

tendency for the brake to leak more under the greater pressure. The three wagon-brakes and one van-brake would have a slight retarding effect. The only safe thing was to put on all the hand-brakes. The only safe way to leave a train on an incline with the engine disconnected is to apply all the hand-brakes as well as the Westinghouse. The vital part is the taking-away of the pump. A first-class fireman or second-class engine-driver has no knowledge at all of the coefficients of friction, &c. Applying common-sense, it is knowledge. You cannot tell what leakage goes on. These men have only ordinary experience of Westinghouse brakes. After uncoupling, train remained motionless. The brake must have held originally. A cock closed in the front part of train would account for accident. It is reasonable that guard would control couplings. The guard may have examined couplings after shunting. A competent guard would make his coupling-examination before his final brake-test. Under ordinary circumstances the action of the guard in depending upon the action of the brake in the rear van would be sufficient for him to think it was acting right through. If guard gave signals I should be justified in believing that driver would think that brake was in working-order. There would be no reason for driver to think that brake was not working at time of uncoupling. He would have no means of knowing that a cock was closed at rear of train. He would, two or three carriages from engine. He may not notice it unless he was paying strict attention. My company carry two sprags. Two sprags alone would not have held that train on that grade. I should say that it would want a sprag to about half the carriages. I think if he had put on the hand-brakes it would have been quite sufficient. If the brake was in moderately good order it would have held on much more than five or six minutes. I should say that it would not be possible for train to run away if Westinghouse brakes applied. It is quite possible that brake had been tampered with or closed. It would take a very short time to put on hand-brakes.

*Prendergast:* Detaching engine in that position was hazardous, and under circumstances every precaution should have been taken. Assuming that the full reduction was made on Westinghouse brake on train I consider that the brake approximately must have been operative on about one-third of train to have held it for about five minutes.

*Court:* Having regard to circumstances of this accident, it is my opinion that if existing rules are not already clear on the point—and I think they are—they should be made quite clear as to the right of engine-drivers to uncouple their engines from trains on grades without first warning and conferring with the guard in charge of train as to what steps should be taken before uncoupling engine to secure the safety of train.

J. MARCHBANKS.

Taken and sworn at Auckland, this 2nd day of September, 1907, before me—CHAS. C. KETTLE, D.J.

This deponent, ALFRED LUTHER BEATTIE, being recalled and sworn, saith:—

I am Chief Mechanical Engineer of Government Railways of New Zealand. The train to which accident happened was fully equipped throughout with Westinghouse brakes. The brake apparatus was fitted to the two engines and each vehicle. The usual practice on British railways is not to fit all of the goods stock but only the passenger-stock. I mention that as showing that the equipment of the New Zealand railways as regards the Westinghouse brake is up to date. The Westinghouse brake was introduced on the Wellington—Napier—New Plymouth Section in 1901. On the Auckland Section partially in 1901 and generally early in 1903. On the Hurunui—Bluff Section partially in 1902, generally in 1905. Since its introduction on New Zealand railways the Westinghouse brake has proved to be an efficient and satisfactory brake in all respects. So far as I am aware it has never failed to stop a train when required, provided, of course, that it has been properly handled and properly connected. Return produced compiled from official records. (Exhibit No. 35.) The only case that has been reported of the Westinghouse brake failing to stop a train when required occurred at Tariki Road Station in Taranaki district. In that instance the train overran the platform, because a cock in train-pipe was closed between third and fourth vehicles from engine. It was a mixed train. Train consisted of about twelve carriages and a van. It was ordinary express. The cock which was closed was at north end of fourth car from front. It was closed during shunting operations and not reopened. There was no accident; simply overran station. Since the introduction of Westinghouse brake we have run trains equipped with that brake approximately 23,000,000 train-miles, and the only failure reported was case mentioned. We keep our brake returns in same form as Board of Trade returns. Return put in (Exhibit No. 36) compiled from Board of Trade blue-books, covering a period of five years, during which time trains on British railways ran upwards of 323,000,000 train-miles, and during those five years under the heading of "Failure or Partial Failure to act when required in Case of Accident to a Train or a Collision between Trains being imminent" there were no failures. Under the heading of "Failure or Partial Failure to act under Ordinary Circumstances to stop a Train when required" there were sixteen failures in five years, or an average of one failure in upwards of 20,000,000 train-miles. Those failures were due to following causes: viz., failure of air-pump, 7; cocks not opened, 7; failure due to connection on engine with other brake, 1; failure for which no cause is given, 1. The Westinghouse brake so far as I know is kept in thoroughly good working-order on New Zealand railways. There is no stint of men or material. The desire of the Department is to keep the Westinghouse-brake apparatus in best possible condition. I am quite satisfied that the Westinghouse brake is the best brake we could have for New Zealand railways, one of the strong points being that it operates on every vehicle to which it is applied at same moment, its action being automatic. I might also mention that by reason of the Department having so comparatively recently adopted a continuous train-brake the New Zealand railways have been fortunate in obtaining the latest and most efficient pattern. The Westinghouse brake on a 1-in-36 grade, on a train of 226 tons, would have been amply powerful to hold that train for a certain length of time assuming that the brake was connected and in operation throughout that train. Any reduc-