SUMMARY

The outbound 325C train, named as “Toki No.325” composed of ten vehicles, starting from Tokyo station bound for Niigata station of East Japan Railway Company, passed Urasa station on schedule, 17:49, October 23, 2004. When the head of the train passed the exit of the Takidani tunnel, 205,701m from the origin in Omiya station, at about 200 km/h in the straight track, the emergency brake had automatically operated with large jolting and the train stopped at around 207,828m from the origin in Omiya station. Among 10 vehicles of the train, 8 vehicles derailed, i.e., 12 bogies of total 20 bogies, or 22 axles of the total 40 axles were derailed, but the first axle of the front bogie of the front vehicle did not largely deviate from the track, i.e., as for the first axle of the front bogie of the front vehicle, left wheel and the gear case fastened the left rail and the right wheel and the guard iron fastened the right rail. All vehicles maintained coupled with each other. There were 151 passengers, 2 train crews and a cabin attendant were on board the train, but there was no casualty. All vehicles of the train ware damaged but there is no damage in the cabin. The 2004 Niigata Chuetsu earthquake, the maximum seismic intensity was 7, and the hypocenter was about 11 km south from the train stopped position, occurred at about 14:56 on the same day.

PROBABLE CAUSES

It is highly probable that the train derailed by the wheel raised over the height of flange and the relative lateral displacement between wheel and rail exceeded its limit due to the large earthquake ground motion, while the train ran along the track without damages which caused derailment before the train had passed.

REMARKS

In the present railway system, it is difficult to prevent train derailment completely when the train encountered the great earthquake at around its epicenter as in this accident. To prevent the train derailment such as this accident, treating as the problem for the entire railway system, introduction of some apparatus or facilities to prevent train derailment as far as possible, should be considered. In addition, to prevent the train deviate significantly and enlarge the damage even if the train derailment could not be prevented, promotion of the measures considering from the view points of both railway facilities and vehicle system are required. Here, it is necessary to promote continuously the measures such as to reinforce the withstanding an earthquake, to prevent enlargement of damage for the train running in bridge etc., when these structures were extremely damaged by the earthquake.