INTERSTATE COMMERCE COMMISSION

WASHINGTON

REPORT NO. 3744

THE WASHINGTON TERMINAL COMPANY

IN RE ACCIDENT

AT WASHINGTON, D. C.

OCTOBER 20, 1956

SUMMARY

Date:	October 20, 1956
Railroad:	Washington Terminal
Location:	Washington, D. C.
Kind of accident:	Train striking bumping post
Train involved:	Passenger
Train number:	173
Consist:	Locomotive units 1905 and 6551
Speed:	3 to 4 m. p. h.
Track:	Tangent; 0.47 percent ascending westward
Time:	1:44 p. m.
Casualties:	11 injured
Cause:	Failure to stop train short of bumping post as a result of inoperative sanding devices

INTERSTATE COMMERCE COMMISSION

REPORT NO. 3744

IN THE MATTER OF MAKING ACCIDENT INVESTIGATION
REPORTS UNDER THE LOCOMOTIVE INSPECTION ACT
OF FEBRUARY 17, 1911, AS AMENDED

THE WASHINGTON TERMINAL COMPANY

May 27, 1957

Accident (train striking bumping post) at Union Station, Washington, D. C., on October 20, 1956, caused by failure to stop train short of bumping post as a result of inoperative sanding devices.

REPORT OF THE COMMISSION[1]

TUGGLE, Commissioner:

On October 20, 1956, a Baltimore and Ohio train consisting of two locomotive units struck the bumping post at the end of a station track at Union Station, Washington, D. C. Nine passengers and two train-service employees were injured.

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[1] Under authority of section 17 (2) of the Interstate Commerce Act the above-entitled proceeding was referred by the Commission to Commissioner Tuggle for consideration and disposition.

DESCRIPTION OF ACCIDENT

Baltimore and Ohio train No. 173, a first-class west-bound passenger train consisting of locomotive units 1905 and 6551, coupled in multiple control in the order named, departed from Mt. Royal Station, Baltimore, Md., at 12:50 p. m., on time. This train entered Station Track No. 7 at Union Station, Washington, D. C., and while moving at an estimated speed of 3 to 4 miles per hour it struck the bumping post at the end of the track.

The weather was cloudy at the time of the accident, which occurred about 1:44 p. m.

The fireman was operating the train from the leading end of locomotive 1905, and the engineer was standing beside the fireman when the accident occurred.

In the immediate vicinity of the point of accident the track is tangent. The grade is 0.47 percent ascending approaching the bumping post.

No equipment was derailed. The steel pilot of locomotive 1905 was badly damaged.

Nine passengers, the conductor, and the brakeman were injured. Three passengers and the two employees were taken to a hospital for examination and treatment, and two passengers were given medical treatment by a nurse at the station. The other four passengers refused medical treatment.

DESCRIPTION OF LOCOMOTIVE AND APPURTENANCES

Locomotive units 1905 and 6551, designated as RDC units, were built by the Budd Company in September 1953. Locomotive unit 1905, a self-propelled passenger type unit, weighs, in working order, 118,540 pounds, and the weight on the driving wheels is 60,740 pounds. Locomotive unit 6551, renumbered 1951 since the accident occurred, is a self-propelled passenger-baggage type unit, and weighs, in working order, 118,640 pounds. The weight on the driving wheels is 60,810 pounds. Each unit is 85 feet long between couplers and is mounted on two four-wheel trucks. The specified diameter of the driving wheels is 33 inches when new. The wheel base of each truck is 8 feet 6 inches. The distance between the center-lines of the trucks of each unit is 59 feet 6 inches. Power for each unit is supplied by two 275-horsepower, 2-cycle, model 61801-RA Diesel engines manufactured by General Motors Corporation, mounted under the floor of the unit. Each engine drives the inboard axle of one truck through a torque-converter transmission, a reversing-gear box, a shaft, and an axle-mounted gear box. An operating station is located at the right-

hand side of the vestibule at each end of the units.

Each unit is equipped with HSC air-brake equipment, a 3-YC air compressor, Budd Disc brakes, and an M-23 brake valve with a safety-control feature and a Weston model 545 R.D. speed indicator at each operating station. A Rolokron anti-wheel slide device is provided for each pair of wheels. The Rolokron is an inertia device connected to the axle in such manner that, after a brake application, an excessive rate of deceleration of the axle closes electrical contacts which energizes a solenoid. The solenoid operates a valve which shuts off the air supply to the brake cylinders of the truck in which the axle is located and releases the air from these brake cylinders, thereby permitting the wheels to resume normal rotation. After a predetermined time, controlled by a time relay, the circuit is opened and the solenoid deenergized. The valve then operates to permit brake-cylinder pressure to be restored and braking resumed. In normal operation, sand is deposited automatically on the rails ahead of the front wheels of both trucks when a Rolokron functions on a unit. Sand is also deposited automatically on the rails ahead of the front wheels of the trucks of both units when the brakes are applied in emergency. Manual sanding is provided and is controlled by a push button at each operating station.

Each unit is equipped with sanding equipment consisting of the control system, and a sand box, an HS-92 sand trap, and a delivery-pipe line for each wheel of the unit. The sanding system is designed to provide directional sanding. All the sand boxes, except two located in the baggage compartment of unit 6551, are located between the inner and outer side sheets of the car and are secured by spot welding. Each of these sand boxes is provided with double exterior filling doors in a metal frame. The frame consists of channel iron extending across the top and along the sides of the filling opening in the sand box, and it is secured to the sand box by spot welding. At the time the accident occurred, the joint between the frame and the side of the sand box was sealed by a soft caulking compound. The joint between the frame and door assembly is sealed by sponge rubber. The HS-92 sand trap assembly includes a pipe bracket which is mounted beneath the sand box. The sand trap is bolted to the pipe bracket. The joints between the sand box and the pipe bracket, and between the pipe bracket and the sand trap are sealed by gaskets. Air from the sanding reservoir is supplied to the sand trap through a 1/4-inch pipe connected to the pipe bracket. Air entering the sand trap from the pipe bracket flows through a port and then through a brass strainer. A clean-out and inspection cover is provided on the side of the sand-trap body.

EXAMINATION OF PARTS INVOLVED

The brakes of the train were tested and were found to function as intended. The air compressors were tested for capacity by orifice test and they maintained the proper capacity. The Rolokron system was tested by actuating each Rolokron manually and the system functioned as intended. Brake-shoe thickness varied from 9/16-inch to 1 inch.

The sanding equipment for supplying sand to the right and left Nos. 1 and 3 wheels of unit 1905 and to the right and left Nos. 4 and 2 wheels of unit 6551, which were the leading wheels of the trucks in the direction of movement of the train, were tested by operating the manual push button, by placing the brake valve in emergency position, and by operating the Rolokrons manually. It was found that only the right and left No. 3 sanders of unit 1905 were functioning. The amount of sand deposited on the rail by these sanders when tested by the three methods varied from practically no sand to two pounds of sand per minute.

Examination of the sanding equipment that failed to function disclosed that water was entering the sand boxes at the joints between the door frames and the sand boxes. The air strainers in all traps involved except the left No. 1 trap of unit 1905, were obstructed by corrosion. Wet sand was found either in the sand boxes or traps of all the sanding equipment involved except at the left No. 4 location on unit 6551. The port leading to the air strainer of the right No. 1 sand trap of unit 1905 was obstructed by a piece of rubber and wet sand.

INSPECTION AND REPAIR REPORTS

Unit 1905 received last annual and monthly inspections on July 14, 1956 and October 2, 1956, respectively.

Unit 6551 received last annual and monthly inspections on April 21, 1956 and October 6, 1956, respectively.

Inspection reports on file at Riverside Enginehouse, Baltimore, Md., where the units are regularly inspected and repaired, were examined for the 30-day period immediately prior to the accident and no items were reported which had any bearing on the accident.

SUMMARY OF EVIDENCE

The fireman was operating the train under the supervision of the engineer. The train was stopped several times en route from Baltimore to Washington. The engineer said he thought that

the rate of deceleration was less than usual when the train was stopped at Laurel, Md., and at Ivy City Enginehouse, Washington, D. C., 17.4 miles and about 1.8 miles east of the point of accident, respectively. The fireman had made a service application of the brakes and the speed of the train was about 10 miles per hour when the train entered Station Track No. 7. After the train entered the track the fireman made a further brake-pipe reduction. The train decelerated rapidly. The fireman then moved the throttle from No. 1 position to No. 2 position and partially released the brakes when the train was about 500 feet from the bumping post to prevent the train from stopping short of the customary stopping point. Immediately afterward both the engineer and the fireman observed that the north rail near the bumping post was wet and discolored. The fireman made a further service brake application, moved the throttle back to No. 1 position, and operated the manual sanding button. The engineer and fireman said that the brake application was ineffective. The speed of the train at that time was 3 to 4 miles per hour. The fireman made an emergency brake application when the train was about 15 feet from the bumping post but the speed of the train was not materially reduced before the accident occurred.

The engineer said he observed that the brake-cylinder pressure as shown on the brake-cylinder pressure gauge decreased, indicating that a Rolokron had functioned on the front truck of unit 1905. He was not certain whether the Rolokron functioned before or after the emergency application of the brakes. The conductor said that when the train was about 20 to 30 feet east of the bumping post he heard brakes release and that the sound of the exhaust of air indicated that a Rolokron had functioned. An off-duty employee who was in the second unit of the train said that he heard brakes release before the brakes were applied in emergency.

Examination of the track after the accident occurred disclosed that the north rail was covered with a film of grease throughout a distance of approximately 70 feet east of the bumping post.

DISCUSSION

In order to prevent the sliding of a pair of wheels when a brake application is made, the Rolokron associated with the pair of wheels functions when wheel-rail adhesion drops to a point at which the wheels begin to slip. Since the air-brake systems of RDC units are designed to produce maximum braking effort consistent with wheel-rail adhesion, the high level of wheel-rail adhesion obtained under favorable rail conditions is necessary to prevent the functioning of the Rolokrons when a heavy brake application is made. It has been observed in the operation of these units under unfavorable rail conditions that if the sanding devices fail to deliver sand when required, or fail to deliver sufficient sand,

stopping distance of the units may be increased because of repeated functioning of Rolokrons. When brake-cylinder pressure is restored after a Rolokron functions, it is probable that the Rolokron will again function unless wheel-rail adhesion is increased by the application of sand to the rails or rail conditions improve, provided brake-cylinder pressure is not reduced by manipulation of the brake valve.

It is evident that rail conditions in the vicinity of the bumping post were such that with a heavy brake application the use of sand would be necessary to prevent Rolokrons from functioning as this train was approaching the point where it was required to stop. Apparently, because of the failure of the sanding devices, Rolokrons functioned and increased the stopping distance to the extent that the train struck the bumping post.

CAUSE OF ACCIDENT

It is found that this accident was caused by failure to stop train short of bumping post as a result of inoperative sanding devices.

Dated at Washington, D. C., this 27th day of May 1957

By the Commission, Commissioner Tuggle.

(SEAL)

HAROLD D. McCOY,

Secretary