

# ITO LAB.

The essentials of crisis management  
and crisis preparedness to deal  
with unexpected crises!



Department of Human and Social Systems

Crisis Management

## Effects of Ash Fall from Mt. Fuji Eruption on the Contemporary Metropolitan Area

Since the 2011 magnitude 9 off the Great East Japan earthquake, Japan is said to have entered a period of seismic activity. When a magnitude 9-class earthquake occurs, volcanic activity usually increases in the surrounding area, and in Japan, volcanic eruptions have become more active since 2011. In light of this situation, if an eruption and ash fall of the same magnitude as the eruption of Mt. Fuji that occurred approximately 300 years ago (1707) during the Hōei Era in the Edo Period were to occur today, the impact, damage, and countermeasures would be incomparably more difficult than in the Edo Period.

### Mt. Fuji Eruption in the Edo Period and its Impact on Modern Society

Mt. Fuji eruption during the Hōei Era continued intermittently for about two weeks, causing ash fall damage not only to the area around Mt. Fuji but also to the town of Edo with the final ash fall estimated to have been 3 to 10 cm. However, damage to houses, roads and water sources, no major damage occurred except some damage to crops in the fields. One of the major differences between the Edo period and modern society is the vastly different structure and character of the various types of living infrastructure. Especially transportation infrastructure such as roads, railroads, and airports; and daily life infrastructure such as electricity, communications, water, sewage, and gas; supply of food and other essential goods; and the nature of businesses, schools, and hospitals are very different between the Edo period and today. Therefore, the impact of ash fall on society is expected to be incomparably more damaging than it was then.

#### Specific Impact

Specifically, looking at the major items among these, the following are expected to occur in Tokyo and other areas where less than 30 cm of ash fall is expected, and the measures and difficulties in such cases will be discussed.

- Roads are expected to become impassable with 0.5 mm of ash fall. Therefore, transportation of goods by vehicles and movement of people will be impossible without ash removal. Ash removal will be necessary immediately after the eruption, but what is needed is to secure the personnel and the necessary heavy equipment and materials for ash removal. Even if the maximum number of personnel and the necessary heavy equipment could be secured, it would take three to five days just to remove ash from national and highway roads designated as emergency transportation routes. And it is unlikely that other roads and narrow streets will be cleared of ash. Airports will be inoperable due to ash fall on the runways in addition to the difficulty of flights.
- In the electric power industry, power outages will occur in many areas due to short circuits caused by ash fall on the insulators of power lines and distribution lines, and filters at power plants will be damaged by ash fall.
- Communication networks will be disrupted in many areas due to

power outages and clogged filters by ash fall in air conditioning facilities. Emergency power supplies are also expected to be inoperable for an extended period of time due to difficulties in transporting fuel. Waterworks will be cut off in many areas due to water pollution caused by ash falling and power outages, and sewage systems will be unable to drain water in many areas due to ash fall and power outages. Sewerage systems will also be unable to drain water due to ash fall and power outages.

- Transportation of food and other daily commodities will be halted and production at factories will be halted due to commuting difficulties, resulting in a depletion of commodities in many areas.
- Government offices, companies, schools, hospitals, etc. will be forced to suspend their activities due to commuting difficulties, power outages, communication disruptions, roadblocks, etc., and data centers and other computer-related facilities will have difficulty maintaining their functions due to the shutdown of air conditioning facilities, power outages, depletion of fuel for emergency power supplies, etc.
- Living supplies such as water and food will be in short supply for a long period of time in many areas, making it difficult to survive, let alone live, and evacuation will be necessary. Millions of people are expected to be forced to evacuate their homes, hospitals, nursing homes, and other facilities because they will not be able to maintain their daily lives. In addition to being required to evacuate on foot to certain areas. The challenge is the evacuation destination for millions of residents, including patients and residents of hospitals and facilities requiring special care, and the need to establish an acceptance system in a short period of time. Unlike in the Edo period, today the amount of ash removal is expected to be approximately 500 million cubic meters, which is more than 10 times the amount of disaster waste generated during the Great East Japan Earthquake. It will be necessary to establish temporary storage sites nationwide, select a final disposal site.

#### Conclusion

The above simulations are based on the assumption that an eruption of the same magnitude as the Hōei eruption will occur in the Tokyo metropolitan area, but a larger eruption or prolonged ash fall would have a different and more devastating impact. This is the reason why immediate consideration of countermeasures is urgently needed. As the saying goes, "If you are prepared, you are prepared," but we can only hope that we will not be "unprepared" for such a crisis.

