Railway accident investigation report

Railway operator : Kyushu Railway Company
Accident type : Train derailment
Date and time : About 21:26, April 14, 2016
Location : At around 99,160 m from the origin at Hakata station, between Kumamoto station and Kumamoto General Train Depot, Kyushu Shinkansen, Kumamoto City, Kumamoto Prefecture

SUMMARY
On April 14, 2016, the 5347A train, composed of six railway vehicles, started from Hakata station bound for Kumamoto station, Kyushu Shinkansen of Kyushu Railway Company, arrived at Kumamoto station. After that, the train departed from Kumamoto station on schedule at 21:25, in the deadhead operation. While the train was running at about 78 km/h, the driver of the train felt vertical jolts as if the earth were heaving upward, then turned off the notch and applied emergency brake operation immediately. There were large swaying shakes after the vertical jolts. After the train had stopped at around 99,461 m from the origin at Hakata station, the driver got off the train and checked underfloor condition of the vehicles, and found that all 6 vehicles were derailed.

Only the driver was onboard the train, conductors were not boarded, between Kumamoto station and Kumamoto General Train Depot, but there was no casualty. Here, the earthquake of magnitude 6.5, one of the 2016 Kumamoto Earthquakes, that the hypocenter was in depth of about 11 km in Kumamoto district, Kumamoto Prefecture, had occurred at about 21:26, April 14, 2016. The maximum seismic intensity 7 was observed in Mashiki Town, Kumamoto Prefecture.

PROBABLE CAUSES
It is probable that the accident occurred as the train was derailed due to being acted by the ground motion of the earthquake occurred on about 21:26, April 14, 2016, which was one of the 2016 Kumamoto Earthquakes.

As for the process to the derailment, it is probable that many axles were derailed almost the same timing, because each vehicle in the train rolled significantly and wheel flanges of left or right wheels climbed up the rail, due to the amplified rolling motion in the frequency range to promote rolling of vehicles acted in the structures, in addition to the violent shakes in lateral direction to the track acted on just under the structure around the accident site, caused by the amplified ground motion.