



# IronWood Technologies

Railroad Accident Reconstruction

## Federal Railroad Administration

### False Proceed Signal Database

January 1, 1995 through May 3, 2004

All Reports - Long Island Rail Road Company

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
----------	------	-------------------	--------------	--------------	---------------	-------------------	--------------------	----------	--------------------------

**Cause**

**Narrative**

525	10/25/1995	LI		Remote		1624	Signal Circuitry	Divide Interlocking	N
-----	------------	----	--	--------	--	------	------------------	---------------------	---

**Human Error - Signal Circuit Design Error, Inadequate Service-Testing**

At Divide Interlocking, an eastbound route was displayed for train 1624, to route the train from Main Line #2 Track, 3-2E signal, to Station Track #2, 3-2W signal. In addition, a stored route had been established for train RF-31 from Station Track #1, 3-1W signal to Main Line #2, 3-2E signal. The track circuit 3-A1TR, which is the first circuit east of 3-2E signal on Main Line #2, momentarily de-energized (flipped). This caused the previously established route (3-2E to 3-2W) to reset, enabling the stored route (3-1W to 3-2E) to be established via a back to train stick feature. Signal 3-1W then displayed a RESTRICTING aspect.

**Corrective Actions:**

1. The back to train stick features were disabled.
2. Conflicting stored route operation was prohibited via a computer warning on the "CRT" and written procedures from the Transportation Department.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
			Cause						
			Narrative						

702 10/5/2002 LI Manual NA Track Stick Relay (13TS) Queens Interlocking, Queens, New York N

**Failed Equipment or Device - Electrical Ground (not in underground or aerial cable)**

Sequence of events: On Saturday, October 5, 2002 at 8:25am the Block Operator at Queens Tower reported that the indication for 12R signal at Queens Interlocking remained lit after the passage of eastbound train #6710 on track 4. Block Operator was able to restore 12R lever to the center position and cancel signal. A restriction was immediately placed on the affected track and route. Signal personnel were immediately dispatched to the interlocking.

Failure cause: Upon arrival at the location, signal personnel simulated the train move. The route was 12R to 12L with 13, 21 & 23 switches normal. The simulated move included, displaying 12R signal, then shunting the track circuit in advance of the signal (4TR), then the tripping track circuit (13TR) and finally the leaving track circuit 12TR. While shunting the 13TR track circuit, signal personnel observed that aspect on 12R signal remained displayed at CLEAR. Further investigation determined that the 13TS (Track Stick) relay was falsely energized while the 13TM (Track Repeater) was de-energized. This caused the signal to remain at CLEAR.

The cause of the 13TS relay failure was found to be a grounded wire (13TS1) on the positive control. The wire ground measured 10mA and 12VDC. The 13TS relay is energized through a single broken circuit with common always on the relay.

Repair & testing: The wire was immediately replaced and the ground was removed. The train move/route was re-simulated and found to be working properly. In addition, all wires in similar single break circuits were replaced.

Recommendations: Due to this failure we are inspecting other interlockings that have similar single broken circuits for the same possible wire problems.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
----------	------	-------------------	--------------	--------------	---------------	-------------------	--------------------	----------	--------------------------

716	8/22/2003	LI		Manual		N/A	Signal Control Relay (16RBHB)	Jay Interlocking, Jamaica, New York	N
-----	-----------	----	--	--------	--	-----	-------------------------------	-------------------------------------	---

**Failed Equipment or Device - Interior Wiring**

Sequence of Events:

On August 22, 2003 at 10:20am the Block Operator at Jay Tower reported that the indication for 16R signal at Jay Interlocking remained lit after the passage of eastbound train #4308 into #1 layup track. Block Operator restored 16R lever to the center position and was able to cancel signal. The signal was removed from service immediately and a block was placed on the affected track and route. There were no trains following the first train. Signal personnel were immediately dispatched to the interlocking.

Failure Cause:

Upon arrival at the location, Signal personnel simulated the route. The route was 16R to 14L with 7, 9, & 13 switches reverse and 11 switch normal (see Attachment A). They displayed 16R signal and they shunted the tripping track circuit (7TR) and observed a RESTRICTING signal aspect displayed on 16R signal. In addition, they observed the 16RBHB relay energized with the 7TS (track stick) deenergized. This resulted in a RESTRICTING signal being displayed when it was not intended. The cause of the 16RBHB relay remaining energized was found to be grounded positive energy wires between switch lever bands in the Model 14 Interlocking Machine. The circuit was meggered and found to be grounded. The wires are old style TC Green. The 16RBHB circuit is not a true double broken circuit (see Attachment B), only the 16R band breaks the common energy, and in this case the 16R band was made making the circuit effectively single broken. In addition, the grounded wires were further proven to be the cause by trying an alternate route from the same signal. This resulted in the circuit working properly.

Repair & Testing:

All of the wires in the route for the 16RBHB were replaced and the ground was removed. We field tested all applicable relays, meggered, cross meggered and circuit meggered all applicable wires and cables, and tested the 7TR track circuit. The train move/route was re-simulated and found to be working properly.

Recommendations:

We have continued rewiring all the single broken circuits at our last few TC Green interlockings. It is a painstaking task because every wire you replace in a bundle of hundreds of wires could cause an adjacent wire to fail. The Jay Interlocking Model 14 machine is scheduled to be replaced entirely by the end of 2004. This will eliminate all TC Green at Jay. We will continue replacing wires until the new system is cutover.

No. of Reports Shown in this Listing: 3