3. Material storage

a. Improper stockpiling of salt and other materials can cause the major portion of environmental problems associated with salt use

i. Rain and melting snow can carry salt from uncovered piles into the ground and nearby bodies of water, and possibly cause chloride build-up

ii. Clean up of such contamination, should it occur, can cost millions of dollars. Salt piles must be covered.

b. Storage Requirements

i. Section 900, *Snow and Ice Control*, in the Maintenance Administration Manual, details specifics of storing various winter maintenance materials

ii. Basic storage requirements

a) Salt must be stored on an impermeable pad and must be covered

b) Abrasives must be stored in an accessible area and must be protected from freezing

c) Liquid chemicals must be stored in a non-corrosive vessel

d) Liquid calcium and magnesium chloride require walled containment

e) No wall containment is necessary for salt brine, but protection from freezing is needed

D. Overview of Equipment Types

1. The role of equipment

a. Equipment is the foundation of a maintenance organization

i. The available fleet must be suited to the job and must be well maintained

ii. The extreme conditions experienced within winter maintenance require the highest level of equipment maintenance and attention to detail

b. While specific winter maintenance equipment types may vary considerably throughout different regions and climates, basic operation techniques remain similar in achieving anti-icing and de-icing measures

c. Common activities

i. Liquid chemical application

ii. Solid application of both dry and pre-wetted materials

iii. Plowing/snow removal

2. Typical factors influencing equipment

a. Capacity

b. Application rate and speed

c. Uniformity

d. Spread pattern

e. Manual verses automatic speed/spread controls

f. Permanent or removable equipment

E. <u>Liquid Chemical Application Equipment</u>

1. Liquid chemicals are applied using a spray bar system.

2. Applicator types

a. There are several different types of liquid applicators

Figure 12-8 Brine insert tank with spray bar

i. Applicators permanently mounted on the vehicle

ii. Applicators placed in the truck bed or temporarily attached

    a) Many slip-in units can be removed in approximately 30 minutes when additional dry chemical capacity is required, or at the end of the season

iii. Applicators towed behind the truck

iv. Large tankers

Figure 12-9 Side view of brine semi tank

Figure 12-10 Rear view of brine semi tank

3. Application methods – spray bar

a. The spray bar doesn't actually "spray" liquid chemicals

i. A stream of liquid is pumped through nozzles within the horizontal spray bar

ii. This minimizes air turbulence that might otherwise cause the liquid to disperse into the air before hitting the pavement

b. Installation of rubber flaps or inexpensive tubing directs liquid close to the pavement

c. With the typical spray bar, pumps push the liquid through nozzles in the spray bar

i. When equipped with an automatic control unit, the rate of flow automatically adjusts for traveling speed

ii. An additional bank of nozzles can be added to extend the spray width to cover two or more lanes at one time

Figure 12-11 Brine tank insert with bottom and side spray bars