



IronWood Technologies

Railroad Accident Reconstruction

Federal Railroad Administration

False Proceed Signal Database

January 1, 1995 through May 3, 2004

All Reports - State of Missouri

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

Narrative

466	3/11/1995	ATSF	CTC			79	Trap Ckt	Kansas City, MO	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

Approximately 9:30 PM, March 11, 1995, Traffic Control Operator tried to clear westbound signal (54R) BN crossing over the 63 switch reverse. Then stacked a route to clear the eastbound signal (54LA) over the 63 switch normal. Signal (54R) would not clear and the GWRR switch engine was authorized to flag the Red (54R) signal. While the GWRR switch engine was flagging over dead section of the BN crossing frog, the 63 switch moved to normal position. Investigation by Signal Department determined the 53 trap circuit is not effective unless signal is cleared over the crossing frog dead section. As a temporary measure of protection, instructions were issued to the Traffic Control Operators to provide manual protection for similar type switching moves until circuit design changes can be installed that will provide route locking over the crossing frog regardless of position of the control signal.

31	9/18/1995	NS	CTC			Unknown	Signal	Maxwell, MO	N
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Phantom Signal - Due to Object in Foreground or Background

At approximately 7:40 AM, westbound SP Train CHRBM was in the BN siding east of Maxwell Control Point as eastbound BN Train 154 cleared them on the BN main track. Train CHRBM got a DIVERGING APPROACH indication on the leaving signal at the BN siding, and at the same time called out STOP indication which they saw on the next signal, the 48L signal at NS Control Point Maxwell. The 48L signal was about 1300' ahead of the train as it started to move out of the BN siding. The SP engineer stopped his train at a point about 780' from 48L signal to let vehicular traffic pass on highway crossing. At that location, the crew reported seeing 48L display Red over Yellow, DIVERGING APPROACH, and so the engineer started to move again toward Maxwell. When the train got within about six (6) car lengths from signal 48L, they noticed it was then Red over Red, STOP. The engineer was able to stop the train with only one truck of the lead engine past the 48L signal. The NS dispatcher had not lined a route for Train CHRBM, and this fact was verified later by reading data loggers.

Signal personnel were called to investigate and after making appropriate operational and FRA tests, were unable to duplicate the incident or find any problem with the signal system. A phantom signal was suspected and confirmed four days later under similar sunlight conditions. It seems that the rising sun was reflected partly by some aluminum signal cases on the north side of the track, and that contributed to the phantom. A 10-degree deflecting lens on the 48LB head was removed to lessen the chance of the phantom signal. The signal was realigned to account for track curvature. The 48L signal was also changed from approach to continuously lit due to the fact that a phantom has been seen on it, and a dark signal is more susceptible to a phantom aspect.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
531	11/8/1995	KCS	CTC			746	?	Noel, MO	N	
			Phantom Signal - Due to Foreign Light Source							
			At 23:03 hrs on 11/8/95 northbound Extra Train 0006 of the 7th reported going by signal #2046 (approach signal to South Noel) with a CLEAR indication and arrived at South Noel with a Red absolute signal. The train got by the absolute signal but was able to stop before any further incident. Please review attached statement from the Signal Supervisor for more information from testing and from crew interviews. Also find attached a consist report and a train report from dispatchers office.							
			[From the Signal Supervisor's report] The report was investigated by the Signal Maintainer and myself. We were unable to reproduce the reported conditions. Also nothing was found that would contribute to the reported occurrence, such as grounds or relays out of spect [sic]. We did find that at a place about a mile north of signal #2046 where a street light could possibly be mistaken for a Green signal off in the far distance. This light might very well be mistaken for a signal in the distance if someone was not alert and was not sure of his location.							
			While later talking to the engineer, I asked him about this possibility, but he did not think so. The brakeman told me that he did not see the aspect of the approach signal which leads me to believe that the crew was not calling signals that night.							
103	4/19/1996	UP	AB			FARWRC-15	Spring Switch	Woolridge, Missouri	Y	
			Failed Equipment or Device - Switch Components Damaged by Dragging Equipment							
			On April 19, 1996, at 2008 CDT on the River Subdivision, eastbound FARWRC-15 accepted signal 1570 with a CLEAR aspect at the west end of Woolridge and derailed the lead unit on the spring switch which was not in the full normal position.							
			An investigation revealed that the previous train, westbound LNJ57-19, had come out of the siding with dragging equipment and bent the switch circuit controller lug and connecting rod in such a manner that the switch point was obstructed and held gapped open from normal while the switch circuit controller indicated normal.							
			The signal system was restored to proper operation, and all applicable tests were performed.							
64	5/21/1996	BNSF	CTC			Train 1-121-20; 1-1	Color Light Signal	South Elwood, MO	N	
			Vandalism - Signal Damaged, Caused Phantom Aspect							
			At approximately 0930 hrs train 120 (southbound holding main) reported that while making a meet with train 121 (northbound entering siding) at South Elwood that Signal 14LB southbound signal on siding was Lunar. Signal 14LB lower unit had been shot with a small caliber rifle breaking inner red lens giving the appearance of a lunar signal. Replaced outer and inner lens color test performed all OK. Time reported OK at 1100 hrs.							

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72	9/26/1996	BNSF	CTC			Westbound BN Trai	Intermediate Signal 244.6 (A Head)	Springfield, MO	N
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Failed Equipment or Device - Interior Wiring

Westbound train 91817-26 looked back and observed eastbound signal 244.6 Yellow over Red as they were passing. Train crew stopped train and advised Dispatcher. Dispatcher held 91817-26 until Maintainer, Inspectors, General Construction Supervisor, and Trainmaster arrived at location. With all Signal personnel present the Yellow over Red aspect was verified with train 91817-26 setting on main track with cars setting east and west of signal. Upon investigation it was found the control circuit for the A head H2 mechanism had foreign battery on it holding the top signal Yellow. A ground and cross test was performed on the wires going to the H2 and revealed crossed wires but no current flow to ground. The source of foreign battery was found to be coming from the negative light battery (-B) and positive battery from the +B circuit for the mechanism. Further inspection revealed all wires from the case to the mechanism were bare (insulation wore off) where the wires were routed from the mast into the flexible conduit going to the H2 unit. Wires were replaced to the A and B signal mechanisms and tests performed. Signal OK for normal use at 7:06 PM.

154	3/21/1997	UP	CTC			UP9453	None	Kansas City, Missouri	N
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Vandalism - Instrument Case, Cable, or Junction Box Damaged

On March 21, 1997, at 17:50 CST on the Kansas City Terminal Subdivision, CRMWL-20 was east bound stopped on Track No. 2 across the insulated joints occupying both the east and west track circuits at the intermediate signal location at Mile Post 280.4. The westbound signal at Mile Post 280.4 was observed displaying a Yellow over lunar.

An investigation revealed the signal cabin at Mile Post 280.4 had been hit and knocked a foot off center dumping all the relays in the house.

The relays were all righted, the signal system was restored to proper operation, and all applicable tests were performed.

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113	5/12/1997	BNSF	CTC			H-MCKC4-10	None Noted	Sibley, Missouri	N
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Scenario Reenacted, Unable to Duplicate, No Defects Found

At 1430 hours on May 12, 1997 westbound train H-MCKC4-10 reported that the westbound approach signal, 4221, was Flashing Yellow and the next signal at the East End of Sibley was Red. The dispatcher had an eastbound lineup at East Sibley from single track to the south track for the P-PXWSI-10. The H-MCKC4-10 was westbound on the north track approaching the end of double track at East Sibley.

The train crew consisted of Engineer and Conductor. They stated that the signal displayed what they perceived as a normal Flashing Yellow aspect until they were approximately 3-4 car lengths from the signal when it changed to a solid Yellow. The crew stated that they thought the dispatcher had pulled down the lineup and forgot to notify them. They had no problem making a normal stop at E. Sibley. The signal was lit upon arrival by the signal inspector and the signal displayed a solid Yellow aspect. The signal in question does not display a Flashing Yellow aspect. Signal tests were performed as follows: checked office logs, tested relay contacts for high resistance, looked for loose connections, inspected pole line, and inspected signal via train ride. No defects were noted and were unable to duplicate condition reported.

As a precaution, the light control unit and light bulb were changed.

121	9/12/1997	BNSF	CTC			UP LNJ5812	Alleged 2R Signal	Eton, MO	N
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Phantom Signal - Due to Sun Angle

Eastbound UPRR train LNJ5812 was stopped at Eton on south track at the 4R signal. An eastbound train on the north track was crossing over from north to south track. The engineer and conductor on the UPRR train stated that as the train on the adjacent track was going under the 2R signal on the north track that the signal was going from Red over Red to Red over Yellow. This occurred numerous times. This was not the signal for EB movement on the south track for the UPRR train.

Due to a communication error between the dispatcher and signal controller, the wrong signal was investigated by field personnel. The signal team investigated the eastbound signal on the south track. They looked at the field logs, office logs and did a reenactment. The replay did show that the switch went out of correspondence momentarily, and a bad order 4TU timer were found. These two problems did not cause the signal to change aspect as reported but were found and repaired while testing. Another field investigation was accomplished on October 2 and 3, 1997. The proper signal was investigated with no exceptions.

The outer 10 degree deflecting lens and phankill units were removed from all signals at this location on 9-17-97 to reduce this potential of sunlight being reflected into the signal.

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			Cause							
			Narrative							
178	12/11/1997	UP	CTC			UP 3539	None	Pace, MO	N	
			Vandalism - Signal Damaged, Caused Unintended Signal Aspect							
			On December 11, 1997 at 09:25 CST, on the Sedalia Subdivision at Pace, Missouri, eastbound MKCAS-09 observed the eastbound approach signal on track #1 at milepost 59.0 indicating a Yellow over Yellow signal, with the eastbound home signal on track #1 at CP M058 indicating a Red signal.							
			An investigation revealed the eastbound approach signal at milepost 59.0 had a bottom signal head that has one light which is yellow. The access door to the bottom signal head was open and sunlight shining into the back of it gave the appearance of a Yellow signal on the bottom head.							
			The signal system was restored to proper operation, and all applicable tests were performed.							
205	4/23/1998	UP	CTC			UP 469W	None	Centertown, MO	N	
			Phantom Signal - Due to Sun Angle							
			On April 23, 1998 at 10:10 CDT, on the Sedalia Subdivision at Centertown, Missouri, westbound WPFLWB21, while stopped in the siding 200 yards east of control point M142, observed a Yellow indication from the signal to leave the siding, with the switch lined normal.							
			An investigation revealed a phantom indication in the signal to leave the siding was caused by the sunlight washing out the Red signal and making it appear Yellow.							
			Shields were applied preventing the phantom signal, and all applicable tests were performed.							
211	8/7/1998	UP	CTC			UP00159	None	North Riverside, MO	N	
			Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)							
			On August 7, 1998 at 13:30 CDST, on the De Soto Subdivision at North Riverside, Missouri, southbound LSE57-07, at Mile Pole 26.30, observed a CLEAR southbound signal at CPD026, and a Red southbound signal at CPD027.							
			An investigation revealed that a line wrap in the HD circuits between D026 and D027 allowed the 61H and 61D relays to pick up falsely at D026.							
			The signal system was restored to proper operation, and all applicable tests were performed.							

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			Cause							
			Narrative							
190	11/17/1998	BNSF	CTC			UPSACD, Engine #	70 L Signal	Kansas City, MO	N	
			Human Error - Field Wiring Error, Inadequate Service Testing							
			The UPSACD was a northbound train approaching the 70L signal at Tower 8, Sheffield, on the KCS Railroad. The train reported that the 70L displayed a Red over Green aspect with the next signal, 66L, displaying a Red aspect. Signals were tested and found to be as reported. The cause was due to a wiring error in the signal control circuit. Circuit was corrected and signals tested and restored to service on 11-18-98 at 0200 hours.							
200	12/4/1998	NS	AB			9003	Poleline	Foristell, MO	N	
			Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)							
			At approximately 12:10 AM, train #256 with crew consisting of Engineer, Student Engineer, and Conductor were eastbound at West End Foristell when they observed the eastward signal go from RESTRICTING to CLEAR. The next signal, at East End Foristell, was then observed to be displaying APPROACH. The preceding train, #282, was in the block ahead of East End Foristell and, hearing #256 call these signals over the radio, contacted #256 to confirm the calls. Train #256 then aware that the signals had malfunctioned, slowed in sufficient time to avoid #282 and reported the problem to the Berkeley Operator.							
			Signal personnel were advised of the situation, investigated and were able to duplicate the problem. The cause was traced to a line wire wrap at about milepost S-50. A three wire DC HD line wire signal control system is employed in this territory. The wrap was between the opposing signal HD wires and did not involve the common. The condition resulted in a more restricting signal for the first train, #282, but when that train occupied the second of two track circuits in the block, a path was set up by the wrap that gave a false APPROACH aspect on the East End Foristell eastward signal into the block that [unintelligible] was what #256 had observed.							
			The wrap was cleared and the signals were tested for normal operation. Though not confirmed, it is likely that brush clearing activities the previous day had caused the wrap.							
191	12/28/1998	BNSF	CTC			L5OE8151-27	SA Signal 42RA	West Aurora, MO	N	
			Human Error - Field Wiring Error, Inadequate Service Testing							
			At approximately 0040 hours, December 28, 1998, westbound train L5OE8151-27, reported a Green main line signal at East Aurora, Yellow at West Aurora and Red at Interlocker Aurora. Signal at East Aurora should have been Yellow for westbound movement, account 2D signal at Interlocker. On 12-16-98 signal 42RA at West Aurora had cable and light head changed out. Jumper on the GY repeater circuit of this signal had been mistakenly installed. The error was not discovered during operational checkout. The jumper was removed and system tested at 0400 hrs on 12-28-98.							

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614	4/15/1999	KCS	CTC			BN 6307	Wiring	Mulberry, MO	N
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Maintenance - Wiring Chewed by Rodents

At 17:20 hrs on 04/15/98 train #076214 North with engine BN6307 with Engineer, Conductor, and a consist of 0 loads, 79 empties, 2471 tons and 4854 feet, was traveling northbound at Mile Post 116, North Mulberry where he received a Green signal. This is the approach to the KCS/BN Interlocker, Mile Post 114.6 at Arcadia, KS. Upon arrival at the interlocker they had a Red signal and shortly after a BN train pulled through the interlocker. Signal Supervisor, Signal Maintainer, and Signal Inspector investigated the report and were able to reproduce the reported failure. Please find attached statement of findings by Signal Supervisor and a train report for the reporting train.

[Statement by Signal Supervisor]

At about 17:30 hrs. on 04/15/99 I was notified by the Signal Desk that a northbound train had reported receiving a CLEAR northbound signal at North Mulberry; which is the northbound approach signal to the KCS/BN interlocking at Arcadia, KS. When the train got to where it could see the color of the interlocking home signal, it was Red. The KCS train also reported that it was only a very short time before a BN train went across in front of them.

The Signal Desk contacted the BN to have their personnel to check the interlocking tapes as the interlocking is their maintenance.

I contacted our Signal Maintainer to go check on our approach signal to verify that it would be no better than Yellow when the home signal was Red. While I was still in route to North Mulberry, [redacted] contacted me by cell phone and informed me that the approach signal would come up CLEAR (Green) with the interlocking home signal at Red. I confirmed that we would not have any other KCS train moves that would be affected by this condition and instructed [redacted] to remain there and wait until I arrived.

When I arrived, I confirmed [redacted] observations and we began to investigate the system. In our test we were able to determine that the 44YGPR relay in the KCS case at the interlocking was being held up by stray battery. The relay repeats the Yellow and Green aspects of the northbound home signal at the interlocking. It also determined the codes to be transmitted to the northbound approach signal. It was determined that there were no grounds on the circuit, but there was stray positive battery. Through further investigation, it was determined that a rodent had chewed into one of two four-conductor unshielded cables used between the junction box at the bottom of the home signal pole and the SA signal head at the top. There were no signs of the rodents in the junction box or the signal head, but they had gotten into the pole itself from the opening at the bottom of the spider-type foundation and chewed through the insulation of the cable that contained the B10 and the 44YGPR wires. They also chewed some of the actual wire strands and frayed them enough that there were strands of one conductor touching the other and introducing the B10 battery onto the YGPR wire all of the time.

We replaced the cables in the pole and made follow up tests. We sealed the foundation bottom and base openings.

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			Cause							
			Narrative							
228	5/30/2000	BNSF	CTC			ZNBYWSP2-28A,	None	Courtney, MO	N	
			Loss of Shunt - Possible Rust or Foreign Material on Rail							
			Train ZNBYWSP2-28A, traveling eastward on main track 1 between Congo and Courtney, following a single 4 axle unit, BNSF 2600, train WHMOHMO1-30, observed automatic signal 4414 upgrade to CLEAR from Red and then go back to Red. Engine BNSF 2600 was in the block ahead of the ZNBYWSP2-28A. Signal Supervisor, Signal Inspector, and Signal Maintainer investigated the incident by downloading logs from the Electrocode track circuits and confirmed that engine BNSF 2600 had lost shunting and allowed signal 4414 to upgrade. The track circuits were tested for shunting sensitivity with 0.06 ohm shunts with no exceptions taken. Dispatcher instructions prohibit allowing following moves behind single engines on BNSF. The dispatcher had erred. A copy of Rule 44.5 from the dispatcher's manual is attached.							
277	9/1/2000	UP	CTC			UP3074	None	Dexter Junction, MO	N	
			Loss of Shunt - Possible Rust or Foreign Material on Rail							
			On September 1, 2000 at 5:48 CDT at Dexter Junction on the Jonesboro Subdivision, southbound MINPB 01 on the main track at mile pole 40.3 reported the southbound signal (4L) displaying a Green aspect and as they proceeded they encountered the northbound LSV5O 01, a local with a single 4-axle unit, in the same block.							
			An investigation revealed an oil film was present on the rail between Dexter Junction and Bernie causing a loss of shunt. It is unknown as to the origin of the oil film and it is under investigation.							
			The oil film was removed and the signal system operated as intended.							
286	2/24/2001	BNSF	CTC			P EPEKCK1 24A En	None	Camden, MO	N	
			Human Error - Signal Circuit Design Error, Inadequate Service-Testing							
			Train P EPEKCK1 24A, traveling west on main track 3 (Norfolk Southern track), observed a Red over Flashing Yellow on the 6L (Norfolk Southern signal) at CA Jct. Control Point, for a move from main 3 to main 1. The signal should have displayed Red over Yellow. This signal had been overlooked when plans were issued to change the Red over Flashing Yellow to Red over Yellow on this Subdivision to conform to current BNSF signal aspects. Temporary circuit changes were made to correct the condition until permanent circuit plans are issued. The Signal was tested and placed back in service.							
287	3/12/2001	BNSF	AB			C CAMRTR001, En	None	Elesberry, MO		

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			Cause							
			Narrative							
337	4/7/2001	BNSF	CTC			ID # EMLMEBM001,	1WA Signal	Napier, MO	N	
			Maintenance - Wiring Chewed by Rodents							
			<p>At approximately 19:23 hours the train crew on the BNSF 9956 reported that as they approached the westbound absolute signal governing movement from Main Track Two to the Main Track at West Napier the signal went from a STOP indication to an APPROACH indication, back to STOP. It did this several times with a train in the block ahead. The train ahead was a westward train ID # EMAHCDM001A, that had made a movement from Main Track One to the Main Track. The Dispatcher had entered a stack that would automatically throw the switch and request the 1WA signal, when the OS was unoccupied. Investigation by signal personnel could not recreate the problem, however, the data recorder within the code unit, a Harmon Logic Controller and the train logger in Fort Worth verified the report. Further investigation revealed that mice had eaten the insulation off several of the flex wires going from the junction box of the signal to head. Insulation was missing off the WA-RP (Red Repeater) and the WA-NHD (control for the APPROACH aspect). This is a GRS H2 searchlight signal with a Safetran junction box and mast. The flex wire was replaced and the signal system tested with no other problems found.</p>							
683	12/2/2001	KCS	CTC			KCS 685	Vandalism	Jaudon, MO	N	
			Vandalism - Signal Damaged, Caused Unintended Signal Aspect							
			<p>At 14:21hrs on 12/2/01, train #RUN8, (IFG Local), with Engineer and Conductor, with a consist of 0 loads, 20 empties, 800 tons and 2169 feet was in the siding at the south siding switch at Jaudon waiting on a meet with train #000230, (KCSH North), with Engineer and Conductor, and a consist of 21 loads, 15 empties, 2813 tons and 2281 feet. RUN8 was aware of the meet and was told that the north bound train #000230 was lined north up the main line by the siding switch. The crew on RUN8 notified the signal desk that the trailing signal out of the siding was displaying a Lunar (RESTRICTED signal). This location is not capable of displaying a Lunar. Upon investigation of the report by Signal Maintainer [redacted], it was discovered that the SA mechanism had been vandalized, shot by a rifle which knocked out the red lens but didn't break the bulb.</p>							
342	10/30/2002	BNSF	CTC			L-CHI0081-30A	None	Ethel, MO	N	
			Human Error - Signal Circuit Design Error, Inadequate Service-Testing							
			<p>Train L-CHI0081-30A light power, was following train Z-WSPSBD9-30B operating westbound on Main Track 1. Westbound absolute signal at West Ethel was lined to make a follow-up move for the L-CHI0081-30A. The crew operating the L-CHI0081-30A reported that the westbound absolute signal at West Ethel displayed an APPROACH aspect. The westbound absolute signal should have displayed a STOP aspect due to the Z-WSPSBD9-30B occupying the block between West Ethel and the intermediate signal at MP 333.2. The crew stopped their train at MP 332.6, which is approximately 0.5 mile from the rear of the train ahead.</p> <p>Signal department employees were dispatched to the location. Operational tests were conducted to simulate the train movements and events. The tests confirmed the report by the crew on the L-CHI0081-30A.</p> <p>The false proceed was caused by an engineering design error. The design error was not detected in signal service testing. Circuit modifications were made to correct the problem and the signal system was tested with no further exceptions being taken.</p>							

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			Cause							
			Narrative							
376	3/6/2003	BNSF	CTC			ZWSPKCK906	None	Gorin, MO	N	
			Scenario Reenacted, Unable to Duplicate, No Defects Found							
			SOC reported that at 12:10 am, the westbound Z-WSPKCK 9 06 had gotten by a Red signal on Main One at Gorin, MO. Crew alleged that the absolute signal displayed a CLEAR aspect and that the 2741 signal displayed a CLEAR aspect. Data logs from recorder at Gorin were retrieved and determined from the information that the westbound absolute signal displayed a STOP indication. Logs from NOC and data log retrieved from Gorin revealed that an eastbound signal was cleared through the west crossovers. Westbound train trailed through the west switch located on main track one. Signal system was set up in the same manner that existed. Signal aspects were checked, there were no exceptions taken, all signals worked as intended. Relays and signal mechanisms were tested, cross battery and ground tests were performed and no exception taken. Indication locking was performed on the 2L signal. Signal system was found to be working as intended.							
377	4/5/2003	BNSF	CTC			Gateway Railroad	54 LB Signal	Kansas City, MO	N	
			Human Error - Field Wiring Error, Inadequate Service Testing							
			A Gateway Railroad switch engine crew on April 5, 2003 reported observing Red over Green aspect at the 54 LB signal, and stated they stopped short of the next signal (50L) displaying a Red aspect. Signals were put to STOP and traffic was suspended over said route. Investigation revealed that report by crew was factual. Investigation also revealed that during a cutover March 27, 2003 changes had been made to correct a wiring error, but related signals were not re-tested. Circuit changes were made to correct the wiring error and all signals were tested without exceptions. Signal 54 LB put back in service April 5, 2003.							

No. of Reports Shown in this Listing: **25**