

## Railway accident investigation report

Railway operator : Nagasaki Electric Tramway Co. Ltd.

Accident type : Vehicle derailment

Date and time : About 22:50, June 2, 2016

Location : At around 923 m from the origin at Nagasaki Eki-Mae tram stop, between Suwajinja-Mae tram stop and Kokaido-Mae tram stop, double track, Sakuramachi Branch Line, Nagasaki City, Nagasaki Prefecture

### SUMMARY

On June 2, 2016, the 362 vehicle, composed of one railway vehicle, started from Hotarujaya tram stop bound for Akasako tram stop of Nagasaki Electric Tramway Co. Ltd., departed from Suwajinja-Mae tram stop on schedule at 22:47.30. While the vehicle was passing the right curved branch line for Nagasaki Eki-Mae tram stop, in the turnout at Kokaido-Mae intersection, the driver of the vehicle felt abnormal situation as if the vehicle was heaved up accompanied with abnormal sound, then the driver applied an emergency brake and stopped the vehicle. The driver got off the vehicle to check the situation, and found that all two axles in the rear bogie were derailed to left of rail.

There were a passenger and the driver onboard the vehicle, but there was no casualty. The accident site was in the intersection of the road together with tramway, but the derailed vehicle did not contact nor collide with automobiles, etc., before and after the derailment.

### PROBABLE CAUSES

It is probable that the accident had occurred as the vehicle running right curve in the turnout in the intersection, as the backside of right wheel of the first axle of the rear bogie had been contacting with the side surface of the portion which had the function of guard rail in the diamond crossing, the back side of right wheel climbed up around the tip of the nose rail and started derailment, and after the wheel flange ran on the upper part of the side surface of the portion, the left wheel of the axle ran onto the left rail and the axle derailed to left, then followed the derailments of the second axle in the rear bogie to left.

It is probable that the right wheel of the first axle in the rear bogie ran onto the rail and derailed caused by the effects of increased lateral force acting on backside of the wheel due to the abrupt contact of the wheel and the deformed tip of the nose rail, and decreased contact angle between backside of the wheel and the deformed tip of the nose rail.

It is probable that the tip of nose rail was deformed by the repeating shocks by backside of right wheels of the front axle of bogies of plural vehicles, acting on the tip of the nose rail in the state of being easily deformed, caused by the effects of the lowered height of the tip of the nose rail by the design modification, in the diamond crossing existed in very small radius curve where wheels always contact with tip of the nose rail structurally.