Lock Bypass Causes 2 Accidents

"These accidents were caused by the improper operation of an interlocking lever and the resulting movement of a power-operated switch under trains, made possible by the improper application of an emergency release device of the interlocking."—ICC Report.

● The following is an abstract of Report No. 3861 of the Interstate Commerce Commission of two accidents on the Illinois Central at Kensington, Ill., on June 25 and October 21, 1959.

These accidents occurred within interlocking limits at Kensington, about 14 miles south of Randolph St. Station in Chicago, at switch No. 107. Tracks 1 and 2 of the six-track line, and tracks 1, 2, 3 and 4 of the eight-track line are provided with a catenary system for the electrically propelled multiple-unit trains.

The interlocking at Kensington is of the electric type and is controlled from two interlocking machines in the interlocking tower. Time and approach, route, indication and mechanical locking are provided. An established route over switch 107 cannot be changed when the track circuit of switch No. 107 is occupied, unless an emergency release device associated with the interlocking machine is used.

The emergency release device is enclosed in a cabinet, whose door may be locked and sealed in the closed position. This emergency release consists of rotary switch with contacts numbered to correspond with the switches. When the contact arm is in the normal position, the electric locking circuits of all switches controlled from the interlocking machine are effective. When the contact arm is moved to a position corresponding to a particular switch, the electric locking of that switch is released. After operating the emergency release device, the switch involved may be operated from the interlocking machine, regardless of track occupancy, provided that the lever which controls the signal governing movements over the route is in the normal position. A time release, set for 15 seconds, is associated with this emergency release device.

The carrier's instructions prescribe that after the switch has been operated to the desired position, the contact arm of the release must be returned to normal, and the cabinet door closed and sealed. The device was so installed that the cabinet door could be closed and sealed while the contact arm was in other than the normal position.

Accident of June 25, 1959

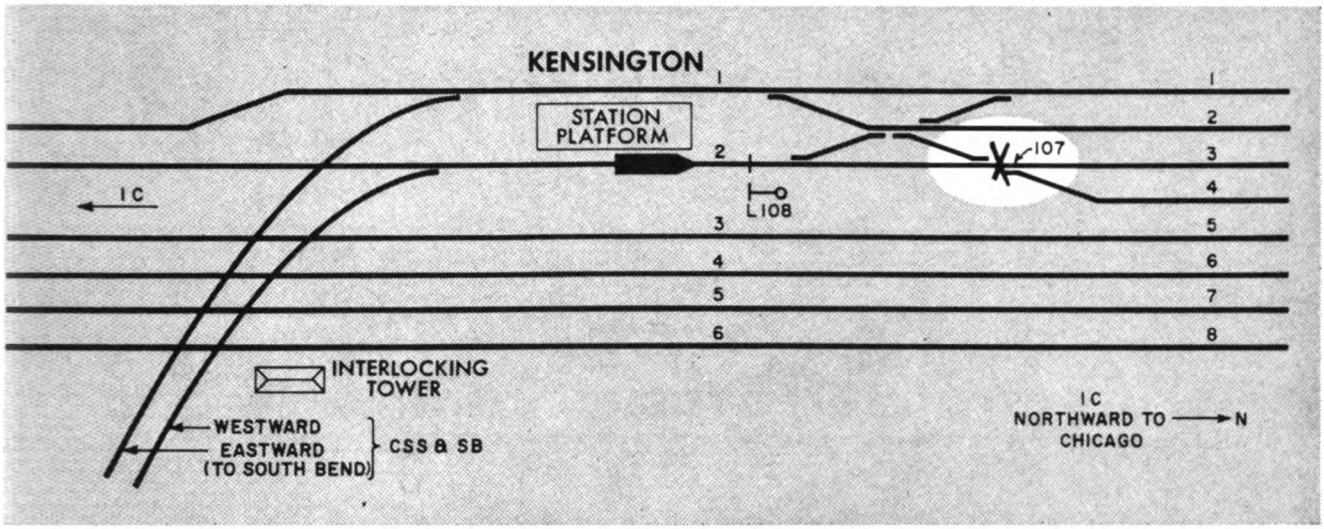
IC train No. 290 moved northward on track No. 2 and stopped at the station at 10:19 p.m. At this time a westbound CSS&SB train stopped at a point south of the interlocking and waited for No. 290 to depart from the station. It was the intent of the interlocking operator to route No. 290 from Track 2 of the six-track line to track No. 3 of the eight-track line, and then route the northbound CSS&SB train from track No. 2 of the six-track line to track No. 4 of the eight-track line.

Before No. 290 departed from the station, the operator of the interlocking lined a route for movement of that train from track No. 2 of the six-track line to track No. 3 of the eight-track line. He then moved a lever causing signal L108 to indicate Proceed. A signal maintainer, who was in the interlocking tower with the operator, said that because the operator then became occupied with other duties he volunteered to line the route through the interlocking for movement of the northbound CSS&SB train to track No. 4 of the eight-track line after the departure of No. 290. He said that when the track model board indicated that No. 290 had passed signal L108, he placed the lever controlling that signal to normal position, and that he then moved the lever controlling switch No. 107 to reverse position.

As No. 290 departed from the station on track No. 2 of the six-track line, the engineer and the conductor said that signal L108 indicated Proceed. The engineer said while the train was moving on track No. 3 and over switch No. 107 at a speed of 25 to 30 mph, the brakes became applied in emergency as a result of the derailment. An examination of the train equipment and the track structure disclosed that the derailment occurred as a result of switch No. 107 being moved from its normal position, which is for movement to track No. 3, to reverse position under the train while the third unit was moving over it.

The investigation of this accident disclosed no defect of the interlocking which would permit switch No. 107 to be moved while the track circuit of that switch was occupied; provided, that the contact arm of the emergency release device was in the normal position. The signal maintainer and the interlocking operator said that they had not opened the emergency release device to release the electric locking of switch No. 107 at any time of the day of the accident. It is apparent, therefore, that the emergency release device was placed on the contact connected to the electric locking circuit of Switch No. 107 at some time prior to the time of the accident, and that it had not been returned to normal position. This nullified the electric locking protection normally provided switch No. 107 and permitted the signal maintainer to operate switch No. 107 to reverse position during the movement of No. 290 over that switch.

The investigation disclosed that the emergency release devices associated with the interlocking machines were used not only in emergencies as required by rules and instructions, but that it was a practice of the interlocking operators to use those devices to expedite movements in the interlocking when emergencies were not involved. When the contact arm of the emergency release device was placed on the stationary contactor connected to the electric locking circuit of switch No. 107 at some time prior to the date of the accident, the record and notification relating to this use of the device were not made as required by instructions. The contact arm was not restored to normal position as required, and it is apparent that the signal maintainer was unaware that the contact arm was in position to release the electric lock-



ing protection afforded switch No. 107 when he moved the interlocking machine lever controlling that switch, thereby causing the derailment.

Accident of October 21, 1959

As No. 754 moved northward from the station at Kensington on track No. 2 of the six-track line, the engineer said that signal L108 indicated Proceed, and that after the train entered track No. 3 of the eight-track line its speed was about 40 mph. He said that when there was a variation in the normal movement of the equipment after the forward portion of the train had moved over switch No. 107, he immediately applied the brakes. The derailment occurred as the sixth unit of the train moved over switch No. 107, and the rear three units were derailed. Examination of the equipment and the track structure disclosed that the derailment occurred as a result of switch No. 107 being moved from normal position to reverse position under the train while the sixth unit of No. 754 was over the switch.

About 6:50 a.m., the interlocking operator at Kensington lined a route for movement of No. 754 on track No. 2 of the six-track line from the station to track No. 3 of the eight-track line. Another northbound train was to follow No. 754, and it was the operator's intention to divert the following train to track No. 4 of the eight-track line at switch No. 107. The operator said that when No. 754 passed signal L108 he placed the lever controlling this signal to normal position. He said he then moved the lever controlling switch No. 107 from normal position to the position where he expected that it would be restricted from further movement by the electric locking normally provided switch No. 107 while a train was occupying the track circuit of that switch. He said, however, that the lever was not restricted from further movement, and that he was enabled to move it to reverse position, which indicated to him that No. 754 had cleared the track circuit of this switch. He then looked at the track model board and observed that it indicated the track circuit of switch No. 107 was still occupied. The accident occurred when the lever was moved from normal position to reverse position while No. 754 was moving over switch No. 107. The operator said that the emergency release device was not used by him on the day of the accident, and that the cabinet enclosing this device was sealed.

As a result of the accident of June 21, 1959, the carrier decided to rearrange the circuits of the emergency release device in such a manner that would prevent a recurrence. On October 20, the day before this accident, employees of the carrier began to rearrange the circuits and this work was suspended about 1:00 a.m. the following morning. The supervisor of these employees said that the required tests were not applied to the circuits that had been changed, and that it was intended to apply the tests after the rearrangement of circuits had been completed. The accident occurred shortly before the employees returned to complete the circuit changes and make the required tests. After the accident, an inspection of the emergency release device disclosed that the wiring of this device had been unintentionally rearranged in a manner which eliminated the electric locking protection normally provided switch No. 107. This condition enabled the interlocking operator to change the position of switch No. 107 while No. 754 was occupying the track circuit.

The rules of the carrier provide that an interlocking lever operating a switch must not be moved when any portion of a train or engine is standing on or closely approaching the switch. It is required that when electrical circuits of an interlocking are changed or rearranged they shall be tested to insure operation in conformity with plans and instructions. When any work is to be done on an interlocking plant which may affect the safe operation of trains, an understanding must be reached with the operator on duty to insure safe operation. The work must not be left until the apparatus has been operated and is known to be in safe working condition. In this case, the interlocking operator did not wait before operating the interlocking machine lever controlling switch No. 107 until No. 754 had cleared the track circuit of that switch, as required by the rules. In addition, the employees engaged in making the circuit changes did not apply the required tests to the rearranged circuits of the emergency release device before work was suspended on the morning of the accident. It is probable that if the required tests had been applied to the rearranged circuits, the improper wiring of the emergency release device would have been detected and corrected. This would have afforded normal electric locking protection for switch No. 107, and would have prevented the interlocking operator from operating that switch while its track circuit was occupied by No. 754. The carrier has since corrected the conditions disclosed by these investigations.