

"The accident that freight wagon derailed due to be acted by excessively large compressive coupler force when the freight train was operated in the pushing operation by locomotive in the premises of the station"

Railway operator : Japan Freight Railway Company  
 Accident type : Train derailment  
 Date and time : About 10:05, July 24, 2021  
 Location : In the premises of Sumidagawa station, Joban Line, Arakawa-ku, Tokyo

<SUMMARY>

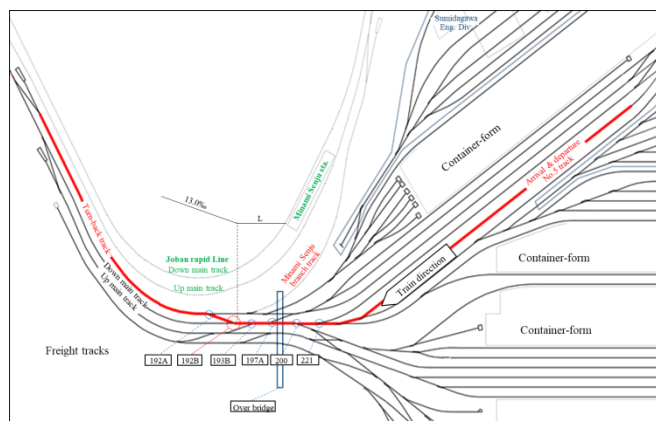
On July 24, 2021, the 72 train, composed of 20 vehicles started from Sumidagawa station bound for Tokyo Freight Terminal station, of Japan Freight Railway Company, departed from the arrival and departure No.5 track of Sumidagawa station on schedule, at 10:03. While the driver of the train was operating in the powering operation at the velocity of about 18 km/h in the pushing operation by locomotive toward the turn back track in the premises of the station, noticed a cloud of dust rising at around the freight wagon in ahead to the direction of travelling, therefore, applied the emergency brake immediately. Here, the words, left, right, front, rear, were based on the running direction of the train.

After the train stopped, the driver detrained and checked the situation, and found that all two axles of the front bogie of the third vehicle had been derailed. Here, vehicles are counted from the locomotive.

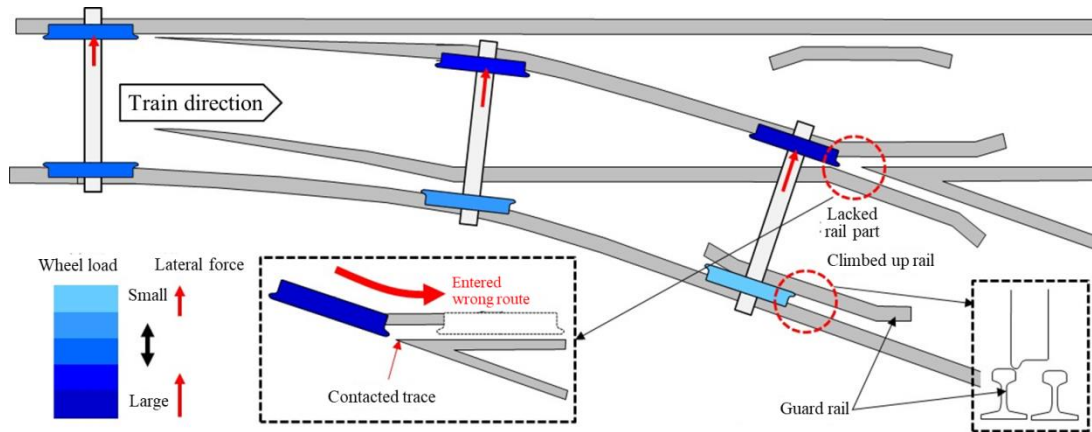
The driver was boarded on the train, but the driver was not injured.



Status of the site and periphery



Operating status of the train



Status of the derailment

### <PROBABLE CAUSES>

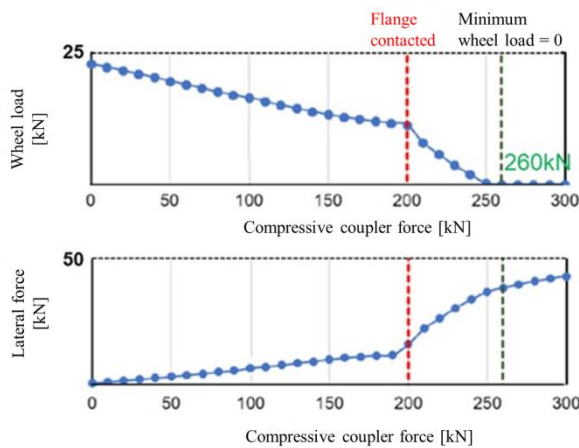
It is probable that the train, coupled with 19 freight wagons, derailed while running by the pushing operation by locomotive, in the concerned accident, because right wheel of the front axle of the front bogie of the third freight wagon climbed up the branch line side guard rail at the crossing part of the turnout, after that left wheel entered the wrong track side.

It is probable that right wheel climbed up the branch line side guard rail at the crossing part of the turnout, because back side of right wheel of the freight wagon had climbed up the branch line side guard rail at the lacked rail place in the crossing part, due to the increase of lateral force of the front axle of the front bogie and the decrease of wheel load of right wheel of the same axle, caused by the excessively compressive coupler force generated in the status that the coupler swaying angle of the freight wagon had been enlarged due to the horizontal displacement of the vehicle body while the empty loaded freight wagon was running in around the turnout.

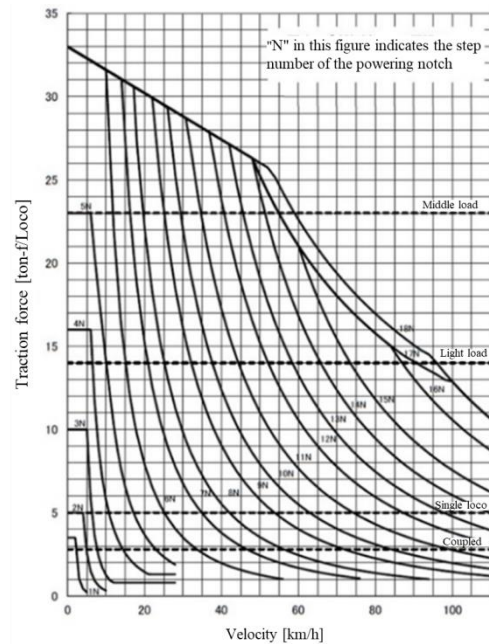
It is probable that the excessive compressive coupler force had been generated because the operation of the main handle of the master controller had not been implemented obeyed to the prescribed operation, related with that the setting of the weight selecting switch before started the pushing operation by locomotive was not in the prescribed position, and that the driver had been understood that the rule of handling operation in the pushing operation by locomotive did not applied to the concerned train, and the driver's consciousness had been concentrated to velocity and stopping position, although the velocity had not exceeded the limited velocity, just before when the front bogie of the third freight wagon was running in around the crossing part of the 192B turnout.

It is likely that the education to understand the contents of the works in the pushing operation by locomotive correctly had been insufficient, related with that there was the difference between the recognitions for the concerned rule in the head office, the branch office and the engine division of the JR Freight, as the background of that the driver had been understood that the rule of handling operation in the pushing operation by locomotive

was not applied to the concerned train.



Analyzed results of the relation of wheel load and compressive coupler force vs. compressive force



Traction force vs. velocity characteristics of the locomotive of the accident train

#### <MATTERS EXPECTED TO PREVENT RECURRENCE>

It is necessary for the JR Freight to implement the education again and guide to obey the rules in order to let the driver understand correctly the operation of the main handle of the master controller and the handling method of the load weight selection switch in the pushing operation by locomotive prescribed in the working standard, etc., as the measure no to generate the excessively compressive coupler force. Furthermore, it is expected for the JR Freight to study on the improvement as to enlarge the radius of curvature in the lead part of the turnout considering the track layout in the place where turnout was installed and surroundings, because the compressive coupler force, to make wheel load as zero, can be made larger and improve safety against derailment in the pushing operation by locomotive, by enlarged the radius of curvature of the lead part of the turnout and by reduced the swaying angle of the couplers when passing through the turnout.

Details can be obtained by the railway accident investigation report in the home page of the Japan Transport Safety Board, i.e., <http://www.mlit.go.jp/jtsb>