Seized axle and crew fatigue led to November 2014 CN train derailment near Kwinitsa, British Columbia

RICHMOND, BC, July 19, 2016 /CNW/ - In its investigation report (R14V0215) (http://www.tsb.gc.ca/eng/rapports-reports/rail/2014/r14v0215/r14cv0215.asp) released today, the Transportation Safety Board of Canada (TSB) determined that a seized and locked axle, crew fatigue, and misinterpretation of a fault indicator led to the derailment of a Canadian National Railway (CN) train near Kwinitsa, British Columbia. There were no injuries and no dangerous goods were involved.

On 15 November 2014, a westbound CN train, consisting of 2 locomotives and 153 loaded intermodal flat cars, stopped in a siding to let an oncoming train go by. After exiting the siding, the train seemed to take slightly longer than expected to accelerate. About 12.5 miles west of the siding near Kwinitsa, a surge was felt as the train passed through a switch, and soon after that a train-initiated emergency brake application occurred. After coming to a stop, performing the emergency radio call, and inspecting the train, the crew found that the No. 4 axle of the trailing locomotive was locked and had derailed along with 8 intermodal flat cars consisting of 17 platforms.

The investigation determined that the No. 4 axle of the trailing locomotive had locked when overheating parts on the traction motor assembly cooled down and seized together while the train was stopped in the siding. Extensive wear and heat generation had been occurring within the traction motor assembly due to an undersized traction motor shaft. The locked axle prevented the wheels from rotating and caused the wheels to slide along the rail, become deformed, and then derail as the No. 4 axle passed through the switch near Kwinitsa.

The investigation also found that an intermittent wheel slip indicator had activated when the train resumed its movement and left the siding. These indications are not uncommon when locomotives are pulling with high tractive effort, as they do when accelerating from a stop, and the crew was not concerned by its activation.

The train had passed several wayside inspection systems prior to the derailment without triggering any alarms, including one between the siding and the derailment site. That system however, inspected only 9 axles—even though the train had 424 axles—because the damaged wheel set then dislodged the heat sensors on the inspection system. The scan results for those 9 axles were announced about 30 seconds later. However, the crew did not notice that the announcement had been transmitted much earlier than normal.

The crew members were fatigued at the time of the occurrence, because in the preceding days they had erratic sleep patterns due to work shifts with variable start and end times. Such work/sleep patterns cause circadian rhythm disruptions, which can decrease performance and cognitive function. If shift start times are highly variable, train crew members may not be able to get good quality sleep on a regular basis, increasing the risk of accidents due to fatigue.

Following the occurrence, CN reformatted its wayside inspection systems to include axle counts as part of the post-scan announcement.

See the investigation page (http://www.tsb.gc.ca/eng/enquetes-investigations/rail/2014/r14v0215/r14v0215.asp) for more information.

The TSB is an independent agency that investigates marine, pipeline, railway and aviation transportation occurrences. Its sole aim is the advancement of transportation safety. It is not the function of the Board to assign fault or determine civil or criminal liability.

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