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MOUNT ST. HELENS TECHNICAL INFORMATION NETWORK

federal emergency
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BULLETIN #22 - "Electric/Electronic Protection---Commercial and Major Systems"

Volcanic ash from eruptions of Mount St. Helens presents 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 foregoing are confirmed by reports from power and communications organizations operating in the ashfall area. Few actual outages have been recorded, but the potential for such problems persists. Specific difficulties reported include:

- * Difficulty in operating electro-mechanical items, such as

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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 (confirmed by laboratory tests).
- * Irrigation pump burnout due to heat buildup caused by ash deposit.
- * Higher rate of drive belt wear.
- * Contamination of protected spaces by air conditioners that use outside air.

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 dust 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; frequent vacuuming around entrances, preferably with the vacuum exhaust outdoors; and reducing traffic and the number of entrances.
- * Keep sealed units sealed. Many solid-state devices are well protected as is and most computer cabinets are sealed except for fan ducts. 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 p.s.i. or less is generally proper for blowing items clean as more pressure may sandblast. Care must be used to avoid blowing it onto other places that should be kept clean. Better yet, vacuum clean 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 dust. This shortens operating life and can cause fires. The dust 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 from most outdoor insulators. Light rain does not remove ash, and actually causes problems by providing a conducting 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 dust off. Many exterior systems will handle rain or casual water but not hose jets. Washing automobile engines is usually safe, but drying time might be needed.

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

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Sources for information used in this bulletin include:

Bonneville Power Administration
General Telephone Company of the Northwest
Pacific Northwest Bell
Washington State University