

# ADVICE FOR FACILITIES MANAGERS: COMPUTERS AND ELECTRONICS

VOLCANIC ASH IS: HARD, HIGHLY ABRASIVE, MILDLY CORROSIVE AND CONDUCTIVE WHEN WET.

## IMPACTS ON COMPUTERS AND ELECTRONICS

Modern electronics are well-protected from airborne contaminants, so short-term exposure to ash is unlikely to cause damage. However, functionality may be reduced.

### 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

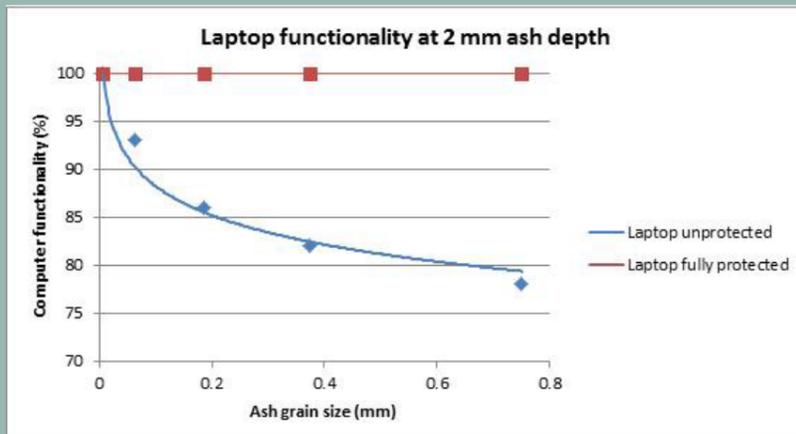
Longer-term exposure (months to years) may cause more significant damage, such as corrosion due to the reactive surface chemistry of volcanic ash.



Reducing the exposure of computer equipment to ashfall is the most effective mitigation action. Experiments suggest that laptops may shut down due to overheating when covered in ash, but relatively little enters the internal compartment. After cleaning, the laptop shown in this experiment restarted successfully.



Vacuum cleaning ash from computer keyboard.



For a 2 mm ashfall, very fine-grained ash (<0.2 mm) has less impact on computer functions than coarser-grained ash. This is because ash between 0.2-1 mm is the optimal size to block key mechanisms on keyboards, cooling fans and vents, USB ports and infrared sensors on mice.

## RECOMMENDED ACTIONS

### WHERE TO FIND WARNING INFORMATION

See [www.geonet.org.nz](http://www.geonet.org.nz) for ashfall forecasts in the event of an explosive eruption.

### 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. See companion poster: Advice for Facilities Managers: Buildings & Advice for Facilities Managers: GenSets and HVAC

- » Identify single entry/exit point into building
- » Close and seal all other doors and windows
- » Identify areas to be sealed off within building
- » Monitor cooling systems (i.e. HVAC units)



### MORE INFORMATION

THE FOLLOWING RESOURCES PROVIDE FURTHER INFORMATION ON VOLCANIC HAZARDS:

- <http://www.geonet.org.nz>
- <http://www.gns.cri.nz>
- <http://volcanoes.usgs.gov/ash/index.html>
- <http://www.ivhnn.org>

### HOW TO RESPOND

- If possible, move any outdoor electronic equipment indoors prior to an ashfall
- Set up 'ash lock' on single entry/exit point into building (see companion poster for further details)
- Seal off areas housing sensitive and/or critical electronics
- Cover non-essential equipment with plastic sheeting and shut down if necessary

### Clean-up:

- 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 areas
- Monitor HVAC systems (see companion poster). Minimise use if necessary.

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