

## "Electric/Electronic Equipment Protection - Commercial and Major Systems"

The following advice is provided by the Alaska Division of Homeland Security and Emergency Management.

Volcanic ash from eruptions present several classes of problems for electric and electronic systems:

Abrasion of moving parts, especially rotating elements.

Jamming of mechanical components.

Shorting or grounding of circuits.

Etching of painted and metal surfaces.

Generation of excessive heat under a blanket of dust or because of obstructed vents.

In general, the severity and frequency of such problems can be reduced through good housekeeping and sound maintenance programs. These measures apply to mechanical as well as to electrical systems. For example:

Sensitive systems should be isolated from dust.

Insulators should be kept clean.

Rubbing and brushing should be avoided.

Programs of protection or cleaning should be continuous because of the recurrence of blowing ash.

The following are confirmed by reports from power and communications organizations operating in ashfall areas. Specific difficulties to look for are:

Difficulty in operating electro-mechanical items, such as unprotected switches.

Insulator flashover (and resultant fires in wooden power poles) due to wet ash deposits.

Corrosion of copper/brass and ferrous metals by wet ash. Irrigation pump burnout due to heat buildup caused by ash deposits.

Higher rate of drive belt wear.

Suggested measures to prevent problems or reduce their severity include:

Electrically isolate all systems before attempting to clean or service them. Throw circuit breakers, not merely a wall switch.

Keep the ash out of the building. Techniques include sealing doors and windows; adding filters to air systems (caution: avoid overloading fans - place filters on intake side of fans); creating positive internal pressure by use of filtered fans; providing brushes and mats to clean people and cargo before they enter building; frequent vacuuming around entrances; and reducing traffic and the number of entrances.

Keep sealed units sealed. Many solid-state devices are well protected as is. Filters can be applied to the ducts but care must be taken to avoid overloading the fans or they could catch fire. Units not in use should be kept well sealed either in storage containers designed for the purpose or with plastic material well sealed with tape.

Blow dust off. Rubbing and brushing can damage many surfaces, but uncontrolled use of air hoses can also cause problems. 30 psi or less is generally proper for blowing items clean as more pressure may sandblast. Care must be used to avoid blowing ash onto other surfaces that should be kept clean. It is better to use a vacuum when possible. Be sure to clean or change filters and vacuum bags frequently.

Keep electric components clean. Excess heat is generated by single components such as light bulbs or small motors (in refrigerators, etc.) when blanketed with ash. This shortens operating life and can cause fires. The ash should be vacuumed or blown off (see paragraphs above for precautions). The same applies to household radios, TV's, etc. Professional maintenance may be needed if ash is heavy.

Keep insulators clean. A moderate wind will clean dry (new fallen) ash, and actually cause problems by providing a conduction path. Heavy rain washes insulators quite well but if wet ash dries in place, high pressure water streams and hand cleaning may be needed.

Keep power lines clear. Trees loaded with ash can cause interruptions in the same manner as in the case of snowfall or ice storms.

Avoid drowning out components when hosing ash off. Many exterior systems will handle rain or casual water but not hose jets. Washing automobile engines is usually safe.

Keep backup or auxiliary units protected from ash as long as possible to avoid startup problems.