# An Experimental Study on the Operation of Exterior Section of Air Conditioning Unit Suffer from Ash fall

*Hitoshi Suwa[1], Kiyotoshi Otsuka[1], Arihide Nobata[1], Tomohiro Kubo[2], Yosuke Miyagi[2], Toshikazu Tanada[2], Setsuya Nakada[2], Masamitsu Miyamura[2]

1. Obayashi Corporation, 2. National Research Institute of Earth Science and Disaster Resilience

Especially since the occurrence of phreatic eruption of Mt. Ontake in 2014, which killed 58 mountain climbers who were in the vicinity of the vent at the time of the eruption, the interests in volcanic eruptions have become rapidly increased in our country. Provided that the eruption of Mt. Fuji of the strength comparable to that of the Houei eruption (1707) should occur again, it is expected that the large amount of volcanic ash fall over the wide areas of Kanto basin where the capital city of Tokyo and the neighboring metropolitan areas exist in addition to the fall and flow depositions of pyroclasts in the proximal region to the volcano. Focusing on the influences on buildings of the ash fall, damages such as deflection and collapse of the roofs due to the loads of ash, deterioration of the efficiencies of the outdoor units of air conditioners, corrosions, shortenings of filter replacement intervals due to clogging, and so on, will be among the central matters of concern. However, sufficient knowledges to quantitatively predict the building damages caused by ash falls are lacking, so we are developing empirical parameterizations for use in damage prediction for ash fall. In this study, the exterior section of an air conditioning unit, which comprises important part of the unit in maintaining the air conditioning functions of buildings, were tested on the assumption that the unit was in the situation just after the completion of ash fall, and the performances of the exterior section were monitored and examined.

It is found from the experiments that up to the ash fall depth of about 50 mm, volcanic ash continued to adhere to the fins of the heat exchanger as the ash fall depth increases, and the slight increases of draft resistance and the fan operation current were observed. However, except for cases in which the ash fall depth was about 50 mm in the wet state, it was confirmed that the exterior section operates rather normally. We are now planning to create examples of influences on building functions depending on the ash fall depth for important facilities such as hospitals and government buildings, and to develop information tools for supporting disaster prevention personnel like local governments.

Keywords: Volcanic Ash, Business Continuity, Functional Damage, Exterior Section of Air Conditioning Unit

©2018. Japan Geoscience Union. All Right Reserved. 