

Advice for **ELECTRONICS AND COMPUTERS**

Reducing the exposure of electronics and computer equipment to ashfall is the most effective mitigation action

Short-term Impacts

- > Ash particles may block ventilation grills and jam cooling fans, increasing operating temperatures which may in turn trigger overheating shutdowns
- > Ash (if wet) may cause short circuits across exposed electrical contacts
- > Fine wet ash is less mobile than dry ash however, so is less likely to be drawn into electronic compartments
- > Ash may affect the functionality and operation of keyboards, mice, compact disk drives and USB ports, requiring frequent cleaning
- > Hard Disk Drives are unlikely to be damaged by ash due to their robust filtering systems
- > Laptop computers are less vulnerable than desktop computers because of their smaller number of openings and lower cooling requirements

Phones & Radios

Communication is a vital part of everyday life and is critical during emergencies. Radio and telephone communications are extremely vulnerable to disruption during a volcanic ashfall and may become temporarily inoperable in areas affected by ash

Disruptions to Communications

- > Interference to radio waves due to atmospheric conditions
- > Overloading of telephone systems due to increased demand,
- > Direct damage to communication facilities
- > Indirect impacts can also occur from disruption to electricity supplies or when maintenance workers are unable to travel to remote sites

LONGER-TERM EXPOSURE (MONTHS TO YEARS) MAY CAUSE MORE SIGNIFICANT DAMAGE, SUCH AS CORROSION DUE TO THE REACTIVE SURFACE CHEMISTRY OF VOLCANIC ASH.

ASHFALLS OF ONLY A FEW MILLIMETERS DEPTH WILL GENERATE LARGE VOLUMES OF ASH FOR COLLECTION AND DISPOSAL

DURING MOST NATURAL DISASTERS, TELEPHONE AND RADIO COMMUNICATIONS ARE SUSCEPTIBLE TO OVERLOADING BY PUBLIC AND EMERGENCY SERVICES USE.

WHERE TO FIND WARNING INFORMATION (ASH CLOUD FORECAST)

The Volcano Ash Advisory Centre (VAAC) or the USGS Volcano Observatories will issue volcanic advisories and graphics forecasts on ash in the atmosphere affecting aviation.

Current Volcanic Ash Advisories – Washington VAAC <http://www.ssd.noaa.gov/VAAC/messages.html>

Current Volcanic Ash Advisories – Alaska VAAC <http://vaac.arh.noaa.gov>

Current Alerts for U.S. Volcanoes - USGS <https://volcanoes.usgs.gov/vhp/updates.html>



FEMA



Institute for
Hazard Mitigation
Planning and Research



URBAN DESIGN & PLANNING



Advice for ELECTRONICS AND COMPUTERS

How to Prepare

- > The most effective mitigation is to avoid exposure of electronic equipment to ash. This can be achieved by sealing the equipment, or the building in which it is housed
- > Ensure stocks of protective equipment such as plastic sheeting and duct tape
- > Limiting ash ingestion into buildings which house electronic equipment is also effective
- > If possible, move any outdoor electronic equipment indoors prior to an ashfall

CLEANUP

- > Avoid cleanup until ash has stopped falling. However in some cases immediate action may be required to prevent loss of function of critical equipment
- > If possible, shut down electronic equipment before cleaning to avoid possible short circuits
- > Electronic equipment can be carefully cleaned using low pressure compressed air or a soft brush
- > Avoid excessive rubbing as this may scratch delicate surfaces
- > Use a vacuum cleaner to clean rooms to avoid recontamination of cleaned area



Actions to take for ashfall. Cleaning-up inside includes vacuuming computers, office equipment, appliances, and other items.

RELEVANT TECHNIQUES FOR CLEANING FROM LABADIE (1994)

- > Clean and condition surrounding air to keep ash out of equipment.
- > Cotton mat filters used in separate clean rooms were found to be best for filtering particles, but they reduce the air flow. A solution is to use larger fans to maintain required air flow.
- > Digital integrated circuits can vary 5-10% in performance (depending on type of circuit) and still be acceptable. It is difficult to generalize about other equipment (e.g. high-voltage power supplies).
- > Humidifying ambient air (for example, wetting carpets) will help to control ash reentrainment.
- > Ash on equipment can be blown out with compressed air. If the air is too dry, static discharge could damage sensitive components (for example, integrated circuits). If the air is too damp, the ash will stick. Relative humidity of 25-30% is best for compressed air.
- > Cleaning with a pressurized water-detergent mix and a hot water rinse is quite effective. However, this process requires at least partial disassembly.
- > Ash should be blown or brushed away from power supplies.
- > Ash may have high static charge and be hard to dislodge, thus requiring brushing to dislodge particles.
- > Accelerate filter change; use pre-filters.

ADDITIONAL INFORMATION

- > <https://volcanoes.usgs.gov/ash/index.html>
- > <http://www.ssd.noaa.gov/VAAC/messages.html>
- > Primary source: https://volcanoes.usgs.gov/volcanic_ash/computers_systems.html



FEMA



Institute for
Hazard Mitigation
Planning and Research



URBAN DESIGN & PLANNING

