Measures taken since the accident on the Uetsu Line

On December 25, 2005, the limited express train Inaho No.14 derailed between Sagoshi and Kita-Amarume Stations near the No.2 Mogami-gawa Bridge. We would like to report on the measures we have taken since this accident.

Increased number of anemometers (wind meters)

To date, JR East has increased the number of anemometers at the accident site between Sagoshi and Kita-Amarume Stations. In addition, for sections with operational restrictions due to strong winds, we established multiple anemometers as our new standard and increased the number of anemometers in locations where windbreak fences were installed.
Additionally, by reconfirming the requirements for wind restrictions on sections of railway line, using information from front-line employees, topology, and wind conditions of the areas, and by adding to the sections that have operation restrictions when winds are strong, we are working to improve our safety observation network to counter these strong winds.

	As of Dec. 25th, 2005: A	As of Mar. 31st, 2009: B	Increase (B-A)
Conventional lines	228 units	674 units	+446 units
Shinkansen Lines	89 units	149 units	+60 units
Total	317 units	823 units	+506 units

Installation of windbreak fences

In order to reduce wind force on trains, we have installed windbreak fences at the following locations:

<As of Mar. 31, 2009>

	Line Name	Section	Location of Installation	Time Completed
1	Tokaido Line	Adjoining Nebukawa Station	Both sides of the line	July 1991
2	Joban Line	Between Yonomori and Ono	West side only	Feb. 1996
3	Kawagoe Line	Between Sashiogi and Minami-Furuya	North side only	Apr. 1998
4	Uetsu Main Line	Between Sagoshi and Kita-Amarume	West side only	Nov. 2006
5	Tohoku Main Line	Between Fujita and Kaida	West side only	Nov. 2006
6	Tohoku Main Line	Between Kurihashi and Koga	Both sides of the line	North side: Mar. 2007 South side: June 2007
7	Joban Line	Between Fujishiro and Sanuki	Both sides of the line	Mar. 2007
8	Keiyo Line	Between Kasai Rinkai Koen and Maihama	South side only	Mar. 2007
9	Keiyo Line	Between Ichikawa Shiohama and Futamata Shinmachi	South side only	Mar. 2007
10	Keiyo Line	Between Kaihin Makuhari and Kemigawa-hama	South side only	Mar. 2007
11	Musashino Line	Between Misato and Minami-Nagareyama	Both sides of the line	South side: Mar. 2007 Part of north side: Mar. 2009
12	Keiyo Line	Between Shiomi and Shin-Kiba	South side only	June 2007
13	Keiyo Line	Between Shin-Kiba and Kasai Rinkai Koen	South side only	Aug. 2007
14	Keiyo Line	Between Futamata Shinmachi and Minami-Funabashi	South side only	Aug. 2007
15	Musashino Line	Between Minami-Koshigaya and Yoshikawa	North side only (Both sides on bridge sections)	A part of north side: Mar. 2009

—Measures taken since the accident on the Uetsu Line—

Expanded introduction of a gale warning system

We have been adding to our gale warning system to raise the level of safety by restricting operations not only when the actual wind speed measured by anemometers exceeds restriction thresholds, but also when the projected maximum wind speed exceeds these limits.

	As of Dec. 25th, 2005: A	As of Mar. 31st 2009: B	Increase: (B-A)
Number of locations with gale warning systems	6 locations	233 locations	+227 locations

Utilizing meteorological information to test methods for operational restrictions

Local gusts are meteorological phenomena, which are said to be difficult to observe with conventional observation equipment such as anemometers. Through meteorological information obtained from Japan Meteorological Agency radar, and by detecting the passing of cold weather fronts and the accompanying development of cumulonimbus clouds, we have been investigating how to forecast the occurrence of local gusts and to apply that information to our operational restrictions. Between the periods of January and March 2008, and November 2008 and March 2009, this system was tested on the Uetsu Line between Niitsu and Sakata and on the Hakushin Line between Niigata and Shibata. In February 2009, we added sections of the Uetsu Main Line, Shinetsu Main Line, Echigo Line, Yahiko Line, and Riku-u West Line for additional testing.
During the aforementioned testing periods, though we initiated train operational restrictions three times, we did not observe any actual occurrence of local gusts.

Research on a Doppler radar observation method

We are currently investigating the possible utilization of a Doppler radar observation method to help identify local gusts, as information to be used for operational restrictions. Doppler radar can determine wind conditions by detecting the movements of raindrops and rain clouds and is used at some airports for detecting local gusts.
From July 2007, in cooperation with a special research institution, we have been furthering our procedures of meteorological observation and analysis on coastlines along the Sea of Japan during the winter season. Together with information gathered on the characteristics of local gusts, we have been testing the radar's detection capabilities against local gusts.

Doppler radar installed on the roof of Amarume Station on the Uetsu Line
Doppler radar body