

Advice for **POWER TRANSMISSION AND DISTRIBUTION SYSTEMS**

Volcanic ashfall can cause electricity outages and issues with power transmission and distribution systems.

Insulator Flashover

- > Insulator Flashover: Ash contamination of station and line insulators can lead to flashover.
- > Flashover may occur with <3 mm (0.12 in) of ashfall provided a significant portion of the insulator creepage distance (>50%) is covered in wet ash
- > This is the most common and widespread impact
- > Loading Damage : ash accumulation may overload lines, weak poles and light structures, and cause additional tree-fall onto lines. Precipitation will exacerbate the risk:
- > Loading damage typically occurs with >100 mm (4 in) ash accumulation " Induced tree fall from ash load may occur with thicknesses >10 mm (0.4 in)
- > Disruption to Control Systems : ash ingress into heating, ventilation and air-conditioning (HVAC) systems can block intakes leading to reduced performance, and affecting dependent systems:
- > Possible during any thickness of ashfall



220 kV transmission lines running adjacent to Tongariro Volcano, New Zealand, two days after the 6 August 2012 Te Māri crater eruption.

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>

VOLCANIC ASH FALL

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LINE BREAKAGE DUE TO ASH LOADING WAS OBSERVED FOLLOWING PREVIOUS ERUPTIONS (E.G. MT. ST. HELENS 1980, RABAU 1994 AND CHAITEN 2008). ASH ADHERENCE TO LINES IS HIGHEST DURING WET AND FREEZING CONDITIONS, ALTHOUGH THIS IS A RARELY OBSERVED IMPACT.

MANY POWER COMPANIES ARE LIABLE FOR MAINTAINING ACCEPTABLE CLEARANCE DISTANCES BETWEEN TREES AND POWER LINES ON BOTH PUBLIC AND PRIVATELY OWNED PROPERTY. PROVIDED THESE DISTANCES ARE MAINTAINED, THE POWER SYSTEM SHOULD UNDERGO NO ISSUES WITH ASH CONTAMINATION OF NEARBY VEGETATION.

HOW TO PREPARE

Cleaning ash contaminated sites and components, especially insulators, is Commonly required after an ash fall. Ensure availability of both live-line and de-energised cleanup plans which include:

- > Priority schedule for inspecting/cleaning essential sites and lines
- > Standardised ash fall clean-up procedures
- > Ready access to cleaning supplies and equipment (air compressors, water-blasters, PPT gear, vehicle air filters, etc.)

Cleaning Guidance: see IEEE Std 957 'Guide for Cleaning Insulators'.

- > Ensure all insulator surfaces are cleaned, including undersides of weathersheds
- > Insulator cleaning method will be determined by strength of ash adherence

HOW TO RESPOND

- > Initiate priority schedule for inspection and cleaning. Increased inspection and preventive maintenance may be prudent
- > A proactive communication campaign for customers/public covering your response, expected outages/ restoration times and recommended actions aids awareness and good will
- > Advise customers not to clean electrical equipment and to be careful when using hoses near electrical equipment.
- > Field crews should use safe operating procedures when operating in an 'ashy' environment. See www.ivhhn.org for guidelines for protecting people from ash hazards
- > Coordinate with local, regional and national emergency planning, as appropriate

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.html