

Making railroads safer

Japan installs Vaisala equipment for strong gust detection



Dr. Kenichi Kusunoki.

The ultimate goal is to develop an automatic strong gust detection system.

The Japanese Meteorological Research Institute (MRI) has started installing new meteorological observation devices in the Shonai Plain in the Yamagata Prefecture in Japan.

MRI investigates strong gust detection systems for railroads. In the first phase, fine-scale structures of wind gust dynamics and kinematics over the Shonai Plain were explored. The major observation facilities included a network of Vaisala Weather Transmitters WXT510, two X-band Doppler radars, and an observation vessel capable of releasing Vaisala's GPS-radiosondes.

Automatic detection system in the making

MRI started the study for the system in cooperation with JR EAST (East Japan Railway Company) and other organizations. The ultimate goal is to develop an automatic strong gust detection system for railroads. The decision to warn is usually based on information from a single Doppler radar. In order to characterize and validate the gust structures, they installed 26 Vaisala Weather Transmitters at intervals of 4 kilometers in the area around the Shonai Plain.

Among the total of 26 devices, 12 were installed in Sakata City, 4 in Tsuruoka City, 6 in Shonai Town and 4 in Mikawa Town. The installation sites are railway station yards as well as municipally

owned waterworks, farms and parks. Each device is mounted on the top of a steel pole as high as 5 meters. The observation intervals are 1 second for wind direction and wind speed, and 10 seconds for temperature, humidity and pressure. The observation data is sent to the server via the Internet.

In addition to the 26 devices, an MRI portable X-band Doppler radar (X-POD: X-band Potable Doppler radar) has been installed on the roof of the Shonai Airport building in Sakata City. The radar, in combination with other devices such as the Doppler radar that was installed at the Amarume station in Shonai Town, will be used to obtain detailed meteorological data in the Shonai region. The distance between these radars is 10 km and dual-Doppler scanning is conducted. Furthermore, MRI is also planning to recognize the vertical structures of strong gust wind conditions with Vaisala GPS-radiosonde soundings. These will be launched from the observation vessel Seifu-maru, located 10 km from the shore in the study area, at 1-3 hour intervals in November 2008.

Currently, in the preliminary phase of the study, the installation of the MRI X-POD radar and the network of Vaisala Weather Transmitters have been completed. Data collection is currently under way and case studies will be reported in due course. ■

*Installing the Vaisala
Weather Transmitter
WXT510 on top of a
steel pole.*

