Reducing risks from earthquakes: earthquake alert and site-effective action in industries

*Fumiko Tajima[1]

1. University of California at Irvine

Expectations for earthquake early warning (EEW) are somewhat replacing that for earthquake prediction in the past. Alerts of strong hits can be delivered from a big network system to areas that may be affected, but only seconds before arrivals. Nonetheless, people in public may overly expect a timely accurate warning, and criticize it when the actual ground motions turn to be different from EEW. There are many algorithm developments that attempt to resolve issues related to accurate prediction of ground-motions using big network operations with a station interval of ~20 km in real-time. However, the spatial resolution covered by a big network is typically on the order of ~10 km while the variation of actual ground motions can be in a much smaller scale. Our exploratory studies have shown short wavelength variation of ground motions recorded by a dense local network (~1.5km) that also depends on the incident azimuths of seismic waves to sites. This situation evokes concerns about EEWs provided by a big network and issues of on-site monitoring systems. In high-tech industries buildings were generally built with a conventional earthquake-resistant design that meets a high standard building code and are supposed to have the strength to avoid structural collapses. In addition they are more concerned about how to protect the contents in the company buildings, expensive equipment and machines from strong ground shaking. Machines may be in operation with high speeds and/or high voltage current etc. that are vulnerable to strong shaking. It may take more than seconds to fully stop the operations after the switches are turned off with an alert. If the machines are damaged, they could leak hazardous chemicals. There are many other issues in addition to EEW to make earthquake safety in industries. I will discuss a case study of site-effective seismic safety configuration at a high-tech company.

Keywords: Earthquake Alert, Site Effective Action

