



# Report on the Uetsu Line Accident and Earthquake Countermeasures

At 7:14 P.M. on December 25, 2005, the Inaho No. 14 limited express train on the Uetsu Line derailed near the No. 2 Mogamigawa Bridge between Sagoshi and Kita-Amarume, Yamagata Prefecture. This section of the annual report will report on situations related to this tragic accident as well as the progressive implementation of earthquake countermeasures in response to the Niigata Chuetsu Earthquake, a massive earthquake that struck the Niigata Chuetsu region at 5:56 P.M. on October 23, 2004, and had considerable impact on JR East facilities.

## Report on the Uetsu Line Accident

### (1) Damage Situation

—All six cars of the Inaho No. 14 limited express train on the Uetsu Line derailed near the No. 2 Mogamigawa Bridge between Sagoshi and Kita-Amarume, and three of the cars fell over to the bottom of the bridge embankment.

—This accident caused the deaths of five people and injuries to 32 others.

—Service in the area was suspended from December 25, 2005, through January 18, 2006, and resumed on January 19, 2006.

### (2) Countermeasures

To ensure that such an accident does not recur, JR East is concertedly taking the following steps to thoroughly investigate the accident and implement countermeasures.

## Current Countermeasures

|               | Countermeasure   | Description   |
|---------------|--|---|
| Accident site | Installation of additional wind gauges                         | Wind gauges installed at three sites in the affected area (on the Uetsu Line between Sagoshi and Kita-Amarume near the No. 2 Mogamigawa Bridge).  |
|               | Reduction of train speed                                       | Trains travel at 45km/h in the affected area, taking into account that weather conditions there may change rapidly. (When construction of the windbreak fence has been finished, trains will resume operation at normal speed.) |
|               | Revision of train speed limits based on wind speed             | At a wind speed of 20m/s, the train speed limit is now 25km/h, and at a wind speed of 25m/s, service will now be suspended.   |
|               | Use of weather information                                     | An early warning system based on weather information is used to manage service.   |
|               | Installation of illuminated railway safety signals             | New illuminated safety signals will be installed. Linked to wind gauges, these signals will indicate if trains should stop.   |
|               | Construction of windbreak fence                                | A windbreak fence approximately 2,300m long will be constructed along the line in the affected area between the bridge and embankment. (Scheduled for completion by November 30, 2006)  |
| Other areas   | Provisional revision of train speed limits based on wind speed | Train speed limits based on wind speed have provisionally been revised on all conventional lines. At a wind speed of 20m/s, the train speed limit is now 25km/h, and at a wind speed of 25m/s, service will now be suspended.   |
|               | Installation of additional wind gauges                         | Generally, multiple wind gauges will be installed at existing sites.  |

Notes: 1. Regarding the investigation of the causes of the accident and the fundamental countermeasures, the Uetsu Line Accident Investigation and Countermeasure Deliberation Committee will continue its deliberations for approximately one year. However, any countermeasure that can be quickly put into place will be implemented ahead of the committee's final conclusions.

2. Plans call for additional employee educational programs addressing basic policies regarding weather-related and other natural disasters as well as reviewing case studies concerning accidents that occurred in the past.

### Establishment of the Disaster Prevention Research Laboratory

Although JR East has studied disaster prevention issues for some time, primarily at its Safety Research Laboratory, the recent accident prompted JR East to establish a Disaster Prevention Research Laboratory within the Research and Development Center of the JR East Group. The new laboratory will serve as an in-house repository of scientific knowledge on adverse weather, such as the local wind conditions that have been indicated to be the cause of this accident, as well as natural phenomena in general. It will also engage in collaborative research with external experts and research organizations. In addition, the laboratory will seek to apply weather monitoring technology and a variety of other technologies from all over the world to railway operations and conduct all types of relevant and feasible R&D.

## Report on Earthquake Countermeasures

On October 23, 2004, the magnitude 6.8 Niigata Chuetsu Earthquake had considerable impact on JR East facilities, including damage to elevated railway track pillars and tunnels, deformation of rails, subsidence of bridges and elevated tracks, skewing of electric power poles, and damage to snow-melting equipment as well as the partial derailment of the Toki No. 325 Joetsu Shinkansen train.

Since that time, JR East has put lessons learned from that earthquake to good use in devising and implementing the diverse countermeasures shown in the chart, all of which are designed to lighten any damage suffered from earthquakes in the future.

## Earthquake Countermeasure Implementation

(Unit: number of elevated track pillars and bridge supports)

|   |                        | Total number | Total number to be reinforced | Number completed to date | Share (%) | Completion         |
|---|------------------------|--------------|-------------------------------|--------------------------|-----------|--------------------|
| Shinkansen lines (all areas)  | Elevated track pillars | 82,100       | 18,500                        | 17,400                   | (94%)     | End of fiscal 2008 |
|   | Bridge supports        | 11,000       | 2,240                         | 640                      | (26%)     |                    |
| Conventional lines (emergency earthquake-resistance augmentation areas) | Elevated track pillars | 42,400       | 12,600                        | 11,000                   | (87%)     | End of fiscal 2009 |
|   | Bridge supports        | 3,100        | 600                           | 40                       | (7%)      |                    |

## Earthquake Countermeasure Implementation

(Unit: locations)

| Current | Increase | Total |
|---------|----------|-------|
| 62      | 28       | 90    |