

Operator Experiences and Impact on Operation during Volcanic Eruption

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Operator Experiences And Impact On Operation During Volcanic Eruption

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Argentina IMS Particle Monitoring Station ARP03 is located on the outskirts of San Carlos de Bariloche City near of The Andes mountain range. The Andes is a huge mountain mass that houses the highest volcanoes in the world. It occupies an area of 3,370,794 km² outlining the Pacific Ocean over 7240 km, making it the longest mountain range on Earth.

After Indonesia, our neighbor country Chile, has the second largest and most active volcanic chain on earth. Along the continental Chilean territory, there are at least two thousand volcanoes; of them, only are considered "geologically active" five hundred, sixty of which have a historical eruptive record in the last 450 years, with a total of about three hundred eruptions during that period.

Since 2008 the Argentina particle station ARP03 has been witness of the eruptions of three volcanoes that directly affect the station performance. Chaiten volcano in 2008 and 2011, Puyehue volcano in 2010 and Calbuco volcano in 2015, all three in Chilean territory nearby the station location unleashed a huge amount of volcanic ashes into the atmosphere that affected all the area of San Carlos de Bariloche and surroundings and even reached ARP01 station in Buenos Aires, 1600 km away.

CHAITEN VOLCANO (225km from the station)



PUYEHUE VOLCANO 2010 (102km from the station)



CALBUCO VOLCANO 2015 (123 Km from the station)



LESSONS LEARNED:

- Prioritize health and safety of the LO over all things
- Minimize health hazards by using personal protection equipment
- Minimize the entrance of ash inside the station facility
- Cleaning the equipment frequently to prevent damage by corrosion



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ESTACION INS BARILOCHE
ESTACION INS BARILOCHE
ESTACION INS BUENOS AIRES

When magma is ejected from the volcanic conduit, according to its viscosity, the containing gases expand, throwing pulverized rock, lava and shards of glass from the chimney. These particles are called "Pyroclasts", and those that have a similar size to sand are called "Volcanic ash".

The size of these ejected fragments ranges from a fine powder (less than 0.063 mm in diameter) and Volcanic ash sand size (less than 2 mm diameter).

IMPACT ON THE STATION

- Energy and power supply

Several power outages occurred because the ash is highly conductive, especially when wet, and generates short circuits in the transmission of electricity putting at risk equipment such as station detector, cooling system, computers, air conditioners and auxiliary generator.

- Station Equipment

Volcanic ash consists of tiny particles of rock, petrified lava and glass with a high probability of containing sulfur. It is very acidic and abrasive combination for both painting, sheet metal, glass, plastics.

- Sample Geometry

The volcanic ashes impacted directly increasing height and weight of the standard geometry sample.

- LO Safety

Due to the extreme conditions LO was instructed to prioritize his health and security over the daily operation. The volcanic ashes induce breathing sickness and the low visibility in the road that could provoke accidents.



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