VOLCANIC ASHFALL

Advice for

GENERATORS AND HVAC

Volcanic ashfall can cause electricity outages and issues with power supply

Common Impacts

- Use of emergency power generation equipment (Generator Sets or GenSets) may be necessary.
- Air intakes on generators are vulnerable to airborne ash and need to be protected
- Ash Ingress through air intake and condenser units may cause ash accumulation in the radiator and air filters, reducing air flow and and HVAC condenser system performance.
- Reduced airflows may cause stalling and overheating.
- High humidity significantly increases ash adhesion and thus blockage
- Filters are generally not designed to cope with the suspended particle volumes seen in volcanic ash falls, so require regular inspection and replacement
- HVAC systems with low fan speeds block more readily
- Horizontal air-intakes and condensers ingest significantly less ash than vertical systems.

Ash deposited on the engine block of a generator within the new 20MW generator farm. Deposited ash can potentially be ingested by the engine air filter which may lead to stalling.

Heating, Ventilation and Cooling (HVAC) condenser after ~32 mm of wet ash was applied over ~ 4.5 hours

WHERE TO FIND WARNING INFORMATIONC (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

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AT-RISK FACILITIES SHOULD DEVELOP OPERATIONAL PLANS FOR MANAGING ASH FALL EVENTS, INCLUDING A PRIORITY SCHEDULE AND STANDARDISED PROCEDURES FOR INSPECTING, MAINTAINING AND CLEANING.

PHYSICAL MITIGATION OPTIONS

> Install hoods over air intake to reduce direct ash ingestion

> Add temporary filtration to external air intakes, monitor and replace as needed

> Seal or cover sensitive equipment, such as external fuel valves and switches

Hood to protect air intake from ashfall for GenSet equipment in Bariloche, Argentina, following 2011-2012 eruption of Cordon Caulle volcano, Chile.

CLEANING GUIDANCE

> Vacuum or gently (30 psi or less) blow away excess ash from air intakes or condensers, then wipe down with a cloth. Air filters should be removed before cleaning

> Wet methods for ash cleanup are not recommended, as they may promote clogging of radiator fins, or cause short-circuit

HOW TO RESPOND

> Initiate priority schedule for inspection, cleaning and preventative maintenance

> Regularly check and service air and fuel intakes and filters (stock spares

> Frequency of air filter replacement could be as high as every 30 minutes during high rates of ash fall. In this case, step up preventative maintenance

> Maintain a clean site, especially in front of air intakes, to reduce remobilisation of ash

> Use dry methods where possible

> Store collected ash in bags to prevent remobilisation " Ensure stockpiled ash is well clear of equipment and air intakes

> Beware wet ash maybe conductive. Isolate and earth energised apparatus as appropriate

> Advise customers/users not to clean electrical equipment and to limit the use of water in clean up, and to be careful when cleaning near electrical equipmentCleaning with a pressurized water-detergent mix and a hot water rinse is quite effective. However, this process requires at least partial disassembly.

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/equipment_HVAC.html

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