



## IronWood Technologies

Railroad Accident Reconstruction

## Federal Railroad Administration

### False Proceed Signal Database

January 1, 1995 through May 3, 2004

All Reports - Cause: Foreign Current Induced in Track Circuit from Adjacent Power Lines

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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22	1/24/1995	NS	CTC			5158	Foreign Current	Corinth (Blanchet), KY	N
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Train No. 388 was stopped on Track #2 at Blanchet waiting on Train No. 108 to clear the block ahead. Meanwhile, Train No. 108 was running northbound, Track #2, on an APPROACH indication waiting for two southbounds to clear the single track ahead. The dispatcher had requested the northward signal for No. 388 at Blanchet so that it would come in once No. 108 could get a signal and clear the block. The crew on No. 388 reported observing that the signal at Blanchet displayed an APPROACH indication for about six (6) seconds and then went back to a STOP. At this point in time the crew knew that No. 108 was still in the block ahead and reported the false proceed signal they had observed.

Signal personnel investigated and determined that the cause was foreign current causing the coded track relay at Blanchet to chatter on the negative side, thus momentarily picking up the "H" relay for Track #2 while it was occupied. This occurrence was duplicated by observing signal equipment response whenever a northbound train passed a repeater cut section about two miles north of Blanchet. As the rear axle passed through the insulated joint stagger at the cut section, the track relay at Blanchet would chatter and very briefly pick the "H" relay. There was approximately 6.5 VAC foreign current present in the stagger at the cut section.

The problem was corrected by installing track reactors (in both tracks) at the Blanchet L-case in series with the respective track relays. Appropriate tests and inspections were performed to verify signal system integrity, and the signals were returned to service.

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36	12/24/1995	NS	CTC			Unknown	Insulated Joint	Stearns, KY	N
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At approximately 9:45 AM, Train No. 108 was moving northbound on track #2 at Stearns, KY when they observed an APPROACH DIVERGING signal for their movement. Knowing they were to meet opposing southbound traffic at the end of the double track (the next signal), they expected to get an APPROACH indication at Stearns. Engineer reported the incident to the dispatcher and proceeded on to the end of double track at Whitley where he had a STOP indication as expected.

The signal maintainer was arriving at Stearns to investigate a previously reported loss of train indication in the block where the false proceed signal was encountered. He was waiting on the traffic to clear before starting his investigation when Train 108 observed the false proceed. After Train 108 passed, the maintainer opened the signal case and observed the coded track relays chattering, indicating the presence of AC on the rails. The amount of AC on the rails diminished during the day, and so the relays never picked to the point of causing a repeat of the false APPROACH DIVERGING signal. However, one of the insulated joints at the signal read as having a four ohm short. The intermediate signal at Stearns is designed to receive only a minus code for an approach and a plus code for an approach diverging. The track was taken out of service pending resolution of the problem.

The next morning, there was more induced AC read on the rails than on the previous day, but the insulated joint that had been shorted the day before now read over 65 ohms. However, by manually shorting out the joint, the relays chattered to the point that the "BD" relay falsely picked when only an "H" code was received resulting in a false approach diverging signal. Discussion with the local power company revealed that their load on a power line that crossed the track in the block was much higher in the morning than at other times of the day.

To correct the problem, the intermittently shorting insulated joint was replaced, and reactors were installed in series with all coded track relays in the block. Tests were then run to verify that the problem could not be duplicated by shorting an insulated joint at the Stearns signal location. The signal system on track #2 was then returned to service.

106	8/28/1996	UP	CTC	Automatic	ATC	CNW6905	None	Rochelle, Illinois	N
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On August 28, 1996, at approximately 0145 CDT on the Geneva Subdivision, westbound ELNP-27 was proceeding west on No. 2 Track at restricted speed east of M.P. 74.0 with a Restricting cab signal aspect. The cab signal aspect was Restricting as the home signal at the BN interlocking at M.P. 75.3 was displaying a Stop aspect. At approximately M.P. 74.0, the cab signal changed to a Clear aspect and remained Clear until changing back to a Restricting aspect at approximately M.P. 74.25.

An investigation revealed a high level of 120 Hz energy on the track originating from a track rectifier at the battery end of a DC track circuit which operated in combination with the feed transformer for the 100 Hz ATC.

The wiring for the track rectifier, battery, and ATC feed transformer was revised to a standard arrangement which minimizes the 120 Hz energy on the track circuit. The signal system was restored to proper operation, and all applicable tests were performed.

Report #	Date	Reporting Carrier	Block System Narrative	Interlocking System	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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257	3/9/2000	NS	AB			CR2898	Audio Frequency Overlay	Taylor, MI	N
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At approximately 3:45 p.m., Train L60L59 was leaving Oakwood Jct. on the Detroit District, Lake Region on an APPROACH indication into single direction ABS territory. They were following train L64. As train L60 approached automatic signal D-10.2, they observed a CLEAR signal. Aware that train L64 was working ahead, they passed this signal prepared to stop.

They stopped short of an open hand throw trailing point switch at MP D-11.2 and notified the Ft. Wayne Dispatcher.

C&S personnel investigated and determined that the circuit used to indicate the switch point position would not deenergize when power was removed from the transmitter. The switch indication is transmitted from the switch location to the signal location by a 1.2 kHz Audio Frequency Overlay (AFO) circuit. This area has high voltage transmission lines parallel to the track that may be a factor in the failure of the receiver unit to deenergize. The equipment will be sent to our Signal Repair Facility for further analysis.

A Phase Selective Overlay (PSO) circuit was installed in the place of the AFO and the signal system was tested and returned to service.

No. of Reports Shown in this Listing: 4