

Information note on the progress of the survey
On-line derailment of SNCF freight train on the Paris to Lyon line
at Sens / Saint-Julien-du-Sault (Yonne)
18 August 2020

Warning:

*The BEA-TT technical investigation is not yet complete.
The following progress note is part of a process aimed at informing about the progress of the technical investigation and announcing the first preventive orientations to the entities concerned as soon as possible.
It is based on elements that are still partial.*

The circumstances of the accident

The conventional line from Paris to Lyon consists of a 4-track platform north of Saint-Julien-du-Sault. On 19 August 2020, SNCF freight train, weighing 1,800 tonnes, was travelling on track 1bis when one of its wagons derailed at Sens. The train was to connect Dourges (near Lille) to Vénissieux. Authorised to travel at 120 km/h and with electric traction, it was made up of 31 container wagons, some of which were carrying dangerous materials, and was 637 m long.

The derailment was caused by a broken bearing box on the first axle of the 29^e wagon, a swap body carrier loaded with two portable tanks.

The track had to be completely replaced from Pk 123.450 to Pk 131.950.



Derailed wagon and track in situation

Course of events:

The train left Dourges at 19:49. It ran normally until it reached the "hot box detector" (HBD) at Liancourt, where a rise in the temperature of an axle box, without triggering an alarm, was noted *afterwards*.

On the rest of its journey upstream of the point of derailment, the train was subject to two hot box detection notices, at Bobigny and Moret stations. These resulted in the train being stopped on the line and the driver inspecting the wagons. After each of these stops, the train set off again: first stop at 1 h 47, departure at 2 h 52, second stop at 3 h 27, departure at 4 h 17.

At Pk 123.6, the driver of a cruiser train observed sparks in the last third of the train. He immediately reported this fact to the line regulator by GSM-R radio link. Following a leak in the train's brake pipe, the driver initiated emergency braking and then activated the radio warning signal and the light warning signal. The train stopped 6 km further on at 5.05 a.m. at Pk 132.4.

The derailed wagon is located at Pk 131.8. The axle box of the derailed wagon was found at Pk 123.6. The first traces of derailment appear on the left-hand side of the track from Pk 123.5. The second axle of the bogie would have derailed later, when it met a pedestrian crossing at Pk 130.4.

The wagons immediately adjacent to the affected wagon did not derail. The following wagon shows visible damage from ballast spraying. The wheel treads are impacted by the ballast. The preceding wagon was damaged by the combination of buffers with the following wagon.

First elements

The analysis of the facts shows that two fields of investigation should be distinguished for the analysis of the causes of this derailment:

- organizational and human to reveal why the safety management system defined to manage the occurrence of a hot box did not work properly;
- technical to explain the causes of the appearance of a hot box on this type of rail motorway wagon and the mechanisms of its advanced degradation following the continuation of the journey.

Organisational and human aspects

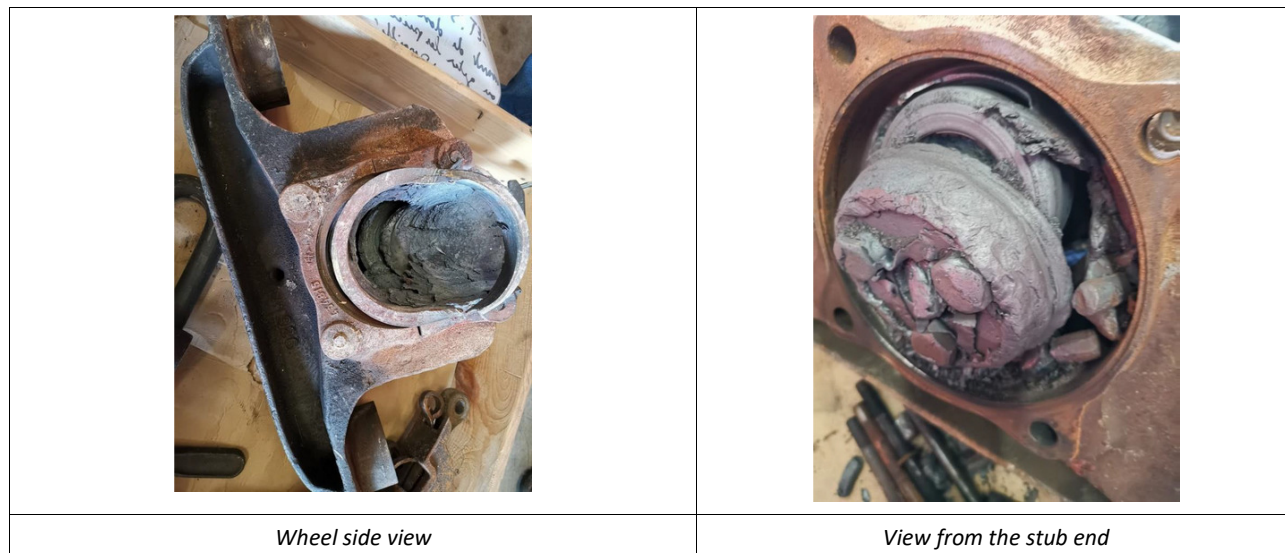
The train was subject to several hot box detections without on-site confirmation when the train stopped on the axle in question. The first took place after 214 km at the Bobigny HABD, the second at the Bois-le-Roi HABD.

In both cases, the driver had to carry out the inspection of his long train at night, in pouring rain and without special tools. In the action, the exchange of information between the driver and the traffic officers concerned was not always properly formalised.

Technical aspects

The axle box of the wagon (29^e mentioned above), first and right-hand side in the direction of travel, heated up until the axle journal melted. The derailment of the first axle seems to have occurred when this stub axle broke and the axle box was ejected.

The nature of the deformations, illustrated in the following figures, shows that the axle box would have melted and flowed with metal, resulting in a stub axle failure and derailment.



The expert assessments carried out

The BEA-TT investigators had access to the documents of the judicial expertise in progress. They went to the scene of the accident and interviewed the driver of the accident train, as well as the representative of SNCF Réseau and the owner of the wagons. They examined the premises and the railway equipment concerned (chassis, bogie, axles). The data recordings relating to the running of the train were analysed.

The direct cause and factors identified at this stage

At this stage, the cause of the derailment is the failure of regulatory procedures to deal with a "hot box".

Pending the results of the laboratory tests carried out as part of the legal proceedings, the cause of the overheating of the axlebox has not yet been established.

The investigation report will be drawn up at the end of these assessments and will propose safety recommendations to prevent this type of accident.

/// end of note ///