements on AF Form 847, *Recommendation for Change of Publication*, through major commands (MAJCOM) and HQ AFCESA, 139 Barnes Drive, Suite 1, Tyndall AFB, FL 32403-5319, to HQ USAF/A7C, 1260 Air Force Pentagon, Washington, D.C. 20330-1260. MAJCOMs, field operating agencies (FOA) and direct reporting units (DRU) must send one copy of each supplement to HQ AFCESA/CEO; other commands send one copy of each supplement to the next higher headquarters.

(8FW) AFPD 32-10, *Installation and Facilities*, 4 Mar 2010 and AFI 32-1002, *Snow and Ice Control (S&IC)*, 19 Oct 2011 are supplemented as follows: The purpose establishes priorities, responsibilities, and procedures for S&IC and applies to all assigned, attached, and associated units to the 8th Fighter Wing, Kunsan Air Base, Republic of Korea. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the AF Form 847, *Recommendation for Change of Publication*; route the AF Forms 847 from the field through the appropriate functional chain of command. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with Air Force Manual (AFMAN) 33-363, *Management of Records*, and disposed of in accordance with Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS) located at <https://www.my.af.mil/afrims/afrims/afrims/rims.cfm>.

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SUMMARY OF CHANGES

This document has been substantially revised and must be completely reviewed. This revision updates and clarifies previous guidance on snow and ice control (S&IC), and emphasizes environmental impact. It expands the criteria for applicable installations (paragraph 1.1.1); notes references to aircraft deicing/anti-icing (paragraph 1.1.2); snow and ice control (S&IC) objective (paragraph 1.2); establishes snow and ice control priorities (paragraph 1.4); privatized family housing (PFH) (paragraph 1.4.3); references and resources (paragraph 1.5); defines roles and responsibilities of other agencies or organizations (paragraph 2.1); evaluation by MAJCOMs (paragraph 2.1.4.4); weapon systems program managers (paragraph 2.1.7); defines snow and ice control committee (S&ICC) (paragraph 2.2); defines responsibilities of the installation commander (paragraph 2.2.1); the mission support group commander (paragraph 2.2.2); the base civil engineer (paragraph 2.2.3); asset management flight chief (paragraph 2.2.4); the operations flight commander or operations superintendent (paragraph 2.2.5); the heavy repair superintendent (paragraph 2.2.6); the security forces squadron (paragraph 2.2.7.); the force support squadron (paragraph 2.2.8); the communications squadron (paragraph 2.2.9); mobile and telephone communications (paragraph 2.2.9.1); the operations group commander (paragraph 2.2.10); minimum runway condition readings (RCR) (paragraph 2.2.10.2); command post senior controller (paragraph 2.2.11); the maintenance operations control center (MOCC) (paragraph 2.2.12); the airfield manager (AFM) (paragraph 2.2.13); the weather flight chief (2.2.14); the maintenance group commander (paragraph 2.2.15); the contracting officer (paragraph 2.2.16); the logistics readiness squadron (paragraph 2.2.17); safety (paragraph 2.2.18); defines snow removal training (paragraph 3.1.1); snow removal readiness (paragraph 3.2); obtaining materials and parts (paragraph 3.3); protecting air force property (paragraph 3.4.); military family housing privatization project owner (MFHP PO) (paragraph 3.4.1) reviewing runway ice detection systems (RIDS) (paragraph 3.6.1); establishing the snow control center (SCC) (paragraph 3.7); snow removal procedures (paragraph 4.1); basic guidelines (paragraph 4.1.1); maintaining communications (paragraph 4.1.2); determining right-of-way (paragraph 4.1.3); following general procedures (paragraph 4.1.4); runway edge lights (paragraph 4.1.7); semi-flush, in-pavement lights (paragraph 4.1.8); defines the responsibilities of facility managers (paragraph 4.1.11); MFHP PO (paragraph 4.1.12); describes the use of temporary airfield markings

(paragraph 4.1.13); use of ice-control chemicals (paragraph 4.2.3); storage of anti-icing/deicing chemicals (paragraph 4.2.4); dispensing anti-icing/deicing chemicals (paragraph 4.2.6); anti-icing (paragraph 4.2.7); deicing (paragraph 4.2.8); ensures use of abrasives on the airfield comply with Federal Aviation Administration (FAA) standards (paragraph 4.2.9); S&IC on roadways, parking lots, housing and other areas (paragraph 4.3); requires use of pollution prevention/best management practices (P2/BMP) (paragraph 5.1); includes a requirement to track chemical consumption (paragraph 5.4); provides guidance for use of non-urea alternative chemicals (Attachment 2); and includes information for Society of Automotive Engineers (SAE) Aerospace Material Specification (AMS) certification of chemicals (paragraphs A2.1 and A2.2).

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Chapter 1

KEY INSTRUCTIONS

1.1. Applying the Snow and Ice Control Plan (S&ICP).

1.1.1. **Ground Support.** Installations with over 150 millimeters (6 inches) of average annual snowfall will maintain a snow and ice control plan (S&ICP) and form a snow and ice control committee (S&ICC). For installations which receive less than 150 millimeters (6 inches) of average annual snowfall, the installation commander will create plans and committees to meet their specific needs.

1.1.2. **Aircraft Support.** Specific anti-icing/deicing procedures for aircraft maintenance are maintained in the technical orders (TO) for each type of aircraft. A forum similar to the S&ICC should be used to coordinate the aircraft anti-icing/deicing program. **Note:** Aircraft anti-icing/deicing agents and general procedures are listed in TO 42C-1-2, *Anti-Icing, Deicing and Defrosting of Parked Aircraft*.

1.1.3. **(Added-8FW)** Kunsan Air Base is required to maintain a Snow and Ice Control Plan (S&ICP) and form a Snow and Ice Control Committee (S&ICC)

1.2. Snow and Ice Control (S&IC) Objective. Begin runway S&IC operations removal just prior to, or at the onset of, snowfall or icing conditions to provide continuous bare pavement. Installations without a flying mission will establish when S&IC operations should begin according to mission requirements. The snow control center (SCC), command post, airfield management (AM), and control tower must maintain close communications at all times.

1.3. Supporting the Mission. Maintain continuous mission capability by removing snow and ice from airfield and base pavements. Judge the success of the program by the safe movement of aircraft and vehicles during inclement winter weather.

1.4. Prioritizing Snow Removal. S&IC from all paved surfaces typically cannot be accomplished simultaneously; therefore, three priorities are established to ensure S&IC operations are accomplished in order of relative mission importance and publicized to avoid misunderstandings among base agencies. Priorities can be changed when directed by the S&ICC chair, in the best interest of flight safety and/or airfield mission requirements. Joint basing priorities will be determined during the S&ICC meeting. Maps will be color-coded in the following manner: Priority 1: red; Priority 2: yellow; Priority 3: green. For safe operation of vehicles and equipment, establish a primary access route to and from the airfield. Establish priorities in accordance with the following guidelines (**Note:** Priority areas may be different for those bases without an active airfield. Joint base operations will comply with this instruction as much as possible, taking into account multiple missions and/or runways. The S&ICP should be flexible to allow for separate mission operations.):

1.4.1. Priority 1 (Red):

1.4.1.1. Primary active runways (overruns, when used for operations).

1.4.1.2. Primary runway accesses to taxiways and alert facilities.

1.4.1.3. Apron accesses to taxiways.

1.4.1.4. Aircraft crash/fire equipment lanes.

1.4.1.5. Access roads to special weapons, ammunition storage, refueling points, and other primary mission facilities.

1.4.1.6. For safe operations, establish navigational aids (NAVAIDS) for the primary instrument runway and primary access routes to and from the runway and to emergency facilities, i.e., hospital, fire, and emergency services.

1.4.1.7. **(Added-8FW)** All roads in Gun Smoke Hill Housing area.

1.4.1.8. **(Added-8FW)** Wolf Pack Park and Water Plant.

1.4.1.9. **(Added-8FW)** High-speed taxiway South and Republic of Korea Air Force (ROKAF) alert apron.

1.4.1.10. **(Added-8FW)** Parallel Taxiway, Taxiways "A" and "E" including the arm/de-arm pad.

1.4.1.11. **(Added-8FW)** Taxiway "F", including access to fire station and for vehicles to exit station onto Avenue "B".

1.4.1.12. **(Added-8FW)** Avenue "B" between Taxiway "C" and Taxiway "F" and 50 feet on both sides of the stop signs.

1.4.1.13. **(Added-8FW)** Hospital ambulance garage Bldg 408 entrance to West 10th Street to Avenue "C" and the secondary ambulance parking area on East 9th Street at Bldg 424.

1.4.1.14. **(Added-8FW)** Remove snow for the emergency travel route from the Hospital to the Parallel Taxiway, Avenue "C" to Avenue "B".

1.4.1.15. **(Added-8FW)** Munitions Storage Area. Note: The primary munitions routes in Area 1 will be cleared by 8th Civil Engineer Squadron (8 CES) personnel. 8th Maintenance Squadron, Munitions Flight (8 MXS/MXMW) will clear out 25 feet around all storage structures.

1.4.1.16. **(Added-8FW)** ROKAF will clear the roads inside MAGNUM and they coordinate with Gunsan City to clear the road from the north gate to MAGNUM Site. If Gunsan City fails to clear the road between North Gate and MAGNUM site, 8 CES may clear as needed and when authorized by 8 MSG/CC. 8 MXS/MXMW is the POC.

1.4.1.17. **(Added-8FW)** Korean Airline (KAL) taxiway to perimeter gate.

1.4.2. Priority 2 (Yellow):

1.4.2.1. Secondary runways, overruns, and taxiways.

1.4.2.2. Aircraft parking aprons and remaining aircraft movement areas.

1.4.2.3. Access roads to secondary mission facilities and primary base streets.

1.4.2.4. Covers NAVAIDS for those runways not covered in Priority 1.

1.4.2.5. **(Added-8FW)** JUVAT and PANTON flows.

1.4.2.6. **(Added-8FW)** North and south loops (including turn around and liquid oxygen areas).

- 1.4.2.7. **(Added-8FW)** Taxiways “B”, “C” and “D”.
- 1.4.2.8. **(Added-8FW)** Quick-turn area (as required).
- 1.4.2.9. **(Added-8FW)** Taxiway “F” to west entrance of south loop.
- 1.4.2.10. **(Added-8FW)** Entire ramp area in front of Base Operations.
- 1.4.2.11. **(Added-8FW)** POL areas (north and south), Bldg 2602 (fuel truck staging area), and Bldg 816 (Military Fuel Station).
- 1.4.2.12. **(Added-8FW)** 8th Street from Main Gate, down 3rd Street to Avenue “C”.
- 1.4.2.13. **(Added-8FW)** Tree Area Note: In the event of a Slammer Recall, Slammer Super will notify the Airfield Management to have the Tree Area cleared immediately. When alert aircraft are present, the Tree Area is treated as Priority 1. Additionally, Echo and Foxtrot Patriot Missile Battery Sites and their entrances will become Priority 1 during a Slammer Recall.
- 1.4.2.14. **(Added-8FW)** Remove snow on Avenue “B” from Bldg 2837 (EOD) to Airfield Management Operations and onto the flightline.

1.4.3. **Priority 3 (Green):** All other areas, including military family housing. Privatized family housing (PFH) area S&IC obligations will be determined during the S&ICC meeting and will be in accordance with ground lease, operating agreement and other military family housing privatization (MFHP) transaction documents (TD).

- 1.4.3.1. **(Added-8FW)** Entire WOLF PACK Flows area along the Parallel Taxiway.
- 1.4.3.2. **(Added-8FW)** East end of Taxiway “H” and Taxiway “C” beginning at the “Red Line”.
- 1.4.3.3. **(Added-8FW)** Operational areas for the 80th Fighter Squadron and the 35th Fighter Squadron.
- 1.4.3.4. **(Added-8FW)** Hot cargo pad (as required by Airfield Manager).
- 1.4.3.5. **(Added-8FW)** Taxiway “G”.
- 1.4.3.6. **(Added-8FW)** Overflows Pad, north and south.
- 1.4.3.7. **(Added-8FW)** Perimeter road to navigational aids (NAVAIDS) and Air Traffic Control (ATC) site.
- 1.4.3.8. **(Added-8FW)** Common-use sidewalks.
- 1.4.3.9. **(Added-8FW)** Parking lots.
- 1.4.3.10. **(Added-8FW)** Graveled roads and all other areas as required.
- 1.4.3.11. **(Added-8FW)** All remaining streets.

1.5. Using References and Resources. All S&IC activities that affect the environment must comply with AFD 32-70, *Environmental Quality*. Allowance Standard (AS) 464, *Civil Engineer – Operations Flight Support Equipment*, and AS 010, *Vehicles Owned by the United States Air Force for Permanent Bases*, help determine the type and amount of equipment authorized for S&IC. Federal Aviation Administration Advisory Circular (FAA AC) 150/5200-30C, *Airport Winter Safety and Operations*, and FAA AC 150/5220-20, *Airport Snow and Ice*

Control Equipment, use abrasives (sand) only in emergency conditions to improve traction on airfield surfaces. Guidance on pollution prevention/best management practices (P2/BMP) is available from USAF/A7CAN. If possible, S&IC vehicle operators should review the “Snow and Ice Control Techniques” training available at the AFCESA Civil Engineer Virtual Learning Center (VLC): <https://afcesa.csd.disa.mil>. Installations that receive more than 900 millimeters (36 inches) of average annual snowfall, as stated in the surface observation climatic summary maintained by the base weather station (for the entire reporting period), will earn a manpower variance for S&IC (see Air Force manpower standard [AFMS] 44E0, *Operations Flight*). Use this earned manpower to hire extra workers. Installations may also use service contracts to augment their snow removal team, as approved by the BCE.

Chapter 2

MANAGEMENT RESPONSIBILITIES

2.1. Administration Responsibilities and Roles.

2.1.1. **Secretary of the Air Force (SAF).** Deputy Assistant Secretary of the Air Force for Acquisition (Science, Technology, and Engineering) (SAF/AQR), will provide weapon system program managers guidance on roles and responsibilities for coordinating issues involving airfield anti-icing/deicing agents.

2.1.2. The Civil Engineer (USAF/A7C):

2.1.2.1. Maintains overall responsibility for airfield anti-icing/deicing and assigns operational management responsibilities to the Air Force Civil Engineer Support Agency (AFCESA).

2.1.2.2. Advocates for airfield anti-icing/deicing program funding requirements through the planning, programming, and budgeting system (PPBS) process.

2.1.3. Air Force Civil Engineer Support Agency (AFCESA):

2.1.3.1. Recommends procedures for administering the S&ICP for the Air Force.

2.1.3.2. Assists USAF/A7C to develop and test new deicing technologies.

2.1.3.3. Provides technical assistance to the MAJCOMs and keeps them informed of new deicing technologies.

2.1.3.4. Responsible for providing all airfield anti-icing/deicing and S&IC information, including updated copies of all references in this instruction (e.g., TOs, AFPDs, FAA guidance, authorized deicing chemicals) on the Civil Engineer Snow and Ice Control Community of Practice (CoP): <https://afkm.wpafb.af.mil/community/views/home.aspx?Filter=OO-MS-CE-50>.

2.1.4. **MAJCOMs.**

2.1.4.1. MAJCOMs review Air Force installation and non-Air Force requests for use of particular airfield anti-icing/deicing agents. Forward requests to the MAJCOM for the affected aircraft, or if they are the Lead Command (for affected aircraft), forward the request to the appropriate Aircraft Single Manager (ASM). If a requested agent is not approved, MAJCOMs will forward the request to HAF/A7C or AFCESA for processing. MAJCOMs will send a coordinated response back to the base with approved memos for implementation at the S&ICC. Approved memos will be listed as attachments to the S&ICP. If a requested agent is not approved or an aircraft is not listed on the ASC Runway and Deicing CoP, MAJCOMs will forward the request to USAF/A7C or AFCESA/CEO for processing. ASMs are responsible for determining how anti-icing/deicing chemicals may affect their aircraft.

2.1.4.2. Where an agent is approved by one ASM and disapproved by another ASM on the same installation, the host MAJCOM will take the lead and resolve the issue with the ASMs. MAJCOMs will forward requests for anti-icing/deicing chemicals to AFCESA/CEO for review and approval.

2.1.4.3. MAJCOMS validate, prioritize, and submit airfield anti-icing/deicing program funding requirements to USAF/A7C.

2.1.4.4. MAJCOMs validate, prioritize, and submit airfield anti-icing/deicing capability needs to Air Force Material Command (AFMC).

2.1.5. Installations.

2.1.5.1. **Snow and Ice Control Plan (S&ICP).** Each installation will create an S&ICP in accordance with this instruction. The S&ICP will include procedures from this instruction but should be tailored to meet local needs. Attach snowfall history, equipment and attachment inventory, team composition, material and parts levels, and color-coded maps. The S&ICP should be reviewed annually and revised as necessary. The installation commander will give final approval to the base S&ICP. The service provider for S&IC operations will ensure adequate information is provided in the base S&ICP to effectively achieve mission requirements.

2.1.5.2. **Snow and Ice Control Committee (S&ICC) Members.** Paragraph 2.2 lists the representatives who make up the S&ICC membership. Select additional representatives from major tenant organizations and PFH PO.

2.1.5.3. **Snow and Ice Control Committee (S&ICC) Meetings.** Each installation is responsible for holding at least two S&ICC meetings each year. Conduct a pre-season meeting between 1 September and 15 October and a post-season meeting between 15 April and 31 May. Installations which do not receive enough snow to warrant a physical meeting may elect to conduct the pre-season and post season meetings electronically. The S&ICC will review:

2.1.5.3.1. Snow removal priorities.

2.1.5.3.2. Organizational responsibilities.

2.1.5.3.3. Problems encountered during the previous seasons.

2.1.5.3.4. Contract needs for emergency S&IC.

2.1.5.3.5. Levels of spare parts, materials, and deicing chemicals.

2.1.5.3.6. Manning (augmentee) requirements.

2.1.5.3.7. Snow removal equipment status.

2.1.5.3.8. Off-season rebuild program/depot repair needs.

2.1.5.3.9. Chemical consumption and impacts on aircraft, airfield infrastructure, and the environment.

2.1.5.4. **Internal Working Group.** The S&ICC may form an internal working group to coordinate details on issues not requiring approval by the entire S&ICC.

2.1.5.5. **Primary Aircraft Authorization.** Before using any airfield anti-icing/deicing agents, the installation will obtain approval for their primary aircraft authorization (PAA) from the appropriate ASM(s), coordinated through AFCESA/CEOO. If there is more than one PAA at a particular installation, approval is required from each PAA ASM. Requests

will be routed through the appropriate MAJCOM for review and action and the S&ICC will ensure that tenant aircraft are considered in the request.

2.1.6. Non-Air-Force-Owned Installations (Other Services, Commercial, OCONUS). Units with aircraft based at non-Air-Force-owned installations will advise the MAJCOM of the airfield anti-icing/deicing agents being used (since the unit will not have any input as to the anti-icing/deicing agent being used). Unapproved deicing chemicals may have to be used at OCONUS non-Air-Force-owned installations.

2.1.7. Weapon Systems Program Managers.

2.1.7.1. Upon receipt of a MAJCOM request to use an airfield anti-icing/deicing agent, evaluate the impact of the desired/requested airfield anti-icing/deicing agents on the performance of systems for which they are responsible. Provide the requesting MAJCOM with a recommendation on the advisability of proceeding based on assessments of potential adverse impacts of the system's operational safety, suitability, and effectiveness (OSS&E). The assessments should consider, at a minimum, adverse operational or maintenance impacts and additions to or increases in environmental, safety, and occupational health (ESOH) risks. As necessary, provide recommended mitigations to identified adverse impacts or ESOH risk increases or additions. Include recommended mitigations and the projected costs, schedule, and performance impacts that the MAJCOM will need to approve in order to implement the mitigations.

2.1.7.2. Upon notification by a MAJCOM of airfield anti-icing/deicing agents being used at a non-Air-Force-owned installation, recommend adjustments to maintenance activities and/or inspection intervals and/or operational restrictions to mitigate, if possible, any impact of the airfield anti-icing/deicing agents.

2.1.7.3. Identify to AFCESA/CEO the funding needs associated with the analysis and testing required to evaluate the impact of desired/requested airfield anti-icing/deicing agents.

2.2. Snow and Ice Control Committee (S&ICC) Members. The following compose the S&ICC membership and will perform the described functions at Air Force installations:

2.2.1. Installation Commander. The installation commander forms and chairs the S&ICC and appoints additional members as needed. When snow removal conditions warrant SCC activation, the heavy repair superintendent will assume control authority for snow control operations for both the airfield and main base. Control PFH areas in accordance with MFHPTD.

2.2.1.1. **(Added-8FW)** 8FW has deemed the following to be S&IC Committee Members:

Figure 2.1. (Added-8FW) S & IC Committee Members

8 FW/CV	8 FW/CP
8 FW/SE	8 MSG/CC
8 MXG/CC	8 CES/CC (OPR)
8 OG/CC	8 CES Ops Flight CC
8 OSS/CC	8 CES Asset Mgmt Flight CC
8 OSS/OSAM (Airfield Manager)	8 CES Heavy Repair Supt
8 OSS Combat Weather Team	8 CS/CC
8 MXS/CC	8 FSS/CC
8 SFS/CC	8 LRS/CC
8 AMXS/CC	8 MOS/CC
CCK Contracting Officer	Korean Airfield Manager

2.2.2. **Mission Support Group Commander.** The mission support group (MSG) commander activates the S&ICP when needed.

2.2.3. Base Civil Engineer (BCE):

2.2.3.1. Coordinates installation S&IC activities.

2.2.3.2. Requests a manpower variance when authorized.

2.2.3.3. Approves requests for snow removal service contracts when justified.

2.2.3.4. Approves S&IC equipment for multiple uses (paragraph 4.3.5) and ensures new construction complies with paragraph 3.5.

2.2.3.5. **(Added-8FW)** Briefs the status of Snow and Ice Control equipment to 8 MSG/CC as required, from September to March. Will notify HQ PACAF/A7, DSN 449-9263, after coordinating with 8 LRS/LGRVM, anytime the overall designated snow removal equipment vehicle-in-commission rate falls below 80 percent, or if Snow and Ice Control equipment short-falls could affect emergency wartime operational capabilities.

2.2.4. **Asset Management Flight Chief:**

2.2.4. **(8FW)** 8th Civil Engineer Squadron Asset Management Flight Commander:

2.2.4.1. Briefs the S&ICC on the environmental impact of aircraft and airfield deicing chemicals at the pre- and post-season meetings.

2.2.4.2. Provides storm water (SW) program oversight to ensure operational procedures minimize potential impacts of aircraft and airfield deicing chemicals; identifies environmental requirements to contain and control SW runoff for programming by installation; programs for environmental funds to ensure requirements comply with current environmental programming guidance. The organization using mission-essential anti-icing/deicing chemicals is responsible for environmental cleanup of these products.

2.2.4.3. Reviews all snow dump locations for environmental impacts from runoff flow, monitoring requirements, annual maintenance, and chemical usage.

2.2.4.4. Ensures guidance on P2/BMPs is disseminated to personnel conducting airfield deicing.

2.2.4.5. Performs annual evaluation of implementation status and effectiveness of P2/BMPs and recommends to the S&ICC actions to improve effectiveness.

2.2.5. Operations Flight Commander or Operations Superintendent:

2.2.5.1. Provides adequate facilities, equipment, materials, and trained personnel for the S&ICP.

2.2.5.2. Provides recommended changes as necessary to the snow removal fleet and S&ICP to the S&ICC.

2.2.5.3. Implements S&ICC changes to fleet and S&ICP.

2.2.5.4. Inspects airfield infrastructure for corrosion or deterioration caused by deicing chemicals; reports findings and recommendations to the S&ICC.

2.2.5.5. Coordinates chemical use and application locations with the environmental flight.

2.2.6. Heavy Repair Superintendent:

2.2.6.1. Prepares the S&ICP.

2.2.6.2. Prepares for, performs, and follows up on S&IC activities.

2.2.6.3. Complies with the instructions in chapters 3, 4, and 5 of this instruction.

2.2.6.4. Plans the S&ICC meetings and publishes minutes.

2.2.7. Security Forces Squadron:

2.2.7. (8FW) 8th Security Forces Squadron Commander:

2.2.7.1. Enforces BCE restricted parking notices during S&IC operations.

2.2.7.2. Removes portable restricted area boundaries to allow for efficient snow-clearing operations.

2.2.7.3. Provides unimpeded entry/exit into "restricted" areas during snow-removal operations.

2.2.7.4. **(Added-8FW)** Authorizes snow removal personnel and/or equipment to enter restricted areas via taxiway gaps at other than established entry control points ("Breaking Red"). Prior to "Breaking Red," all snow removal personnel will first notify Snow Control. Snow Control will request, through Security Forces Control Center (8 SFS/SFCC) blanket clearance to travel back and forth on Taxiway "C" and "F". Patrols will be dispatched to initially check on AF Form 1199A, USAF Restricted Area Badge. Once all AF Forms 1199A have been checked, the patrol will grant blanket clearance to the snow removal team, under observation, to travel back and forth over the red line. Notes: (1) Once blanket clearance is granted, a patrol will position themselves (by the west gap) to observe same. Once complete with Taxiway "C" and "F," snow control will notify SFCC of termination of the blanket clearance. Once done, snow vehicles will be required to conduct normal notification (Snow Control to SFCC) when coming into and exiting the area. (2) Snow vehicles will no longer go through Base Operations. They will notify SFCC direct. Due to Snow Control (Ext. 782-5020) not having a direct line, SFCC will utilize an SF authentication/code of the day with the Snow Control dispatcher.

2.2.8. **Force Support Squadron:** Provide box meals for S&IC personnel whose duty hours and/or locations prevent the use of dining facilities. Box meals are not available to outsourced snow removal and ice control organizations.

2.2.8. (8FW) 8th Force Support Squadron Commander:

2.2.8.1. (Added-8FW) Provides priority service for all Snow and Ice Control personnel in all serving lines, to include midnight meals, during Snow and Ice Control operations. Provides box lunches for Snow and Ice Control personnel whose duty hours prevent them from eating in the dining facilities. Snow control shift supervisor will phone in the requests for the box lunches at least two hours in advance of pick up. Coffee may also be requested during meal hours..

2.2.9. Communications Squadron:

2.2.9.1. Provides mobile radio and telephone communications for S&IC operations.

2.2.9.2. Reviews requests for managing personal wireless communication systems (PWCS) in accordance with AFI 33-106, *Managing High Frequency Radios, Personal Wireless Communication Systems, and the Military Affiliate Radio System*

2.2.9.3. Repairs communication equipment for S&IC operations using established priority repair lists in unit or base directives.

2.2.10. Operations Group Commander:

2.2.10.1. Sets snow removal priorities for flying operations and provides timely weather information for S&IC operations.

2.2.10.2. Sets minimum runway condition readings (RCR) for departing and arriving aircraft.

2.2.11. **Command Post Senior Controller:**

2.2.11.1. Implements procedures for significant weather mission impacts in accordance with AFI 10-206, *Operational Reporting*, and local supplement; execute base notification, including delayed reporting, early release, base closures, and road condition updates via the installation notification and warning system.

2.2.11.2. Coordinates with AM "Local Notice to Airman" (L series NOTAM) concerning delayed base reporting and/or base closure. The NOTAM should address base closures, delayed reporting procedures, and base and local road conditions.

2.2.12. **Maintenance Operations Control Center (MOCC):**

2.2.12. (8FW) Airfield Manager:

2.2.12.1. Coordinates aircraft movement schedule through SCC through airfield management operations (AMOPS) at least 6 hours prior to movement.

2.2.12.2. Develops parking plans in coordination with the airfield manager (AFM) to be used during S&IC operations.

2.2.12.3. Directs maintenance activities to:

2.2.12.3.1. Clear all removable items not in use (e.g., tools, fire extinguishers, wheel chocks and aerospace ground equipment) from parking ramps to a designated area.

2.2.12.3.2. Clear snow from around permanently installed airfield equipment in the vicinity of the aircraft.

2.2.12.3.3. Remove aircraft from areas to be cleared, when feasible.

2.2.12.4. **(Added-8FW)** Directs snow removal operations to the next highest priority area when the runway or taxiway has an acceptable Runway Condition Reading (RCR) (ten or higher for F-16s, IAW AFI 11-2F-16V3, F-16--Operational Procedures). The RCR required will depend on what type of aircraft is conducting operations on that surface (e.g., civilian airliners do not require same RCR as F-16s to land safely). INFORMATIONAL NOTE: ROKAF requires RCR13 for alert aircraft and RCR16 for routine operations.

2.2.12.5. **(Added-8FW)** Directs airfield sweepers to clean the runway or a taxiway after snow removal operations are completed. Conducts a FOD check after airfield sweepers have cleaned the runway or taxiway, and informing the 8 OSS Tower Watch Supervisor (8 OSS/OSAT) on duty when the runway or taxiway is suitable for aircraft operations. Coordinates with 8 FW FOD Manager when FOD walks are required.

2.2.12.6. **(Added-8FW)** Notifies the SCC of priority changes for clearing airfield surfaces if operational needs dictate a deviation from the established plan. Informs the S&IC of the active End of Runway (EOR) area, if any, and provide a prioritized list of aircraft shelters requiring snow removal. All requests for changes to airfield priorities must be approved by 8 OG/CC, or designated representative, then forwarded to 8 OSS/OSAM for coordination with the SCC.

2.2.12.7. **(Added-8FW)** Publishes orders and instructions concerning communication procedures and vehicular traffic for airfield areas and aircraft parking, in order to facilitate S&IC operations. Restricts Prior Permission Required numbers to "Official Use Only". Approves airfield fixture markings for snow removal.

2.2.12.8. **(Added-8FW)** Initiates snow removal from NAVAID areas in coordination with 8 CES Snow Control and with 8 CS/SCMGB (NAVAID maintenance) personnel. NAVAID maintenance must be present during operations to ensure adequate snow removal in these areas. Snow accumulation must not be allowed to reach a height of 18 inches around NAVAID equipment (localizer/glide scope).

2.2.13. Airfield Management (AM):

2.2.13. **(8FW)** Operations Support Squadron Weather:

2.2.13.1. Gives priority to S&IC to allow aircraft operations to continue (coordinates with air traffic control tower [ATCT]). Normal airfield operations may continue but must not interfere with snow removal operations. Ensure close coordination between snow removal operations and airfield operations.

2.2.13.2. Conducts periodic runway friction readings in accordance with TO 33-1-23, *Equipment and Procedures for Obtaining Runway Condition Readings*, when there is snow, ice, or slush on the airfield. Once the readings are taken and compiled, they will be forwarded to the S&IC center to support efficient and effective ice control and removal with minimal chemical use. Airfields with little or no record of snow accumulation (based on the installation's climatology record) are not required to maintain friction-

measuring equipment (e.g., decelerometers, continuous friction measuring equipment) when approved by MAJCOM/A3 (typically in a MAJCOM supplement). **Note:** AM personnel must report the predominant runway surface condition (RSC) and indicate if no RCR is available.

2.2.13.3. Coordinates with Air Traffic Control Tower (ATCT) to transfer the controlled movement area (runway) clearance access to the airfield snow removal supervisor when requested during snow removal operations.

2.2.13.4. Publishes orders and instructions concerning:

2.2.13.4.1. Airfield licensing for snow removal equipment operators.

2.2.13.4.2. Vehicular traffic and communication procedures used in and around airfield areas.

2.2.14. **Weather Flight Chief:**

2.2.14. (**8FW**) Logistics Readiness Squadron Commander:

2.2.14.1. Provides around-the-clock weather forecasting and support during S&IC operations.

2.2.14.1. (**8FW**) Ensures a comprehensive summer rebuild program for Snow and Ice Control equipment is established IAW AFMAN 24-307, Procedures for Vehicle Maintenance Management.

2.2.14.2. Notifies the SCC when forecasts predict snow or ice accumulation.

2.2.14.2. (**8FW**) Provides a 24-hour maintenance capability to ensure timely maintenance and repair of all vehicular equipment used in snow removal operations. This includes immediate repair of all breakdowns during actual snow removal operations if resources are available (parts, tools, equipment).

2.2.14.3. Notifies the SCC of significant changes to a previous forecast.

2.2.14.3. (**8FW**) Provides 24-hour wrecker service during snow removal operations.

2.2.14.4. Provides information on request by the SCC or BCE.

2.2.14.5. Provides necessary data for pavement temperature forecasts at installations where runway ice detection systems operate.

2.2.15. **Maintenance Group Commander:** The subject matter expert briefs the S&ICC on actual and potential impacts of deicing chemicals on aircraft and weapon systems, and reports on maintenance activities conducted to mitigate these impacts

2.2.16. Contracting Officer:

2.2.16.1. Administers contracts for emergency equipment rental or repair.

2.2.16.2. Promptly procures parts and supplies for S&IC operations.

2.2.16.3. Sets up emergency procurement procedures for abnormal duty hours.

2.2.17. Logistics Readiness Squadron:

2.2.17.1. Develops and runs the post-season rehabilitation program for S&IC equipment.

2.2.17.2. Provides around-the-clock support during S&IC operations.

2.2.17.3. Provides around-the-clock support to snow removal operations for the maintenance and repair of all S&IC vehicles, including immediate repair response for all breakdowns that occur during snow and ice removal operations; coordinates the start and end dates of the post-season rehabilitation program response with civil engineers and S&IC.

2.2.17.4. Establishes minimum stock levels of vehicle parts for S&IC vehicles.

2.2.17.4.1. **(Added-8FW)** Provides mobile vehicle refueling within 30 minutes after request by S&IC to keep equipment-refueling time to a minimum during periods of snowfall.

2.2.17.5. Promptly procures requested equipment and supplies for S&IC.

2.2.17.5. **(8FW)** Works with 8 CES to identify and order all parts and supplies identified on the "Special Level" listing for the up-coming snow season by 1 July each year. Ensures sufficient stocks of snow removal supplies (e.g., potassium acetate & vehicle parts) are available before 30 October, and work to sustain those stocks throughout the snow season.

2.2.17.6. Provides minimum special levels of spare parts for S&IC equipment.

2.2.17.7. Provides priority fuel support to airfield snow removal equipment on site as requested.

2.2.18. Safety:

2.2.18.1. Reviews the S&ICP to ensure planned operations are safe (in accordance with paragraph 3.1.2).

2.2.18.2. Publicizes to all assigned personnel snow and ice hazard information and the precautions to take when encountering S&IC equipment.

2.2.18.3. Evaluates effectiveness of S&IC activities at maintaining or rapidly reestablishing runway conditions required for safe flying operations; reports any recommendations to the S&ICC.

2.2.19. **(Added-8FW)** Korea Airport Authority:

2.2.19.1. **(Added-8FW)** The Korea Airport Authority is responsible for removing snow at no cost to U.S. Forces Korea (USFK) or the U.S. Government (USG) on the taxiway beyond the perimeter fence, (electric gate) and other facilities constructed to accommodate the civil aircraft operations, per the Memorandum of Agreement between USFK and the ROK Ministry of National Defense.

Chapter 3

SNOW AND ICE CONTROL (S&IC) PREPARATIONS

3.1. Operator Readiness.

3.1.1. **Training.** Give higher priority to training after winters with below-average snowfall. Provide the following:

3.1.1.1. VLC training: <https://afcesa.csd.disa.mil>. Ensure each member of the S&IC team reviews the training course “Snow and Ice Control Techniques” at least once prior to the beginning of the snow season. The service provider will ensure snow removal operators are adequately trained, the training is documented, and training is reviewed annually.

3.1.1.2. Formal classroom lectures, discussion periods, and Web-based training.

3.1.1.3. Provide hands-on operation training for all S&IC equipment. Perform practice runs with the equipment using typical operation scenarios. Substitute water for liquid deicers to reproduce realistic operations.

3.1.1.4. Contracted operations must be familiar with the S&ICP and will follow the requirements of the specific S&ICP for the installation as approved by the BCE.

3.1.1.5. Instruct all operators on effective and efficient anti-icing/deicing methods with minimal chemical use. Instruction must cover chemical usage issues, personal safety, P2/BMPs, environmental impact, and impact on aircraft, weapon systems, and airfield infrastructure.

3.1.1.6. Tabletop exercises using miniature equipment on airdrome layouts to simulate operations and reduce training costs.

3.1.1.7. Operator maintenance responsibilities, including fuel, fluid, supply locations, repair techniques, and heavy equipment maintenance reporting procedures.

3.1.1.8. Instruct the operators on communication procedures and right-of-way information. Each operator must be trained on the procedures to follow if the radio signal is lost between the operator, snow control, the control tower, and the airfield snow removal lead.

3.1.1.9. Details of the S&ICP, emphasizing the order of priorities.

3.1.1.10. Conduct both a daytime and nighttime airfield and base familiarization tour, highlighting locations where problems are likely. The airfield and base familiarization tour should identify such obstructions as aircraft airfield lighting systems, aircraft arresting cables and recessed arresting systems, aircraft fuel hydrant and valve pits, fire hydrants, railroad crossings, utility holes, curb and gutter systems, and any other obstructions that may be covered and difficult to see during snow removal operations.

3.1.1.11. Define the following information: duty location, duty hours, duty uniform, shift schedules, and notification procedures.

3.1.1.11. **(8FW)** Heavy Repair personnel combined with augmentees from 8 CES will be required to support snow removal operations. The personnel identified as augmentee

should not have a DEROS earlier than 1 April each year. Snow removal augmentees will be utilized based on amount of snowfall predicted or accumulated or as directed by 8 CES Operations Flight Commander. All snow removal personnel will attend a snow and ice removal-training course. This course will be an orientation course to train personnel in basic concepts of snow and ice removal and operation of snow removal equipment.

3.1.1.12. Permit attendance at technology-sharing seminars and workshops with other military bases and governmental agencies (e.g., Snow Symposium in Buffalo, New York).

3.1.1.12. **(8FW)** Normal manning will be postured to support a 24-hour-capable snow removal operation. When a weather advisory/warning/watch for snow accumulation or weather warning for freezing precipitation is issued, the Horizontal NCOIC (8 CES/CEOHH) will posture snow removal shifts. Snow shifts will operate from 0600 to 1800 and from 1800 to 0600. All assigned personnel will report to Building 780 at least 30 minutes prior to their shift time. The 12-hour shifts apply to all Snow and Ice Control personnel assigned snow removal duties.

3.1.1.13. **(Added-8FW)** All military and civilian personnel assigned snow removal duties will work their normal duty hours when snow removal operations are not required or are not anticipated. Upon receipt of advisory/warning/watch for snow or freezing precipitation, 8 CES/CEOHH will initiate notification procedures through other superintendents to release augmentees assigned to night shifts for crew rest. Due to different notification times, specific guidance for reporting will be given from CEOHH/NCOIC.

3.1.1.14. **(Added-8FW)** Utilizing of KN workforce will be in accordance with the applicable provisions in USFK Reg 690-1. Civilian employees will be used primarily on the main base and munitions area to remove snow on roads and sidewalks.

3.1.1.15. **(Added-8FW)** Prior to conducting snow removal activities, all personnel must possess a valid flightline driver's license and restricted area badge for Kunsan AB.

3.1.2. **Safety and Health.**

3.1.2.1. Units must comply with all vehicle licensing, personal protective equipment, and medical requirement policies. All equipment operators, military or civilian, must meet minimum training requirements before licensing. Employ over-hires early enough to allow time for medical clearance examinations and operator training.

3.1.2.2. S&IC operations and working conditions are hazardous. Anticipate damage to snow equipment and attachments due to hidden obstructions; damage can be minimized by educating operators ahead of time on these hidden hazards. Ensure all personnel comply with established safety procedures when operating deicing equipment.

3.2. Snow Removal Readiness. All equipment must be mechanically sound and operational by 1 September. Equipment status must be available for the pre-season meeting. Heated storage facilities should be used to increase equipment life, reduce maintenance costs, and ensure rapid response.

- 3.2.1. Perform pre-season operational checks, including practice runs that resemble real winter operations as closely as possible. Report all discrepancies to logistics (vehicle maintenance) for corrective actions.
- 3.2.2. Install, inspect, and perform operational tests on all snow control radios.
- 3.2.3. Conduct run-up and operational checks when the temperature drops below freezing.
- 3.2.4. Adjust and calibrate all S&IC equipment attachments. Load ballast and install tire chains (if necessary) prior to S&IC operations.
- 3.2.5. Equip each unit with required support materials such as shovels, shear pins, ice scrapers, fire extinguisher, and tool kits as required.
- 3.2.6. Use wear-resistant tungsten carbide cutting edges to reduce maintenance. **CAUTION:** Tungsten carbide cutting edges may be incompatible with some in-pavement lighting fixtures.
- 3.2.7. Use broom cores with steel or poly bristles, or a combination of both. **CAUTION:** Loss of steel bristles increases foreign object damage (FOD) potential, so minimize loss by trying various brands and storing snow brooms indoors. It is not necessary or cost-effective to replace steel bristles with poly bristles until after they are worn down. Magnetic sweepers should be used to remove steel bristle residue from the airfield.
- 3.2.8. Place vehicle call signs, airfield and base maps, snow removal priorities, operator manuals, and/or spreader settings in the equipment for the operator's reference.
- 3.2.9. **(Added-8FW)** 8 CES/CEOHH will conduct dry runs, inspect equipment, and hold orientation sessions for all operators before 1 November each year. They will ensure all personnel are familiar with specialized maintenance requirements of snow removal equipment and adjustments for all sweepers, snowplows, and sanders. They will also equip all snowplows with ballast, tow cables, and shovels.

3.3. Obtaining Materials and Parts. The heavy repair superintendent procures adequate shop stocks of S&IC supplies by 15 September each year. Establish minimum levels for each item, arrange for on-call items, and identify shortages by 31 May each year.

3.4. Protecting Air Force Property. The heavy repair superintendent specifies "safety zones" around key assets and includes this information in the S&ICP. Snow removal vehicles will not operate within these safety zones.

3.4.1. **Environment.** The heavy repair superintendent works cooperatively with the asset management flight chief to ensure applications of anti-icing/deicing agents are in accordance with local, state, and Clean Water Act (CWA) SW provisions. The military family housing privatization project owner (MFHP PO) must comply with all applicable laws including CWA SW provisions. The Air Force assumes no enforcement or supervisory responsibilities. The MFHP PO shall be liable for all costs associated with compliance.

3.4.2. **Infrastructure.** Infrastructure crews mark all obstructions that could damage or be damaged by S&IC equipment. During the pre-season inspection, emphasis must be placed on marking drainage culverts, catch basins, manhole covers, fire hydrants, airfield lighting, electrical/electronic equipment enclosures, parking lot edges, curbs, and roadway drop-offs.

3.4.3. **Airfield Lighting.** Non-metal markers may be used to identify taxiway lights. FAA AC 150/5345-53C, *Airport Lighting Equipment Certification Program*, provides the name and address of marker manufacturers (these manufacturers do not supply markers suitable for identifying taxiway lights buried in snow). If you experience excessive damage to in-pavement taxiway lights, consider purchasing "snowplow-resistant" lighting. Also watch for corrosion and deterioration of underground cables that may result from long-term or excessive use of non-urea ice control chemicals.

3.4.4. **Facilities.** S&IC equipment operators will maintain sufficient clearance around facilities to prevent damaging the facility and/or snow removal equipment. Operators will observe the safe clearance distances as specified in the installation's S&ICP.

3.5. Streamlining Operations. Civil engineer personnel should be aware of snow removal physical constraints. Bumper blocks, elevated utility manholes in pavements, congested or enclosed parking arrangements, lack of road shoulders, and dead-end or cul-de-sac streets can severely hamper operations. Minimize these adverse conditions through continuous and coordinated communication. The programs flight chief and chief of the project management element shall coordinate maintainability checklists and drawings for upcoming projects with operations flight S&IC equipment operators.

3.6. S&IC Monitoring Systems.

3.6.1. Reviewing Runway Ice Detection Systems (RIDS).

3.6.1.1. **Using Sensors.** Sensors embedded in the pavement measure surface conditions. These devices precisely measure the pavement temperature, indicate the presence of water or ice, and provide information to choose the most appropriate S&IC strategy.

3.6.1.2. **Influencing Factors.** Many factors influence the formation of ice on pavements, including pavement temperature, surface color and composition, wind, humidity, solar radiation, traffic, and residual deicing chemicals. Air temperature is not an accurate gauge of pavement surface conditions. Knowing the direction and rate of change of pavement temperature can predict ice formation. Sensors are particularly valuable in timing anti-icing applications of chemicals. As ice or compacted snow accumulates on the pavement, knowing the pavement temperature and anti-icing/deicing chemical factors allows the SCC to determine what method will be most effective with the least amount of material.

3.6.1.3. **Pre-season Checks.** Check systems before the season starts to make sure that routine maintenance was done and that systems work. Replace all required filters and clean the sensor pins.

3.6.2. **Mobile Pavement Temperature Sensors.** There are several different models of mobile temperature sensors used for ice control. Some instruments mount to the underside of the vehicle and scan the pavement as the vehicle passes over it. Another model can be mounted to the mirror bracket and gives both pavement and outside air temperatures. These systems are equipped with a dash-mounted light-emitting diode (LED) display presenting continuous readings of the surrounding conditions.

3.7. Establishing the Snow Control Center (SCC). The SCC is a focal point for all S&IC activities. Equip the SCC with:

- 3.7.1. At least two class “A” telephone extensions for calling snow removal personnel.
- 3.7.2. At least one radio transceiver or remote. A dedicated net channel should be established for snow removal communications, when possible.
- 3.7.3. Dispatch boards displaying the nomenclature, vehicle registration numbers, operator, vehicle status, radio call sign, vehicle’s dispatched location, and any comments.
- 3.7.4. Airfield and main base maps with color-coded priorities, status, and runway surface conditions.
- 3.7.5. All required publications, including this instruction and the S&ICP.
- 3.7.6. Personnel rosters showing duty status and recall information.
- 3.7.7. Charts identifying current weather conditions and the forecast.
- 3.7.8. Alternate sources of equipment and personnel to support contingencies. Include instructions for renting equipment or Department of Defense (DOD) mutual support agreements with regional active or reserve units.
- 3.7.9. **(Added-8FW)** SCC is located in 8 CES/CEOHH, Bldg 780, at 782-5020 or 5188. The SCC will be manned 24 hours per day from 1 November through 1 April each year. When snow removal is not required, two rotating teams will be on standby for snow removal, with one team on call for first response seven days a week, 24 hours per day, throughout the snow season. The SCC is the focal point for all S&IC activities.

Chapter 4

SNOW AND ICE CONTROL OPERATIONS

4.1. Snow Removal Procedures.

4.1.1. **Basic Guidelines.** When snow removal conditions warrant SCC activation, the heavy repair superintendent will assume control authority for snow control operations for both the airfield and main base. The severity of the snowstorm determines the size of the area on which they will focus. Follow these general guidelines:

4.1.1.1. Reduce operations and concentrate on keeping the center of the runway and taxiways clear when snow accumulation prevents clearing the entire area.

4.1.1.2. Use snowplows in tandem to move snow into windrows. Snow blowers can be used to cast windrowed snow over the edge lights. Include the overruns with the runway plow patterns; as a rule, unless required for runway operations, overruns will not be cleared before primary taxiways.

4.1.1.3. Clear enough area to leave room for clearance by aircraft wings and engines. Base aircraft should be used to determine permissible snow depth beyond the shoulders of the runways/taxiways.

4.1.1.4. Glide slope critical areas require specific snow depths to prevent signal loss. Reduce profile height to help in future operations. Keep runway and taxiway lights uncovered.

4.1.1.5. Snow windrow heights should be kept to a minimum to prevent interference with aircraft operating on the flightline. Snow removal operators should keep windrow heights to a minimum and ensure sufficient clearance is maintained between the distances of the runway edges, taxiways, and parking aprons to ensure aircraft will not be affected by snow obstruction.

4.1.1.5. **(8FW)** Removing Snow from the Airfield: Sufficient manpower and equipment should be available to conduct simultaneous operations on both the airdrome area and the base roads and streets. Support of the flying mission will take precedence over all other activities.

4.1.1.6. **(Added-8FW)** Snow berms/windrow heights will not exceed 30 inches and must be placed in a location not to interfere or impede airfield operations on runways, taxiways, or aprons. Airfield management will inspect snow berms/windrow heights during airfield checks/inspections to prevent violations of airfield/air space criteria.

4.1.2. **Maintaining Communications.** All personnel operating in the controlled movement area will maintain two-way radio communication with the control tower. Radios equipped with headsets may be used to offset the high noise levels generated by snow removal equipment. Control tower requests to clear off the runway must allow enough time for the snow team supervisor to physically check the entire runway. The S&ICP must outline specific procedures when the radio signal is lost between the control tower and a snow removal vehicle operator. All operators must be trained in these specific procedures.

4.1.3. **Determining Right-of-Way.** Some snow removal equipment operates at high speeds and will not comply with normal airfield/flight-line speed limits. Vehicles not actively involved in snow removal operations will yield the right-of-way to snow removal equipment.

4.1.3.1. **(Added-8FW)** Determining right-of-way. Snow removal techniques are necessarily high speed and cannot always comply with airfield speed limits. Control tower personnel, other vehicle operators, and aircraft ground maintenance personnel should consider snow and ice removal equipment as emergency response vehicles when operating on airfield and should give right-of-way on the airfield as well as the intersection of Avenue "B" and Taxiway "C" & "F".

4.1.4. **Following General Procedures.** While conditions at individual bases vary widely and may require special S&IC techniques and equipment, follow general procedures as closely as possible. Wind speed and direction will determine the actual runway clearing pattern. For normal operations:

4.1.4.1. When possible, start at the center of the runway and work outward to the shoulders.

4.1.4.2. Use snow brooms throughout the snowfall to clear the middle of the runway down to bare pavement, regardless of the rate of snowfall.

4.1.4.3. Broaden snow removal efforts to include the entire primary runway during light-to-moderate snowfall. Use displacement plows and snow blowers to remove the windrows accumulated by the sweepers.

4.1.4.4. Concentrate all efforts on keeping the center portion of the runway clear during heavy snowfalls. **Note:** Do not overlap longitudinal joints at the pavement crown. Use minimal down pressure when operating under-body scrapers to prevent the peeling of joint material and creating spall damage.

4.1.5. **Managing Vehicle Flow.** Equipment operating in snow removal operations must maintain a safe working distance between vehicles to avoid possible collisions due to loss of view.

4.1.5.1. Equipment movements must be timed for an orderly turnaround and safe reentry at the start of each pass.

4.1.5.2. Unnecessary radio traffic must be reduced on the snow control frequency during runway snow removal operations. Snow removal transmissions will have priority on a multiple-user net.

4.1.6. **Crosswind Operating Conditions.**

4.1.6.1. Begin clearing the snow from the upwind side of the runway.

4.1.6.2. The wind will help move the snow across the runway if time and aircraft operations permit. After beginning the clearing pattern, continue it for the entire width of the runway to avoid obscuring the runway centerline or leaving a windrow on the runway.

4.1.6.3. Advise the control tower and AM personnel before beginning crosswind snow removal operations.

4.1.6.4. Inform the control tower of any hazards such as windrows, snow banks, and slush if clearing operations must be stopped before finishing the entire runway width.

4.1.7. **Runway Edge Lights.** Keep runway edge lights clear to give runway clearance for aircraft movements.

4.1.8. **Semi-Flush, In-Pavement Lights.** Operators should be careful when operating a snowplow over these lights. Adjust blade height to clear the lights. When possible, use snowplows equipped with polymer or rubber blades or a snow broom. Polymer blades may reduce collateral damage but are not economical for all plowing conditions.

4.1.9. **Aircraft Arresting Systems (AAS) Area.** Prior to starting snow-clearing operations, personnel will deactivate AAS and remove the pendant and barrier. Remove enough snow to allow full use of the AAS. Include specific techniques in the S&ICP. Use portable snow-blowing equipment and manual labor around the AAS. Use AAS maintenance or augmentee personnel for this work.

4.1.10. **NAVAIDs Instrument Landing System (ILS) Area.** Snow removal operations in the ILS area will be directed by AM. All snow removal personnel will be accompanied by at least one NAVAIDS maintenance individual that monitors and ensures adequate snow removal in the antenna and field detector areas. Include specific procedures in the S&ICP for snow removal around NAVAIDS.

4.1.10.1. **(Added-8FW)** Barrier maintenance personnel will deactivate, remove, and mark pendants from barriers located on the runway prior to snow removal operations. Snow will be removed to the distance required for effective use of the barrier. Close attention will be paid to clearing tape run out areas to preclude damage to tapes. Barrier maintenance personnel will clear snow from the immediate vicinity of barrier houses. Arresting systems will be disconnected, except the north and south BAK 12/14 which must be lowered by the tower, prior to snow removal operations on the airdrome area. After snow removal operations are complete, the arresting systems will be reconnected. The shift supervisor will ensure airfield management is kept informed of arresting system status.

4.1.11. **Facility Managers.** Facility managers or OPR are tasked with clearing snow from around their facility using shovels, small rotary blowers, or small tractor-mounted plows. This includes removing snow from areas around aircraft hangars and shelters, grounding points, parked aircraft (within defined safety zone), NAVAIDs, AAS building, and other areas that cannot safely be cleared using larger snow removal equipment. Facility managers are responsible for clearing snow from nearby fire hydrants and the faces of all facility signs. Facility managers will use only approved deicing chemicals near the airfield.

4.1.12. **Bulk Snow Removal.** If there is insufficient space for storing snow near areas to be cleared, hauling to a disposal site may be necessary. If deemed necessary, the disposal site should be selected before winter sets in and identified in the S&ICP. The selection process should consider the following as a minimum: (1) disposal sites do not compromise aircraft operations, aircraft NAVAIDs, and flight-line traffic; (2) sites have adequate drainage capability; and (3) sites offer, if required, environmental mitigation of captured chemicals. MFHP PO or OPR is tasked with clearing snow from roads, streets, sidewalks and common

areas in accordance with the MFHPTD. PO will use only approved deicing chemicals near the airfield.

4.1.12.1. **(Added-8FW)** Facility occupant, manager, or office of primary responsibility will remove snow within 25 feet around aircraft hangars and shelters, grounding points, within 25 feet of parked aircraft, navigational aids, arresting system building, and other areas that cannot safely be cleared using snow removal equipment.

4.1.13. **Temporary Airfield Markings.** Where white markings do not provide the required contrast (i.e., snow-covered surfaces), a colored dye such as sea-marker dye (yellow-green or yellow-orange) must be used. The AFM will specify where to put the markings.

4.2. Airfield Ice Control. The BCE will select individuals in the S&IC chain of command to make airfield pavement deicing decisions. Selection will be based on duty position, experience, and environmental awareness. The decision to use ice control chemicals will be based on the weather forecast, flying schedule, and environmental considerations. The SCC should carefully monitor both use and issue of ice control chemicals and log the quantities and locations used. Refer to paragraph 5.4.

4.2.1. **Knowing How Ice Forms.** S&IC teams must know the various conditions that cause ice to form. Freezing rain, frozen water vapor and fog, freezing surface water, compacted snow, and the thawing and re-freezing of snow may all lead to hazardous pavement surfaces. Do not use chemicals during the early stages of dry snowfall or while snow is blowing since the melting ability of these chemicals may actually increase ice formation.

4.2.2. **Mechanically Controlling Ice.** Using S&IC monitoring systems, anti-icing methods, and the "bare pavement" concept for the runway should minimize ice accumulation. When ice forms:

4.2.2.1. Use under-body scrapers or graders for scraping ice to less than 3.2 millimeters (0.125 inch) before using deicing chemicals. Minimal down pressure should be used when operating under-body scrapers to minimize the peeling of joint material and spall damage.

4.2.2.2. Remove slush or soft ice with rubber cutting edges.

4.2.2.3. Use serrated cutting edges to cut longitudinal grooves in hard ice to help hold chemicals and improve traffic control.

4.2.2.4. Use caution with rotary snow brooms on hard-packed snow and ice. In some cases, the snow broom may glaze or "polish" the ice and further reduce traction. Steel snow broom bristles help cut ice; poly bristles are best for "flipping" snow.

4.2.3. **Ice-Control Chemicals.** Use only installation-approved chemicals on the airfield for anti-icing/deicing. Consult your installation's asset management flight chief to ensure products comply with all federal, state, and local environmental policies. Hazardous material purchases and accumulation of expired shelf life materials should be minimized. **CAUTION:** The National Stock Number (NSN) for ice control chemicals is a generic stock number encompassing all anti-icing/deicing chemicals. Installations must ensure all deicing chemicals are compatible when purchasing additional chemicals.

4.2.4. **Anti-icing/Deicing Chemicals Storage.** Anti-icing/deicing chemicals should be stored in an enclosed shelter, if possible. A properly stored anti-icing/deicing chemical

reduces product degradation caused by exposure to the weather. Storing solids or abrasives under shelter prevents moisture absorption that may freeze the stockpile in cold weather. Liquid ice-control chemicals stored in tanks must comply with AFI 32-7001, *Environmental Management*. Potassium acetate chemicals should be stored in polyethylene or stainless-steel tanks. Use of potassium acetate as an anti-icer is recommended as an excellent means of reducing total chemical usage (refer to paragraph 4.2.7 and paragraph A2.2.1).

4.2.5. Environmental Impact. Minimize use of ice control chemicals to protect the environment, aircraft and weapon systems, and airfield infrastructure, weapon storage areas (WSA), missile alert and launch facilities, and to control the cost of airfield deicing activities.

4.2.5.1. If available, use runway ice-detection systems and mobile temperature sensors so teams can use anti-icing techniques rather than deicing.

4.2.5.2. Minimize use of glycols and urea-based products. Rely on alternative materials that are safer for the environment, such as potassium acetate, sodium formate, and sodium acetate. Excessive glycol and urea use could degrade waterways. **CAUTION:** Ensure potassium acetate is used as recommended by the manufacturer. There are documented cases of potassium acetate causing increased groundwater contamination and adversely effecting underground electrical circuits where the insulation is in poor condition (see Attachment 2).

4.2.5.3. Some deicers may cause light scaling of Portland cement concrete (PCC) by physical action related to the chemical concentration gradient in the pavement. If it can be avoided, do not apply ice control chemicals to new PCC pavements for the first year.

4.2.6. Dispensing Anti-icing/Deicing Chemicals.

4.2.6.1. Solid Chemicals.

4.2.6.1.1. Use a suitable dispenser. For uniform coverage on the airfield, material spreaders with capacities between 5 and 7 cubic yards are needed to accurately dispense chemicals. The dispenser must apply a uniform pattern at various density settings and speeds. Caution should be taken with some non-urea solids, such as sodium formate, which tend to form clumps; these should be applied with equipment designed to break up the clumps.

4.2.6.1.2. Use solid chemical dispensers with pre-wetting capability when possible. Pre-wetting solid deicers with approved liquid deicers is much more effective at low temperatures and prevents the solid deicers from being blown away by high winds. The recommended application rate in pre-wetting is 10.4 liters per 1,000 kilograms (1.25 gallons per 1,000 pounds) of deicer.

4.2.6.1.3. Use waterproof covers to prevent the chemical from absorbing moisture while in storage.

4.2.6.2. Liquid Chemicals. Computer-controlled and -calibrated sprayer units should be used whenever possible to minimize chemical usage while maximizing the chemical's effect. Trucks equipped with tanks and spray bars can be used to dispense liquid chemicals. The spray bar and nozzles should cover well without runoff. Portable towed tanks and water distributors may also be used, but these will require flushing if used for multiple activities. Ensure spreaders are capable of accurately dispensing liquid

chemicals while traveling at various speeds. Installations using large quantities of chemicals should consider procuring precision application equipment to improve the effectiveness and efficiency of the chemicals applied. Contact your MAJCOM for guidance on procuring airfield deicing chemical application equipment.

4.2.7. **Anti-Icing.** Whenever possible, S&IC teams should emphasize anti-icing rather than deicing, especially on installations that have runway ice-detection systems. Direct the primary ice-control efforts toward keeping ice from bonding to pavements. Anti-icing requires applying liquid deicing chemicals at a rate of 1.2 liters per 100 square meters (0.3 gallon per 1,000 square feet) just before freezing conditions occur. Chemicals in liquid form are most effective for anti-icing. Dry, solid chemicals applied to a cold, dry surface will not stick, and surface winds or aircraft may scatter it, severely reducing its effectiveness and impacting the environment. Solid chemicals may be used as an anti-icer, but must be used with a liquid to enhance the bonding action between the chemical and the pavement.

4.2.8. **Deicing.** Deicing may require up to five times the quantity of chemical as anti-icing. After applying the deicer, the chemical must be allowed to react and take effect. After the chemical begins its brine action, remove the ice and snow with rotary snow brooms or snowplows.

4.2.9. **Abrasives.** Use abrasives (sand) only in emergency conditions to improve traction on airfield surfaces. Excerpts from FAA AC 150/5200-30C for abrasives use is stated in paragraphs 4.2.9.1 and 4.2.9.2.

4.2.9.1. All sands do not perform the same. In general, the greater the quantity of sand applied, the greater the increase in traction. Fine sands show superior performance on warmer ice (>20 Fahrenheit [$^{\circ}$ F] [-7 Celsius ($^{\circ}$ C)]), while coarser sands show superior performance on colder ice (<15 $^{\circ}$ F [-9 $^{\circ}$ C]). For the purpose of this guidance, sand retained on a #30 sieve is considered “coarse,” and sand passing through a #30 sieve is considered “fine.”

4.2.9.2. Table 4.1 provides the standard gradation for sand. Friction-improving material applied to airfield pavements will consist of washed granular particles free of stones, loam, clay debris, and chloride salts or other corrosive substances. The pH of the water solution containing the material must be approximately neutral (pH 7). Material must meet the following gradation using standard sieves conforming to American Society for Testing and Materials (ASTM) E11, *Standard Specification for Woven Wire Test Sieve Cloth and Test Sieves*.

Table 4.1. Standard Gradation for Sand.

Sieve Designation	Percent by Weight Passing
0.04	100
8	97–100
16	30–60
50	0–10
80	0–2

4.2.9.3. It is recommended that bases coordinate with their local airframe manager to ensure that the proper grade material is used for the aircraft at their installation.

4.2.10. **Grooving Pavement.** Cutting grooves into the pavement is an option that will aid in trapping deicing chemicals, reducing loss, and prolonging the melting action. Grooving also helps drain melted water and reduce re-freezing.

4.3. Controlling Snow and Ice on Roadways, Parking Lots, Housing, and Other Areas. Remove snow from these areas to allow normal base activity to proceed with minimum delay. When possible, work during non-peak hours to avoid congestion. **CAUTION:** Agents not authorized for use on runways must not be used on any roadways within 90 meters (300 feet) of runways, taxiways, or parking aprons to prevent tracking these agents onto surfaces used by aircraft. **Note:** All chemical agents used on roadways must conform to local environmental standards. To ensure environmental compliance, coordinate with and obtain approval from the asset management flight chief.

4.3.1. **Roads and Streets.** Plow from the center of the road, pushing the windrow to the shoulder. In heavy-accumulation regions, use rotary snow blowers to clear shoulders and sidewalks.

4.3.2. **Parking Lots.** The heavy repair superintendent, security forces, and facility managers will decide when and which parking lots will be closed for snow removal clearing. If required, the S&ICP should address the need for temporary parking areas. Use local media to publicize parking arrangements.

4.3.3. **Housing and Other Areas.** The S&ICP will specify the snow removal responsibilities of the occupant and facility manager for sidewalks, entrances, fire hydrants, and loading ramps. The S&ICP will specify the snow removal responsibilities of the occupant, facility owner, and MFHP PO for sidewalks, entrances, fire hydrants, and loading ramps in accordance with the MFHPTD.

4.3.4. **Ice Control.**

4.3.4.1. **Chemicals Use.** All approved anti-icing/deicers should be used as little as possible. Chemicals should be properly stored to prevent contamination. Environmental contamination is most likely at storage sites. The organization storing mission-essential anti-icing/deicing chemicals will be responsible for the clean-up of any environmental contamination. Keep deicer chemicals dry to prevent ground or surface water contamination. Additional information concerning anti-icing/deicing chemicals is in Federal Highway Administration (FHWA) *Manual of Practice for an Effective Anti-icing Program*, located at <http://www.fhwa.dot.gov/reports/mopeap/mop0296a.htm#eap22>. Use chlorides as follows:

4.3.4.1.1. Use sodium chloride (rock salt) and calcium chloride to de-ice non-airdrome areas. Because they are corrosive, use them away from aircraft movement areas, WSA, and missile launch facilities.

4.3.4.1.2. Use sodium chloride (with or without added liquid calcium chloride) to de-ice base areas; it is cheap and effective.

4.3.4.1.3. Use calcium chloride instead of sodium chloride at lower temperatures. Pre-wetting will make it more effective. Use chloride-based deicers with corrosion inhibitors on bridges or other structures.

4.3.4.1.4. Use magnesium chloride as an anti-icer or deicer. It is less toxic to plant life and less corrosive to concrete and steel (and other iron alloys) than sodium chloride. The use of magnesium chloride improves driving conditions during and after freezing precipitation, but may damage underground electrical systems.

4.3.4.2. **Abrasives.** Use sand and cinders to increase vehicle traction. Add between 5 and 15 percent chloride by weight to sand to improve traction and help melt ice. Abrasives may improve traction on icy pavements; however, heavy applications can insulate the ice and keep it from melting. It may also degrade air quality in windy locations and lead to drainage problems. Drainage inlets should be routinely cleared to avoid flooding when the ice and snow melt. Abrasives can degrade stream quality and exceed the total suspended solids (TSS) allowed to be discharged into streams and waterways; solids are the main cause of water pollution.

4.3.4.3. **Ethylene Glycol.** Ethylene glycol will not be used for any deicing activities because of its highly toxic nature.

4.3.5. **Snow Removal Equipment.**

4.3.5.1. **Main Base.** Caution must be used when assigning airfield snow removal equipment to the main base and should be done only in emergencies. Use dump trucks with reversible plows, road graders, loaders with buckets or plows, deicing chemical dispensers, and attachments on other equipment to clear areas. This equipment should only be used during low-traffic periods and must be monitored closely.

4.3.5.2. **Snow Brooms.** Snow brooms are prohibited from being used on base streets due to the size of the equipment and the danger of flying bristles. Additionally, there are numerous obstructions that cannot be seen due to limited operator visibility.

4.3.5.3. **Other Uses.** Ideally, S&IC equipment should only be used for snow and ice removal. However, the BCE may authorize using snow removal equipment for non-S&IC activities, such as snow brooms for runway rubber-removal operations, as long as normal precautions are taken and the operation does not damage the snow removal equipment.

Chapter 5

POST-SEASON ACTIONS

5.1. Implementing Lessons Learned. The operations flight commander will review the activity logs at the end of the snow season, determine the problems and successes, and incorporate improvements into the revised S&ICP. Use P2/BMPs proactively to minimize or eliminate problems. Begin preparations for the next snow removal season at the end of the current season.

5.2. Reconditioning Snow Removal Equipment. At the end of the snow removal season, all S&IC equipment must be scheduled for reconditioning in preparation for the next snow season. The heavy repair superintendent, or designee, in conjunction with the logistics readiness squadron (LRS), coordinates, thoroughly inspects, repairs, and stores all S&IC equipment scheduled for reconditioning. Replacement parts should be identified and ordered immediately so the equipment will be ready for the next snow season. The vehicle control officer or noncommissioned officer (NCO) will brief the staff on the status of snow removal equipment at the commander's update briefings.

5.3. Repairing Real Property. Complete normal end-of-season activities, such as storing snow fence and snow markers. Inspect all pavement surfaces for damage caused by snow removal equipment. An evaluation of the airfield lighting, AAS, base signs, grounds, and security fences should be conducted for possible damage. Schedule repairs based on local priorities.

5.4. Tracking Chemical Consumption. Each installation is responsible for tracking the consumption of deicing chemicals and abrasives used on their airfields, streets, parking lots, and sidewalks. Airfield and street consumption should be accounted for separately. This information should be available at all times for use by the asset management flight chief, MAJCOM, or higher agencies. The following information is required when collecting this data:

- 5.4.1. Each type of deicer and/or abrasive used.
- 5.4.2. Quantity of each deicer and/or abrasive used.
- 5.4.3. Unit of issue.
- 5.4.4. Unit price.
- 5.4.5. Method of procurement.
- 5.4.6. Total inches of snowfall for the past winter.

- 5.4.7. Total number of ice events/storms.
- 5.4.8. Total square yards of airfield.
- 5.4.9. Total square yards of street and parking lot pavement.
- 5.4.10. Total number of sorties flown.

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Attachment 1**GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

AFI 10-206, *Operational Reporting*, 6 September 2011

AFI 13-204V3, *Airfield Operations Procedures and Programs*, 1 September 2010

AFI 32-7001, *Environmental Management*, 4 November 2011

AFI 33-106, *Managing High Frequency Radios, Personal Wireless Communication Systems, and the Military Affiliate Radio System*, 9 January 2002

AFMAN 33-363, *Management of Records*, 1 March 2008

AFMS 44EO, *Operations Flight*

AFFD 32-10, *Installations and Facilities*, 4 March 2010

AFFD 32-70, *Environmental Quality*, 20 July 1994

AS 010, *Vehicles Owned by the United States Air Force for Permanent Bases*, 2009

AS 464, *Civil Engineer – Operations Flight Support Equipment*

ASTM E11, *Standard Specification for Woven Wire Test Sieve Cloth and Test Sieves*, 2009,
<http://www.astm.org/index.shtml>

FAA AC 150/5200-30C, *Airport Winter Safety and Operations*, 9 December 2008,
http://www.faa.gov/airports/resources/advisory_circulars/

FAA AC 150/5220-20, *Airport Snow and Ice Control Equipment*, 30 June 1992

FAA AC 150/5345-53C, *Airport Lighting Equipment Certification Program*, 30 September 2005

FHWA *Manual of Practice for an Effective Anti-Icing Program*, June 1996,
<http://www.fhwa.dot.gov/reports/mopeap/eapcov.htm>

SAE AMS 1431C, *Compound, Solid Runway and Taxiway Deicing/Anti-Icing*, September 2010

SAE AMS 1435B, *Fluid, Generic, Deicing/Anti-Icing Runways and Taxiways*, September 2010

TO 33-1-23, *Equipment and Procedures for Obtaining Runway Condition Readings*, 30 November 2006

TO 42C-1-2, *Anti-Icing, Deicing, and Defrosting of Parked Aircraft*

Prescribed Forms

None

Adopted Forms

None

Abbreviations and Acronyms

°C—degree Celsius

°F—degree Fahrenheit

AAS—aircraft arresting system

AFCESA/CEO—Air Force Civil Engineer Support Agency, Operations and Programs Support Division

AFCESA/CEOO—Air Force Civil Engineer Support Agency, Operations and Force Management Division

AFCESA—Air Force Civil Engineer Support Agency

AFI—Air Force instruction

AFM—airfield manager

AFMAN—Air Force manual

AFMS—Air Force manpower standard

AFPD—Air Force policy directive

AFRC—Air Force Reserve Command

AM—airfield management

AMOPS—airfield management operations

AMS—Aerospace Material Specification

ANG—Air National Guard

AS—allowance standard

ASC—Aeronautical Systems Center

ASM—aircraft single manager

ASTM—American Society for Testing and Materials

ATCT—air traffic control tower

BCE—base civil engineer

CoP—Community of Practice

CWA—Clean Water Act

ESOH—environmental, safety, and occupational health

FAA AC—Federal Aviation Administration Advisory Circular

ILS—instrument landing system

MAJCOM/A3—major command directorate of operations

MAJCOM—major command

MFH—military family housing

MFHP—military family housing privatization

MFHPTD—military family housing privatization transition documents

NAVAID—navigational aid

NOTAM—Notice To Airmen

OCONUS—outside the continental United States

OPR—office of primary responsibility

P2/BMP—pollution prevention/best management practices

PAA—primary aircraft authorization

PCC—Portland cement concrete

PFH—privatized family housing

pH—Log(base 10) of the hydrogen ion concentration; measure of the acidity or basicity of a solution

PO—project owner

RCR—runway condition reading

RSC—runway surface condition

S&ICC—snow and ice control committee

S&ICP—snow and ice control plan

S&IC—snow and ice control

SAE AMS—Society of Automotive Engineers Aerospace Material Specification

SAF/AQR—Deputy Assistant Secretary of the Air Force for Acquisition (Science, Technology, and Engineering)

SCC—snow control center

SW—storm water

TO—technical order

USAF/A7CAN—Office of the Civil Engineer, Natural Infrastructure Branch

USAF/A7C—Office of the Civil Engineer

VLC—Virtual Learning Center

WSA—weapons storage area

Attachment 2

USING ICE CONTROL CHEMICALS ON AIRFIELD PAVEMENTS

A2.1. Solid Anti-Icing and Deicing Chemicals. All solid chemicals for airfield use (other than urea) must be certified to Society of Automotive Engineers Aerospace Material Specification (SAE AMS) 1431C, *Compound, Solid Runway and Taxiway Deicing/Anti-Icing*.

A2.1.1. **Urea.** Shotted or prilled urea performs well down to $-9.4\text{ }^{\circ}\text{C}$ ($15\text{ }^{\circ}\text{F}$). Carefully monitor urea usage since overuse can lead to environmental degradation. See Table A2.1 for application rates. As an example, apply no more than 11.2 kilograms of urea per 100 square meters on ice less than 0.8 millimeter (0.03125 inch) thick when pavement temperature is $-3.9\text{ }^{\circ}\text{C}$ ($25\text{ }^{\circ}\text{F}$).

Table A2.1. Urea — Kilograms per 100 Square Meters (Pounds per 1,000 Square Feet).

Ice Thickness	Pavement Temperature		
	$-1.1\text{ }^{\circ}\text{C}$ ($30\text{ }^{\circ}\text{F}$)	$-3.9\text{ }^{\circ}\text{C}$ ($25\text{ }^{\circ}\text{F}$)	$-6.7\text{ }^{\circ}\text{C}$ ($20\text{ }^{\circ}\text{F}$)
Less than 0.8 mm (0.03125 in.)	7.8 (16)	11.2 (23)	29.3 (60)
0.8 mm to 3.2 mm (0.03125 in. to 0.125 in.)	14.6 (30)	29 (60)	61 (125)
3.2 mm to 6.4 mm (0.125 in. to 0.25 in.)	61 (125)	85.4 (175)	134 (275)

A2.1.2. **Sodium Formate.** More environmentally friendly than urea, this product has been effective at temperatures as low as $-15\text{ }^{\circ}\text{C}$ ($5\text{ }^{\circ}\text{F}$), with an application rate half that of urea. It requires 90 percent less oxygen than urea to biodegrade, making it far less polluting than urea. See Table A2.2 for application rates.

Table A2.2. Sodium Formate — Kilograms per 100 Square Meters (Pounds per 1,000 Square Feet).

Ice Thickness	Pavement Temperature		
	$-1.1\text{ }^{\circ}\text{C}$ ($30\text{ }^{\circ}\text{F}$)	$-3.9\text{ }^{\circ}\text{C}$ ($25\text{ }^{\circ}\text{F}$)	$-6.7\text{ }^{\circ}\text{C}$ ($20\text{ }^{\circ}\text{F}$)
Less than 0.8 mm (0.03125 in.)	3.9 (8)	5.4 (11)	14.2 (29)
0.8 mm to 3.2 mm (0.03125 in. to 0.125 in.)	6.8 (14)	14.2 (29)	30.3 (62)
3.2 mm to 6.4 mm (0.125 in. to 0.25 in.)	30.3 (62)	42 (86)	65.9 (135)

A2.1.3. **Sodium Acetate.** Another more environmentally friendly product, sodium acetate will effectively melt ice at temperatures as low as $-12.2\text{ }^{\circ}\text{C}$ ($10\text{ }^{\circ}\text{F}$). It requires 63 percent less oxygen than urea to biodegrade, making it far less polluting than urea. See Table A2.3 for application rates.

Table A2.3. Sodium Acetate — Kilograms per 100 Square Meters (Pounds per 1,000 Square Feet).

Ice Thickness	Pavement Temperature		
	-1.1 °C (30 °F)	-3.9 °C (25 °F)	-6.7 °C (20 °F)
Less than 0.8 mm (0.03125 in.)	4.9 (10)	7.3 (15)	18.1 (37)
0.8 mm to 3.2 mm (0.03125 in. to 0.125 in.)	8.8 (18)	18.1 (37)	38.1 (78)
3.2 mm to 6.4 mm (0.125 in. to 0.25 in.)	38.1 (78)	53.7 (110)	85 (174)

A2.2. Liquid Anti-Icing and Deicing Chemicals. All liquid chemicals for airfield use (other than isopropyl alcohol and propylene alcohol) must be certified to SAE AMS 1435B, 1435B, *Fluid, Generic, Deicing/Anti-Icing Runways and Taxiways*. **CAUTION:** Do not allow any mixing or blending of deicing products from different manufacturers in storage and dispensing tanks. This could affect the chemistry of the originally certified products and the product would then require re-testing to ensure it satisfies SAE AMS 1435B.

A2.2.1. **Potassium Acetate.** Potassium acetate deicers conforming to required specifications are currently the most environmentally acceptable agents. However, potassium acetate may cause increased corrosion of certain aircraft and weapon system components and airfield infrastructure. Electrical conductivity is also a concern if potassium acetate is over-applied. It has been implicated as a contributing factor in electrical shorting of aircraft and airfield electrical systems.

Table A2.4. Potassium Acetate — Kilograms per 100 Square Meters (Gallons per 1,000 Square Feet (See Note)).

Ice Thickness	Pavement Temperature		
	-1.1 °C (30 °F)	-3.9 °C (25 °F)	-6.7 °C (20 °F)
Less than 0.8 mm (0.03125 in.)	0.44 (0.9)	0.59 (1.2)	0.88 (1.8)
0.8 mm to 3.2 mm (0.03125 in. to 0.125 in.)	0.59 (1.2)	0.88 (1.8)	1.46 (3.0)
3.2 mm to 6.4 mm (0.125 in. to 0.25 in.)	0.88 (1.8)	1.32 (2.7)	2.93 (6.0)

Note: When freezing conditions are expected, potassium acetate may be used as an anti-icer at the rate of 2 liters per 100 square meters (0.5 gallon per 1,000 square feet).

A2.2.2. **Ethylene Glycol.** Ethylene glycol will not be used for any deicing activities because of its highly toxic nature.

Attachment 3 (Added-8FW) SNOW REMOVAL PRIORITY MAP

Figure A3.1. Snow Removal Priority Map

