



# IronWood Technologies

Railroad Accident Reconstruction

## Federal Railroad Administration

### False Proceed Signal Database

January 1, 1995 through May 3, 2004

All Reports - Burlington Northern and Santa Fe Railway Company

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
1	10/29/1995	BNSF	CTC			BN 9509	Wiring Error	West Antelope, WY	N
<b>Cause</b>									
<b>Narrative</b>									
<p><b>Human Error - Field Wiring Error, Inadequate Service Testing</b></p> <p>At approximately 13:00 hours on 10/29/1995 eastbound train lead locomotive BN 9509, Conductor and Engineer reported intermediate signal at MP 28.1 displayed Green aspect. Next location West Antelope train went on to diverging route with a Red over Green signal displayed. Signal system was tested and wiring error was found. During circuit changes for a signal cutover on 10/27/1995 a wiring error was made. Normal switch correspondence check was inadvertently left out of the pole change circuit feeding line circuits between West Antelope and intermediate signal at MP 28.1. Wiring error was corrected, signal system tested, and placed back in service at 16:36 hours on 10/29/1995. Attachments include diagram of train movement and portion of signal circuit plan. Investigation scheduled for signal employees involved.</p>									
2	11/6/1995	BNSF	CTC			Train #1347	Signal 2136.3	Galva, IL	N
<b>Vandalism - Pole Line</b>									
<p>Dispatcher reported an unsolicited CLEAR aspect on the westbound absolute signal at Galva on Main track #2. Amtrak #1347 westbound on Main #1 verified to Signal Supervisor that the approach signal on Main #2, Signal #2136.3, displayed an APPROACH MEDIUM aspect with the absolute signal at Galva displaying a STOP aspect. Amtrak had been instructed to stop at Galva even though the train was not on the track affected.</p> <p>Wire thieves stole copper communication wires at MP 136.9. There were (12) twelve spans of wire stolen. The tails of the copper wire that were left were laying in the signal wires. This caused the 2136-FYR relay to falsely energize thus causing the signal at 2136.3 to be display an APPROACH MEDIUM aspect in lieu of an APPROACH aspect.</p> <p>Correction: Removed all copper wires that were hanging down in the open signal wires. Made operating tests and left working ok.</p>									
3	12/1/1995	BNSF	CTC			1-4108-1	Int. 1248.2	Radnor, MT	N
<b>Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)</b>									
<p>A tree fell into the poleline at MP 1247 causing the D and DD to become wrapped. This caused the signal at 1248.2 to upgrade from Flashing Yellow to Green. Train crews reported next signal (approach to West Radnor) as Yellow and West Radnor as Red over Lunar. Although braking distance was okay for these signals, the fact remains that signal 1248.2 should have been FY for this movement. Line wire wrap removed and signals returned to service.</p>									

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			<b>Cause</b>							
			<b>Narrative</b>							
4	12/12/1995	BNSF	CTC			Train 01-131-12	Power Switch	Afton, OK	N	
			<b>Human Error - Improper Circuit Jumper in Place</b>							
			Replaced crossover switch machine (67sw) on main track number 2, Afton, OK. When crossover was requested reverse, switch 67A on main track number 1 did not throw reverse and stayed in the normal position. Switch 67 on main track 2 threw reverse and crossover indicated reverse through incorrect jumpers in 67sw allowing signal 68RB to display false proceed signal through crossover. Train ran through switch on main number 1. Removed incorrect jumpers and tested crossover, system functioned as intended.							
5	12/19/1995	BNSF		Remote		1-G83-18	Alleged 1NA Signal	21st ST. Interlocking, Tacoma, WA	N	
			<b>Scenario Reenacted, Unable to Duplicate, No Defects Found</b>							
			Train 1-G83-18 northbound on -1 between Ruston and 21st Street Interlocking reported they had an APPROACH indication at signal 1.6 and when they got to 21st Street Interlocking, crew claims signal 1NA went from APPROACH indication to Red. Dispatcher logs show that no signal was requested and that no signals at this location indicated CLEAR.							
			Tested signal heads, cable, interlocking, and indications back to office - all tests completed with no exceptions taken. (When signal is positioned to other than the Red position with no request from the dispatcher, signal shows as an unsolicited CLEAR and is logged in the log files.)							
54	1/5/1996	BNSF	CTC			Amtrak 1796	None	Ostrander, WA	N	
			<b>Scenario Reenacted, Unable to Duplicate, No Defects Found</b>							
			Amtrak 1796 reported that they had a Green signal at signal 96.2 and a Green over Red at Ostrander Control Point Northbound Main 1 however they went through the crossover from Main One to Main 2. Crew on train 53-866 stopped on Main 2 reported observing the signal line up as a Red over Green for Main One. Testing performed was tested for grounds, tested signal mechanism heads, route locking, approach locking, verified data recorders for the control office and for Signal 96.2.							
			No exceptions taken to the signal system.							
55	1/29/1996	BNSF	CTC			P-CHLA1-29 Engine	FR-2	Edelstein, IL	N	
			<b>Failed Equipment or Device - FR-2</b>							
			Westbound Train P-CHLA1-29 reported passing Signal 1361 displaying a Green aspect and next signal, westbound control signal at Edelstein, was Dark over Red. Maintainer and Inspector found the FR-2, the device that supplies lamp voltage, was partially failing, causing the top lamp on the westbound control signal to be very dim, but enough current to hold the light out relay. The defective FR-2 was replaced, the light out relay tested for proper operation and signal system tested.							

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			<b>Cause</b>						
			<b>Narrative</b>						
56	2/11/1996	BNSF	CTC			Train #01-127-11	Signal 116R	South Amory, MS	N
			<b>Scenario Reenacted, Unable to Duplicate, No Defects Found</b>						
			Northbound BNSF 01-127-11 stated that northbound signal 116R, South Amory displayed a Green over Red aspect. The next signal, 124RA, North Amory displayed a Red aspect. At this time, North Amory was lined for a southbound move with a reverse switch.						
			Signal Supervisor and Maintainer investigated. Incident could not be duplicated. Signal operation center log indicated no exceptions.						
			Operational tests and inspections were performed with no exceptions noted.						
			A recorder was installed at South Amory to monitor signal operation.						
57	2/20/1996	BNSF	CTC			Boeing Switcher	Full Wave Rectifier	Mukilteo, WA	N
			<b>Failed Equipment or Device - Full Wave Rectifier</b>						
			Boeing Switcher reported that the 2W (westbound signal main 2) signal appeared to be Flashing Red over Red but was very dim. Signal Maintainer found the W-EB full wave rectifier was shorted and causing the 2WLOR relay to pick and drop. With the 2WLOR picking and dropping the voltage to the red bulb was low (5 vac) and pumping, giving the appearance of a dim Flashing Red signal. Signal Maintainer dropped the power off relay to light the signal on DC and bypass the full wave rectifier as a temporary fix. Permanent repairs made to eliminate the full wave rectifiers and use only DC lighting.						
58	3/1/1996	BNSF	CTC			BN8014	Track Circuit	Lohman, MT	N
			<b>Loss of Shunt - Possible Rust or Foreign Material on Rail</b>						
			Extra 8014 East waiting behind absolute signal behind units 2267 (lead) & 2079 (trail). While light engines were proceeding through block, crew observed absolute signal go to Green and back to Red several times. Train crew reported improperly displayed signal (signal was CLEAR for only a few seconds), and dispatcher talked crew by signal. Data logs at location indicate that H recovered for several seconds several times. Track circuits were checked and all were found properly adjusted. Shunt tests were made throughout block and all OK. We assume that there was a loss of shunt on light engines proceeding through block at 50M.						

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			<b>Cause</b>						
			<b>Narrative</b>						
<b>59</b>	3/15/1996	BNSF	CTC			Train 05 014Y 14th	Signal 320.0	Saco, MT	N
			<b>Phantom Signal - Due to Sun Angle</b>						
			<p>Train 05 014 14th was eastbound observed Flashing Yellow at signal 322.6. While approaching signal 320.0, he observed a yellow signal. Approximately five to ten cars from signal, signal appeared to be Green. They reduced speed, came up to control point and observed Red over Lunar. Train stopped on switch and notified dispatcher. System was tested and operated as intended. Bulb voltage was at eight volts. Due to time of day and low bulb voltage, it is believed sunlight reflected in green head and washed out weak Yellow signal. We observed signal at same time of day and believe a train crew would have to use their imagination to believe they saw a true Green signal. Phan kill was added to signal to cut down possibility of mistaking the Green aspect.</p>						
<b>60</b>	3/31/1996	BNSF	CTC			106 of the 30th	Bare Copper Wire Bridging HD and DD	Between Radnor and Brimstone	N
			<b>Vandalism - Pole Line</b>						
			<p>Train 106-30 reported signal 1248.2 Green with signal 1246.4 Yellow and West Radnor Red over Lunar. Signal 1248.2 should have been Flashing Yellow. Vandals had been cutting copper communications wire down which become wrapped in the signal wires between 1248.2 and 1246.4 causing the signal at 1248.2 to be Green instead of Flashing Yellow. Distances between signals are as follows: 1248.2 to 1246.4 8850 feet; 1246.4 to West Radnor 11000 ft and West Radnor to East Radnor 1000 ft. on a 0.2 descending grade. This signal spacing provides adequate braking distance. All lose copper either cut down or tied up to clear signal wires.</p>						
<b>61</b>	4/3/1996	BNSF	CTC			None	Track Circuits	Bristol, IL	N
			<b>Maintenance - Improper Adjustment, Track Circuit</b>						
			<p>Amtrak 1347-3 on the North Track west of Bristol, IL., lost shunt and allowed the westbound signal on the North Track at Bristol to momentarily clear. The dispatcher had entered a stack for this signal behind Amtrak. Shunt test were performed with no exceptions. No train was present near Bristol to observe the westbound signal at Bristol to momentarily clear. Adjustments to track circuits between Bristol and MP 48.7 were made to reduce the voltage on the track relays for better sensitivity.</p>						
<b>62</b>	5/17/1996	BNSF	CTC			113NN226-16	121 R Track	East Finch, MT	N
			<b>Human Error - Field Wiring Error, Inadequate Service Testing</b>						
			<p>At approximately 21:00 on 17 May 1996, train 113NN226-16 sitting on main line at East Finch with train 70TT006-16 east of him in the block between him and first intermediate signal east of Finch. Eastbound absolute signal went Red to Yellow and then to Green then back to Red.</p> <p>Investigation revealed track wires at Finch and RB cut were transposed. Maintainer had replaced track wires after Tie Gang approximately 2 hours prior to incident. Swapped track wires resulted in track relay not shunting with .06 ohm shunt. Track wires were rung out, and restored to proper configuration. System was tested and operating correctly at 06:00 on 18 May 1996.</p>						

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**Cause**  
Narrative

**63**    5/20/1996    BNSF    AB          177J68    Signal S238.2    Mt. Pleasant, IA MP 238.2    N

**Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)**

Train 177J68 following train 492 had a Red signal S238.2. Signal S238.2 then went to Yellow for a few seconds and then to Green. Investigation found the "D" control wire crossed on the pole line with "D" wire for the north track due to tree limbs blown into pole line by storm. Tree limbs were removed and circuits tested for proper operation.

**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.

**65**    5/30/1996    BNSF    CTC          Train #01-168-29 -    Aerial Cable Shorted    Ashland, NE    N

**Vandalism - Cable Damaged by Digging**

At approximately 21:21 hours train crew on eastward train #01-168-29 reported that the absolute signal on main track two West Ashland (2E signal) displayed an APPROACH MEDIUM aspect and that they could see that the next signal, absolute signal at Ashland Crossovers (2E signal) was dark. Signal maintenance personnel investigated and determined that two wires in the aerial cable was shorted between West Ashland and Ashland. The two circuits shorted together were the 40LA-42LB RYGP and the 38 RAFY.

The sequence of events were as follows:

Train 01-168-29 was sitting west of absolute signal 2E at West Ashland. The dispatcher requested the 2E signal which did not line. This signal should have displayed an APPROACH aspect since Ashland had not yet been lined, however, with the 38 RAFY energized it caused the signal to display an APPROACH MEDIUM aspect. The 38 RAFY being energized also caused the Red repeater at Ashland to de-energize. Since the dispatcher had not requested the 2E signal at Ashland the Harmon Logic Controller (HLC) de-energized the red bulb voltage. Maintenance personnel megged cable and used spare wires to replace damaged wires. Operational checks performed with system working as intended.

Inspection of the cable did not reveal how or why these wires had become shorted. The cable in this area was then replaced. After new cable was in service a closer examination of old cable revealed that the cable had been partially cut. This damage had been caused by outside contractor who had been removing open line wires. The contractor pulled line wires over cable which cut through insulation and into wires.

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			<b>Narrative</b>							
66	6/10/1996	BNSF	CTC			9593W	None	Northport, NE	N	
			<b>Phantom Signal - Due to Unpainted Signal Hood or Background</b>							
			At 12:58 MDT on June 10, 1996, Engineer operating the 9593 West (Train 131RC211) reported a Red over Yellow aspect at Northport and while approaching West Northport a "high green" was observed at West Northport, while the 9524 East was lined through the West Northport location. Interview with crew of the 9593 revealed that as they approached West Northport, 775 feet from the 1 WA signal, it appeared Green. At 462 feet from the 1 WA signal it was observed Red over Red, and they stopped their train 268 feet from the 1 WA signal. CTC data log and local data in memory at field site indicate 1 WA signal was not requested at West Northport. All signal equipment at West Northport tested. Interlocking tests performed with no exceptions. On June 11, 1996 at 12:58 MDT the area was observed in the same sun light conditions. From the point where the crew alleged a high green, our observation revealed a light colored area on the background of the 1 WA signal. This was caused by bird excrement. The area in question was painted with flat black paint, lenses cleaned, and lamp voltages set at 9.2 volts to improve visibility of signal. It is our opinion, this is not a false proceed incident. This report is being filed as information only. See diagram attached.							
67	6/21/1996	BNSF	CTC			CFWSX 320 Engine	FR-2	W.E. Landes, TX	N	
			<b>Failed Equipment or Device - FR-2</b>							
			The CFWSX entered the east end of the siding at Landes on a DIVERGING CLEAR aspect traveling westbound. The next signal encountered at the west end of Landes was dark. The signal was dark due to a bad order FR-2. The FR-2 wouldn't light the signal but allowed enough current flow to keep the light check relay energized. A new FR-2 was installed, tested and left working OK.							
68	6/26/1996	BNSF	CTC			491-26	None	Galesburg, IL	N	
			<b>Human Error - Field Wiring Error, Inadequate Service Testing</b>							
			Train 491 reported having a Red over Green on the 2WCD signal at Graham and a Red signal at CP 1699. Testing revealed that incorrect wiring changes were made causing the problem. Corrections were made to the wiring and signals tested for proper operation.							
69	8/4/1996	BNSF	CTC			None	PSO	Essex, MT	N	
			<b>Failed Equipment or Device - Insulated Joint(s)</b>							
			Maintainer called account Red blocks. Upon arrival found signals CLEAR. Investigation found that slide fence would not set signals Red. Signals were set to STOP until cause could be determined. It was found that there was a shorted insulated joint at Signal 1158, and enough signal was conducting through ground to allow another PSO for a dragging equipment detector to pick the slide fence receiver PSO at shed 4D (both 211 Hz). Changed frequencies of dragger and slide fence to 4000 Hz and 645 Hz respectively, and insulated joint was also replaced. System tested and operating as intended.							

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			<b>Narrative</b>							
<b>73</b>	8/24/1996	BNSF	CTC			None Involved	PSO Receiver	Signal MP 48.6 near Silvana, WA	N	
			<b>Human Error - Improper Frequency Selection for Replaced Component</b>							
			Signal employees while performing signal test discovered that with switch at MP 49.8 in the open position the signal governing movement over the switch at MP 48.6 didn't display STOP indication. Further investigation revealed that a PSO transmitter located 12,200' to the south was being coupled around the insulated joints by tunable joint couplers causing the receiver to remain energized. The PSO transmitter is the same frequency as the PSO used for the NWP circuit. The switch at MP 49.8 was at the time spiked and clamped out of service due to the switch frog having been removed on August 28, 1996. On May 8th the signal maintainer had been called for a Red signal at the signal governing movement over this switch and found a broken wire on the PSO transmitter used for the NWP circuit. The frequency of the PSO located south of the signal was changed to 1430 Hz. ROOT CAUSE - The frequency of the PSO located 12,000' to the south had been changed 5 years ago from the original 1430 Hz to a 970 Hz due to an equipment failure. When the original equipment was repaired it was not reinstalled. With the dry conditions the PSO was coupled around the insulated joints causing the receiver to be energized. Under most conditions this was not happening as is demonstrated by the signal trouble in May of this year and the testing that was performed when the 970 Hz PSO was installed for the NWP circuit in March of '96.							
<b>70</b>	9/3/1996	BNSF	CTC			Q-CVLI1-02 Eng. 8	EC-4, 213A Module	Avard, OK	N	
			<b>Failed Equipment or Device - Electrocode Module</b>							
			At approximately 0720 hours on 9-3-96, train Q-CVLI1-02, engine 8534, traveling eastbound on the North track of the Panhandle Subdivision of the Oklahoma Division between Avard and Waynoka, Oklahoma observed intermediate CL signal 3382 pumping from Dark over Dark to Yellow over Yellow with a train in the block ahead. Supervisor of Signals and Signal Maintainer were called to investigate.							
			The investigation revealed that the condition existed as follows, the signal would display a Yellow over Yellow aspect for 2 seconds then display a Dark over Dark for 40 seconds then repeat. Further investigation revealed a Bad Order Electrocode-4, 213A, Lamp Driver Module and a burst signal bulb in the Top Green position. Suspect a lightning strike close to the signal account heavy storms in the area.							
			The 213A module and bulb were replaced and a complete operational test performed. The system was left operating as intended.							
<b>71</b>	9/12/1996	BNSF	AB	Remote		UP 01XSEAP	Shunt Wires	Vancouver, WA	N	
			<b>Maintenance - Switch Shunt Wires Broken</b>							
			Section crew replaced reverse switch point and stock rail on hand throw switch at MP 136.3 and cut shunt wires from the switch circuit controller to the rail. Switch was equipped with a shunt type circuit and is in ABS territory. The signal maintainer failed to properly check shunt box and the wires that were cut were not replaced. The UP 01XSEAP was lined from Main 2 to Main 1 at Vancouver interlocking and received a Red over Yellow signal with the hand throw switch at MP 136.3 in the reverse position. The signals should have been all Red. The UP 01XSEAP ran through the hand throw switch.							
			Formal investigation on the Signal Maintainer is scheduled for September 27, 1996.							

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			<b>Narrative</b>							
72	9/26/1996	BNSF	CTC			Westbound BN Trai	Intermediate Signal 244.6 (A Head)	Springfield, MO	N	
			<b>Failed Equipment or Device - Interior Wiring</b>							
			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.							
74	10/2/1996	BNSF	CTC			1260	Insulated Joints and Lightning Arrestors	Hinsdale, IL	N	
			<b>Failed Equipment or Device - Insulated Joint(s)</b>							
			Signal employee observed signal 318.8 display a CLEAR aspect with train 1260 in block. Supervisor and Maintainers found an insulated joint shorted and two gas lightning arrestors shorted allowing enough current to pick up the track relay with shunt on track. Replaced defective insulated joint and lightning arrestors.							
75	11/16/1996	BNSF	CTC			Suburban 1268	Lightning Arrestors	Westmont, IL	N	
			<b>Failed Equipment or Device - Lightning Arrestors, Shorted</b>							
			Suburban train 1268 reported signal 319.6 went from Red, to Yellow, to Green and then back to Red while train 1294 was east of the signal. Signal Supervisor found shorted lightning arrestors on Track Isolation Units. While the last set of trucks in train 1294 were in the stagger of the insulated joints and with the two shorted lightning arrestors, the insulated joints were in effect bypassed. This allowed the track relay on the east side of the insulated joints to be energized by the track battery on the west side of the joints until the last set of trucks were east of the effective insulated joint, at which time the track relay was again de-energized. This allowed the signal to momentarily go to Yellow, Green and then back to Red. The defective lightning arrestors were removed and the circuits tested for proper operation.							

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			<b>Narrative</b>							
76	11/22/1996	BNSF	CTC			None	SB ABS Sig B Yard Switch	Vancouver, WA	N	
			<b>Insufficient Information in Report to Assign Cause</b>							
			SB Absolute signal at B Yard Switch displayed a Yellow over Yellow when Vancouver interlocker displayed a Red/Red/Lunar. The double yellow at B Yard Switch is used to tell train crews they are taking one of many diverging routes at Vancouver interlocking. All speeds through the diverging routes are 10MPH. The lunar signal at Vancouver checks a 1800 foot OS track before the train gets to the yard. On a temporary basis, the lower yellow at B Yard Switch has been replaced with a lunar lens.							
			No train reported this problem. The Yellow over Yellow was engineered and cutover for this route due to the 10 MPH speed. I personally don't like the Yellow over Yellow but question whether this is a false clear. Plan to talk more with FRA on this issue.							
77	12/2/1996	BNSF		Remote			Searchlight Signal 808EE	University Ave., Minneapolis, MN	N	
			<b>Human Error - Field Wiring Error, Inadequate Service Testing</b>							
			Searchlight signal 808EE (eastbound signal on South Receiver Track) reported Flashing Red by eastbound train CN-368 on main track 1. Eastbound main track 1 searchlight signal 808EB displaying DIVERGING APPROACH MEDIUM (Red over Flashing Yellow). Lighting circuit for 808EE signal was in parallel with lighting circuit for 808EB causing 808EE signal to flash whenever 808EB signal displayed DIVERGING APPROACH MEDIUM. This aspect was added on 11-11-96 when CTC was installed on the St. Paul Subdivision. Wiring changes were made to the lighting circuit for 808EE signal eliminating this parallel circuit. Signal forces were notified at 0400 hrs, with wiring changes and testing completed at 0630 hrs.							
78	12/15/1996	BNSF	CTC			94-650-15	Signal 92R	South Ada, OK	N	
			<b>Failed Equipment or Device - Relay</b>							
			At approximately 0340 hours on 12/15/96, train 94-650-15 reported absolute signal 92R, northbound home signal, South Ada, OK displayed a Green aspect with train 50-JJ005-13 still occupying the block between South and North Ada.							
			Signal Maintainer found 92RHDR in the energized position with no voltage applied to the coils. Relay was replaced, operating tests performed, and system operated as intended. 92RHDR will be sent to the Springfield Signal shop for further testing.							

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79	12/16/1996	BNSF	CTC			SLBCH3-12 Engine	Underground Cable	La Lande, NM	N
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**Human Error - Field Wiring Error, Inadequate Service Testing**

Train SLBCH3-12 proceeding eastbound on the main track approaching the east end of La Lande noticed a Green aspect displayed on the main track signal and a Yellow aspect displayed on the leave siding signal. Since the switch was normal the proper aspect for the siding signal should have been Red. Investigation revealed that a signal gang was splicing through underground cable to get ready for a track expansion project and had inadvertently spliced RARN to RBN and RBR to RARN. This put both signal mechanisms in series allowing the voltage for the mainline signal mechanism to also display the Yellow aspect on the siding signal.

Procedures were reviewed with all signal personnel involved. Remedial action is as follows: additional formal training for Signaller and Foreman involved, additional test equipment will be provided to this signal gang, discipline was assessed to Signaller involved requiring retraining before returning to work.

109	1/9/1997	BNSF	CTC			Helper Engine BN 5	Design of EOR Circuit	Near Firth, NE	N
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**Human Error - Signal Circuit Design Error, Inadequate Service-Testing**

At approximately 2115 hours, Thursday, January 9, 1997, train crew on the helper engine reported that they were sitting on the rear of eastward coal train #03HH98-08, on main track two, east of intermediate (241.9). They reported observing an APPROACH MEDIUM aspect on westward intermediate signal (141.9), on main track one. They believed this signal should have been an APPROACH aspect. There were three trains involved in this incident, the third train was engines from a grain train #01GLIMA-06, which had also assisted in pushing coal train over hill. At the time that the alleged improper aspect was observed the grain train engines were headed west, occupying the track west of intermediate signal 241.9. Dispatcher had lined grain train engines westward at West Firth from main track two to main track. At this time the eastward signal from main track one to main track at East Firth was also lined. (Diagram attached)

This report was confirmed. With the scenario as described the 141.9 signal would display an APPROACH MEDIUM aspect when it in fact should have displayed an APPROACH aspect. However, the signal system functioning as designed. A design change was made to ensure this would not be observed again.

Although this condition could be observed from adjacent track, if main track one was occupied or a signal lined through the block this condition would not exist. Basically, no train could accept this signal could observe this condition.

This report being filed for information purposes only.

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<b>108</b>	1/16/1997	BNSF	CTC			Q-BHSH1-15	FR-2 Module	E.E.Clearcreek, TX	N
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**Failed Equipment or Device - FR-2**

Westbound train Q-BHSH1-15, Eng 7068, reported APPROACH signal 4611 displaying a Flashing Yellow aspect and WB control signal at the east end of Clearcreek, MP-448.9 of the Panhandle Subdivision, Oklahoma Division, displaying a Red over Dark aspect with the signal cleared into the siding over a reverse switch.

The incident was investigated by Supervisor of Signals, Signal Inspector. And Signal Maintainer. The reported condition was reproduced by making the same lineup, subsequent investigation revealed that the Electro Pneumatic Corporation (Harmon) FR-2, Revision "B," current regulated solid state flasher, was outputting 500mA at 0.95 VDC to the LB lamp which was enough current to energize the LBCR, a DN-22L, 0.8 ohm light check relay, but not enough to produce a visible light aspect.

The FR-2 Rev. "B" module was replaced with a FR-2 Rev. "C" module and the circuit tested for proper operation.

BNSF is in the process of upgrading all FR-2 modules to Revision "C."

<b>110</b>	2/3/1997	BNSF	CTC			Z-KCTP2-28 Eng Li	None	Argentine, KS	N
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**Human Error - Field Wiring Error, Inadequate Service Testing**

At 06:45 hours on Feb 3, 1997 Lite Eng 636 passed signal 2W, at CP-143, Middle Track, MP-5.5 of the Emporia Sub., Kansas Division displaying CLEAR, Green over Red. The next signal, 4W at CP-142, MP-5.8 was observed to be at Stop or Red. After stopping short of the red 4W signal the crew reported to the Kansas City dispatcher in the Soc at Schaumberg, IL.

The incident was investigated by Gen. Supvr. Const. and Supvr. Signals. The condition was found to exist as described by the train crew. Further investigation revealed that the 4WHDP relay was energized at CP-142 when Signal 4W was at STOP causing signal 2W at CP-143 to display CLEAR. The 4WHDP relay was energized from the new wiring that was done for future track changes. No. 1 front and heel of the 4WCR had an existing circuit, 4WHDP wired in and working. An additional circuit 4WALOR was crimped into the same flag terminals (US&S plug-in relays) with No. 1 front connected to 4WGB battery buss. This connection to the battery buss was the source to energize the 4WHDP relay.

The wiring was corrected and the system checked out and left operating as intended. There is a formal investigation of this matter pending.

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

**111**    2/24/1997    BNSF    AB          SP 8027 Eng, ICXCI    Signal 1617    Crowley, LA    N

**Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)**

Upon arrival found approach signal 1617 was Green with train on mainline between switches at Crowley and east spring switch reverse for siding. Head in signal 1639 was Red with signal 1617 Green. All signals involved placed to STOP. Inspection revealed trees had fallen through the pole line and had several wires wrapped together causing signal 1617 to be false cleared with foreign battery. Trees were then cleared, pole line repaired, signals put back on line and all tested OK.

**112**    4/4/1997    BNSF    CTC          C-TPRR1-04 Engin    None    Augusta, Kansas    N

**Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)**

On April 4, 1997, at approximately 1510 hours, UP coal train C-TPRR1-04, UP engine 9552, was traveling westbound on the north track of the Emporia Subdivision, Kansas Division, approaching the east end of Augusta Siding MP-183.21 when they reported the 2R signal pumping from Yellow to Flashing Yellow and back to Yellow with the next signal at CP-1853 Red to the Soc in Schaumburg, Illinois. The weather was windy, cold and raining.

The train was advised to stop short of the signal. Signal 2R was taken down and the crew advised to wait for the arrival of Supervisor Signals. Interviewed the crew and advised the dispatcher that they could flag signal 2R. This route was taken out of service until testing could be performed.

The incident was investigated by Supervisor Signals and Signal Maintainers. Signal 2R at the east end of Augusta was requested and displayed a Flashing Yellow aspect with the next signal at CP-1853 Red. Further investigation revealed that the NWMR relay at the east end of Augusta was energized with the 2RAHDP relay at CP-1853 de-energized. This allowed signal 2R to display a Flashing Yellow.

The battery end of the NWMR circuit was opened at CP-1853 and there was still approximately 10 volts DC on the circuit from an external source. The poleline was walked and a line wrap was discovered between the number 5, top arm, track side position and the number 5, bottom arm, track side position with the number 4, top arm wire laying against the number 4, bottom arm wire at approximately MP-184.64. The top arm 4 and 5 track side circuit is NSWXRN and NSWXR respectively. The bottom arm 4 and 5 is NWNRN and NWMR respectively. The NSWXR circuit is a 10 volt DC wrap for the Custer Lane crossing at MP-184.64 that is normally energized. The wires were sagging account of an imbalance on the east side of the double arm which allowed the track side west to become slack.

The wrap was removed, an arm guy installed and the slack taken out of the wires. All energy was removed from the NWMR circuit and the signal 2R now displayed a Yellow aspect. The signal was tested including cross and grounds and returned to service at approximately 1930 hours. The NWMR and NSWXR circuits were staggered to prevent a similar occurrence in the future.

Report #	Date	Reporting Carrier	Block System	Interlocking System	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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114	4/15/1997	BNSF	CTC			UP-		North Portland Jct., Oregon	N
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**Human Error - Field Wiring Error, Inadequate Service Testing**

At 12:30 IB 4/14/97, the signal crew cut several cables with the backhoe. It was determined that just one of the cables was being used, and the rest were abandoned. After the cable was spliced together, it was decided that since the cable from the U.P. signal to the case and the cable from the U.P. case to the BN case had not been disturbed, only the circuits between the BN case and the BN tower were tested.

On 4/15 at 02:45, I was called back because the U.P. was investigating a false proceed. They said their Yellow repeater was being held up with 4 volts on the coil, and sending a Green back to their approach when the absolute signal at North Portland Jct. was Red. It was determined that the cable supplying N-10 to the U.P. case was not repaired. With this missing, and because the case battery negative, and the tower battery negative were tied together in the U.P. case, the B-10 connected to the UP-H relay found its way back to N-10 through the Yellow repeater in the U.P. case picking this relay, and causing a false proceed on the U.P. approach signal. The negative batteries were tied together by the U.P. in their case, but this was not shown on our print or theirs.

The N-10 cable was repaired, and the negative batteries were separated in the case eliminating the possibility of a single fault in the N-10 allowing a track relay to pick up through the common negative.

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.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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115	6/14/1997	BNSF	CTC			Train S-CHR11-14, E	None	Argentine, Kansas	N
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**Human Error - Field Wiring Error, Inadequate Service Testing**

Train S-CHR11-14, traveling westbound on the south main track of the Emporia Subdivision of the Kansas Division at MP-3.5, CP-148, 12st St., at approximately 14:43 hours on June 14, 1997, reported signal 4W displaying a Red over Flashing Yellow, signal 4W at MP-3.9, CP-147, AY Tower, was displaying a Red over Red while signal 4W at MP-4.0, CP-145, 18th St., was displaying a Red over Flashing Yellow with a route over No. 1 crossover reverse to the middle main.

The incident was investigated by Mgr Sig, Sup Sig, Gen Sup Sig Const, and Sig Mntr. The lineup was recreated and revealed that the 4W signal at CP-148 was displaying a Flashing Yellow over Red with 4W at CP-147 displaying a Red over Red with 4W at CP-145 displaying a Red over Flashing Yellow with a route over No. 1 crossover reverse to the middle main.

Further investigation revealed that the SWADGR relat at CP-147 was energized with the 4W signal at STOP. When the SWADGR relay is energized it in turn energizes the SMR circuit between CP-147 and CP-148 and allows the 4W signal to display a Flashing Yellow over Red.

The SWADGR relay should not have been energized unless the 4WAHDP was energized at CP-147. The front heel combination in the 4WAHDP relay of the SWADGR circuit was inadvertently removed during a cutover on 6/12/97 and the subsequent testing did not reveal the defect.

The SWADGR circuit was rewired to correct the defect and the route tested and returned to service at approximately 22:00 hours on 6-14-97.

116	7/9/1997	BNSF	CTC			LWAS861	Wiring Error	East Columbia River, WA	N
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**Human Error - Field Wiring Error, Inadequate Service Testing**

Signal Technician and a Signalman were testing new VHLC equipment at East Columbia River control point in preparation for signal cutover. During the testing the flex wires for the westbound signal lower head were opened and when closed the WBRE wire was placed on the terminal for WBLE which resulted in the Lunar aspect being displayed when the signal should have been Red.

Signal wires restored to proper position and complete signal aspect checkout was conducted with no other exceptions noted. Formal Investigation schedules on both individuals involved.

Report #	Date	Reporting Carrier	Block System	Interlocking System	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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117	8/6/1997	BNSF	AB			SSW8089 East	Signal 1660	Crowley, LA	N
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**Cause**  
**Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)**

Narrative  
 Train 7290 west was in the siding at Crowley with train 7952 west pulling into the siding behind the 7290 west to meet east bound train SSW 8089. The 7952 west was too long and several cars were hanging out on the main line at the east end of the siding. Train SSW 8089 reported that when he approached and passed signal 1660 at the west end of the siding the signal 1660 was Green and when he arrived at east end signal 1639 was Red. Signal Supervisor was called and placed the signals to STOP until all trains had departed. When reenactment was done signal 1660 assumed the correct Yellow aspect. All circuits and relays were tested with no exceptions poleline was walked and line wrap was observed at mile post 164.2 account trees in the line. The wrap was between BL10 and WPC control wire, which is the pole changer from Yellow to Green at signal 1660. Even though circuit wasn't failing at time of inspection when wires were pressed together signal 1660 did change to the Green position. This failure was reproduced for the local trainmaster and we think the line wrap was the cause of the reported false proceed. The line wrap, trees, brush and BL10 were removed and all signals restored and tested OK. We will install Electrocode in this area immediately to preclude this from happening again.

The SSW 8089 had authority in the Midland Block and was not authorized in the Crowley block. The SSW 8089 had to stop at the east end of Crowley due to no authority in the block and therefore there was no chance of a collision.

118	9/11/1997	BNSF		Automatic		E-MEACDM023	None	Shattuc, IL	N
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**Scenario Reenacted, Unable to Duplicate, No Defects Found**

Train E-MEACDM023 reported that the approach signal to the Shattuc Automatic Interlocker was Green and that the absolute signal at the Shattuc Interlocker was Red and a CSX train was occupying the interlocker. E-MEACDM023 was traveling eastbound and got by the absolute signal. Signal Dept. forces from both the BNSF and CSX responded to conduct signal tests, review the information from the event recorder and simulate the event with track shunts. All tests reproduce the event with the timing shown on the event recorder were negative, and tests for cross and grounds, relay values, approach locking and inspection of signals and equipment showed no defects. The interlocker is maintained by the CSX and the BNSF approach signal and track circuits are maintained by BNSF.

Report #	Date	Reporting Carrier	Block System	Interlocking System	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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121	9/12/1997	BNSF	CTC			UP LNJ5812	Alleged 2R Signal	Eton, MO	N
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**Cause**

**Narrative**

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.

119	9/14/1997	BNSF	CTC			CP Transfer	5 E Signal	Minneapolis, MN	N
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**Human Error - Signal Circuit Design Error, Inadequate Service-Testing**

At approximately 1945 on 09-14-97 a CP Transfer crew reported a Red over F/Y 5E signal at University Ave Intr. Thru a 12 MPH turnout (#10 switch) into Shorem Yard. Upon investigation the maintainer found 5E to be Red over F/Red until the 1E signal coming out of Shorem Yard was cleared. Further investigation revealed that 5E would come up to Red over Green with no train on the approach to 1E. Cause was found to be that the #10 switch correspondence was not programmed into the VHLC control system for the B head Green, F/Y, and Yellow aspects. Green and Yellow aspects were disabled until corrective action was completed on 09-16-1997. Corrective action entailed adding external correspondence relays for the #10 and #1 switches, so that the 5E signal displays no better than Red over F/Red with the #10 switch in the reverse position.

120	9/26/1997	BNSF	AB			SF3680	Signal 1401	Elks DTC Bolck near Lafayette, LA	N
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**Vandalism - Pole Line**

Train P-NWOCLO1-26/engine SF3680 reported signal 1401 Green with next signal 1415 Red with no other trains in vicinity. Upon arrival Signal Supervisor and Signal Maintainer observed the above condition and placed 1401 signal to STOP. Further investigation revealed signal 1415 was Red due to a failed rectifier which shorted down the signal batteries at 1415 signal. Signal 1401 was Green account line wire 01G was wrapped with the 15PCR line wire which falsely held 1401 Green. The line wrap was caused by a dozer working under our poleline near mile post 140.05. The dozer had hit one of our poles and caused a hard wrap. There wasn't any trees or brush in this area and the dozer apparently belongs to a farmer doing work in the field next to the BNSF property. After line wrap was removed and rectifier replaced, signal 1401 was restored to service, all circuits tested and ok for service. Electrocode will be installed in this area to retire the poleline circuits.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
			<b>Cause</b>						
			<b>Narrative</b>						
122	10/1/1997	BNSF	CTC				3E Signal - Searchlight Mech	Mississippi St. Control Point, St. Paul, MN	N
			<b>Vandalism - Signal Damaged, Caused Unintended Signal Aspect</b>						
			On Oct 1, 1997 at 1643 CST, vandals shot out both signal heads on the eastbound controlled signal on the eastward track (Main 2) at Mississippi Street on the Minnesota Division, St. Paul Subdivision, causing 3E signal to display the aspect Dark/White Light. Both A and B head searchlight mechanisms were replaced and testing completed at 0300hrs CST Oct 2, 1997.						
123	10/8/1997	BNSF	CTC			UINBROO108	None	Towal, WA	N
			<b>Scenario Reenacted, Unable to Duplicate, No Defects Found</b>						
			Signal Supervisor was notified by SCC, approximately 1415 10-08-97, that a train had passed a Red absolute signal at West Towal. After talking to NOC, Supervisor it was determined that at West Towal the replay showed no signal had been requested, no EB signal was cleared, switch was reversed, WBK was on, and OS circuit was occupied. While Signal Supervisor was in route to West Towal, Trainmaster interviewed the train crew and reported the approach signal 121.2 displayed an APPROACH, then when they were about five to six cars from the signal the signal displayed APPROACH MEDIUM. On approach to West Towal the signal displayed STOP and the train crew could not stop their train before passing the signal displaying STOP. The engine stopped approximately 15 feet past the signal. The train crew reported the approach signal was properly aligned and had a bright aspect. The day was overcast with intermittent rain showers, All tests and inspections were made at both West Towal and at the signal 121.2 with no exceptions taken to any equipment. Signal aspect observed at approx. same time of day and no exceptions taken. An event recorder has been installed at signal 121.2 and will be monitored.						
124	10/9/1997	BNSF	CTC			STACBPA109	None	Wishram, WA	N
			<b>Scenario Reenacted, Unable to Duplicate, No Defects Found</b>						
			On Friday 10/10/97, at 16:00 Pacific time, Signal Supervisor was informed by the Superintendent that there was an alleged false proceed at Wishram Center at around 22:00 Thursday night, 10/9/97. A train crew near Maryhill claimed they overheard a conversation between the dispatcher and STACBPA109 train crew about going by a CLEAR signal at Wishram Center into a Red signal at Wishram East. The CTC logs were pulled, and it was determined that they did have a signal at Wishram Center, but the aspect cannot be determined by the logs. At that time, East Wishram had not been lined yet.						
			Signal Supervisor and Signal Inspector tested both Wishram Center and Wishram East and could not duplicate the reported problem and took no exception to the operation of the signal system at these locations. The train crew was interviewed by the Superintendent in Vancouver when they returned Friday night, and they verified what the other train crew reported.						
			Signal Supervisor talked to Engineer on 10/15. He thought the dispatcher lined the signal, then took it away putting the plant in time. According to the CTC logs, this did happen earlier, but it was long before they would have seen it at Wishram Center. The engineer advised he called the dispatcher immediately to report the incident and was told by the dispatcher to continue on.						

Report #	Date	Reporting Carrier	Block System	Interlocking System	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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**125** 10/14/1997 BNSF Remote Train ID # CJRKCN Phantom Signal Lincoln, NE N

**Cause**  
**Narrative**

**Phantom Signal - Due to Unpainted Signal Hood or Background**

Train crew reported to the Carling Tower Operator that they had a Red over Lunar aspect on the 2E Signal on the South Wye at Hall Tower Interlocking plant. The train stopped prior to passing the signal and questioned the Carling Operator since he had not seen this aspect on this particular signal before. The Operator had not lined the signal. Signal personnel determined that the 2E signal was not equipped with a lunar lens. It was determined that what they saw was the sun reflecting off the snow shield on the bottom head. This signal is located on a curve and next to an overpass which was casting a shadow on a portion of the signal. Signal personnel did observe the reflection that was reported by the train crew which was a very bright white light approximately 3 to 4 inches in diameter. The signal was re-adjusted for better visibility and individual hoods for each aspect were installed, replacing the snow hood which is a continuous hood shielding all aspects. This is a new Safetran signal which includes new back grounds and hoods.

**126** 10/16/1997 BNSF CTC BN 9507 None Bridgeport, Nebraska N

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

Approximately 0805 MDT BN 9507 east, train symbol EMLTBTM236 with 0 loads 116 empties 3147 tons 6380 feet, stopped in approach to EA signal at East Bridgeport on Main Track observed EA signal display Green for approximately 4 seconds then Yellow for 2 seconds then went Red. Helpers BN 9212 east a two unit 12 axle consist was cleared out of the siding at East Bridgeport and was at intermediate signal 35.8 at the same time BN 9507 observed the EA signal telegraph. BN 9507 east did not take the EA signal. Supervisor Signal was notified at 0824 MDT and advised Alliance South dispatcher to put signals to STOP. Maintainer notified st stay at depot Bridgeport until Supervisor's arrival. Field data logs and Ft. Worth Network office logs show 1WT track picking up and the 1ET track deenergized at the same time at intermediate signal 35.8. 1WT track is an end fed dc track circuit with a biased 2 ohm relay. 1ET track is Electrocode II. Reenactment was performed using a two unit 12 axle consist and the problem could not be duplicated. Tests were performed at intermediate signal 35.8 using 0.06 ohm shunts which showed Electrocode II 1ET track circuit deenergized approximately 5 seconds after a 0.06 ohm shunt was placed on circuit at signal 35.8. It was calculated that the 12-axle consist traveling approximately 30 mph would cause the 1WT to energize before the 1ET track deenergized, which would allow the 1EHR and the 1EDR at East Bridgeport to energize causing signal to momentarily display green then yellow and back to red when 1ET track deenergized. Office logs confirm EA signal at East Bridgeport displayed aspect cleared for 5 seconds. HXP-3R2 data logs from Hwy 26 show BN 9212 east passed intermediate signal 35.8 at 28mph.

Corrective action taken - installed 8 second loss of shunt time on 1WT track circuit to compensate for the 5 second delayed deenergization on the Electrocode II - 1ET track circuit. Operational tests performed on signal system with no other exceptions taken.

**127** 10/25/1997 BNSF CTC VKCKPHX123, Eng 2W Signal Canyon Diablo, AZ N

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

Westbound train VKCKPHX123 reported a Red over Flashing Yellow aspect into the controlled siding at East Canyon Diablo. This siding was changed to a non-signal siding to facilitate installation of non-signalized split point derails. All route displaying RESTRICTING aspects into the siding except the westbound route from the north track which was reported by the VKCKPHX123. Circuit plans were revised and the 2W signal now displays a RESTRICTING aspect when lined into the siding.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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128	11/22/1997	BNSF		Manual		SPOALB		Loc. CP 143, Pasco, WA	N
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**Human Error - Signal, Improper Lenses Installed**

Signal Supervisor was notified by Division Trainmaster on Nov. 24 that a train reported passing a signal displaying an ADVANCE APPROACH (Rule 9.1.5) at CP 143 and the next signal was RESTRICTING (Rule 9.1.13) at CP Grapevine. The message said CP 143 was Yellow over Green and CP Grapevine was Lunar under. After Trainmaster spoke with the Engineer, he reported the train was on Main One and at CP 143 the signal aspect west bound was Yellow over Green, at CP Grapevine the route was Main One to the Grapevine Lead with a Red over Lunar. The Engineer reported he knew the route he was lined for and recognized the aspect displayed at CP 143 was incorrect and handled his train accordingly. Rule 9.1.5 ADVANCE APPROACH was NOT listed as an applicable signal for Main One West Bound in the General Order putting CP 143 in service.

Upon investigation it was found the 1WB signal at CP 143 had Green, Green, and Red lens installed, when it should have been Lunar, Lunar, Red lens. The correct lens were installed and testing completed at 1400 24 Nov 1997.

129	12/17/1997	BNSF	CTC			EMD 9068	None	Crawford, Nebraska	N
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**Human Error - Signal Personnel Introduced False Energy into Signal System During Testing**

Approximately 1545 MST EMD 9068 with 115 loads 0 empties, 15600 tons, 6700 feet long, train symbol CBKMSLC459, was eastbound Main Track 2 and had a Green/Red at Control Point Crossover 437.5, Flashing Yellow/Red at intermediate signal 2-427.2 and red/red at control point Crossover 425.5. Engineer made normal train stop in approach of Red/Red at Crossover 425.5 and was advised by Signal Inspector and Signal Electronic Technician that they were troubleshooting a signal problem and that they had caused intermediate signal 2-427.2 to display Flashing Yellow/Red. Crew notified dispatcher, and Signal Supervisor was notified. Signal Supervisor obtained statements from Inspector and Electronic Technician. Inspector was testing for a cross by opening wires one at a time off of the C12 buss and had removed the C12 coil wire from the buss which fed the 2EAHGR relay. Removing the wire created a pickup path that passed through the coils of the 2EASPR, the 2EAHGR to the 2EAHGPR by way of a parallel coil wire connection and energized the 2EAHGPR causing the Electrocode unit to transmit a Flashing Yellow code 4 to signal 2-427.2.

Corrective action: Parallel coil wire connection between the 2EAHGR and 2EAHGPR was separated and the 2EAHGPR was made a repeater of the 2EAHGR. Signal system tested with no exceptions. Investigation scheduled to determine responsibilities of Inspector and Electronic Technician.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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179	1/1/1998	BNSF	CTC			BNSF9783, E-PAM	OS Track 5	Rosedale, KS	N
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Cause  
Narrative

Train E-PAMBAM-322, Engine BNSF 9783 was following the EB-FMFWKS-0130 at Rosedale, KS. The first train was lined into the siding toward the UPRR connection with the #5 switch reversed. The train disappeared from the signal system and CTC system onto dark territory. The switch was aligned normal and the 6L signal was cleared with a Yellow over Red for the second train. As the Engineer rounded the curve just south of Rosedale he saw the rear end of the first train fouling his track. He stopped his empty coal train short of the signal and called the dispatcher.

The Signal Supervisor and Maintainer arrived and observed the situation. The dispatcher was again contacted and asked for time to test before running the second train. The turnout of the 5 Track at the power switch #5 was tested and revealed the long fouling jumpers were both open and were ineffective. The 5 TR had .7 volts on the relay with the shunt down on the turnout.

The long fouling jumpers were replaced. The circuit was again tested and worked OK. The system was put back in service and left working as intended.

181	1/3/1998	BNSF	CTC			H-BARGAL1-03, E	2E Signal	West Baca, New Mexico	N
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Human Error - Improper Circuit Jumper in Place

At 2224 hours on January 3, 1998, train H-BARGAL-1-03 was stopped at the 2E signal at West Baca waiting for train ahead to clear the plant at East Baca. When the train ahead cleared the plant at East Baca, the 2E signal at West Baca displayed a Yellow over Green aspect. This signal should have been Yellow over Red.

Signal tests revealed that this could be duplicated. The problem was found to be an AAR washer had fallen down between two terminals on the back of the H-2 mechanism at East Baca. This washer bridged two terminals thereby falsely energizing the 2E signal at West Baca.

The washer was removed and signal system restored.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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<b>180</b>	1/12/1998	BNSF	AB			UP-INOLB1-11	Signal 1745	Midland, LA	N
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**Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)**

At approximately 10:30 AM a westbound crew on Union Pacific train INOLB1-11 near Midland, Louisiana reported they were at signal 1745 on the main track near the east side track switch with a Green signal which should be Red account an east bound train had left the west switch reversed after they previously cleared the main for a meet.

The train crew verified the switch was still lined for movement to the side track and reported to the dispatcher that signal 1745 was false cleared over the reversed switch. With that operations were suspended in the area and signal personnel notified.

Relief Signal Maintainer and Signal Inspector responded immediately to the call and interviewed the crew for pertinent information, with Signal Supervisor responding to help with the investigation and corrections as needed.

Investigation revealed a large willow tree had been blowing into the pole line during the storms that day causing the 55PC line wire to be hard wrapped with the 45G7 signal control wire spanning out the 1NWPR switch repeater contact thereby false clearing signal 1745.

The line wires were unwrapped, the trees and brush were cut, the pole line inspected for other possible wraps, signals tested and placed back in service with all ok.

<b>182</b>	2/2/1998	BNSF	CTC			LKAN677	Color Light Signal	Arcadia, KS	N
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**Human Error - Field Wiring Error, Inadequate Service Testing**

Dispatcher reported to Signal Operations Center, the LKAN677, a northbound local, was following the Q-MEMSSE1-2 at North Arcadia. When the local left North Arcadia they had a Yellow signal. At the first intermediate signal, 114.6, they saw it Red, then change to Green. The local crew thought the train they were following was not far enough ahead for them to have a Green at 114.6.

Signal Supervisors were called to investigate, joining them were Signal Inspector and Maintainer.

It was determined that the color light signal at 114.6 was wired so that if the Electrocode 4 was receiving a code 2, the signal would display a Green aspect and if the EC4 was receiving a code 4, the signal was also Green. It was found that the yellow lamp was missing a strap in the signal head. Without this strap the yellow lamp would never be lit. Also, in the case, the yellow and green wires were reversed. This caused the signal to be in a "light out condition" causing the EC4 to downgrade the signal to yellow. With the wires reversed the yellow energy was applied to the green lamp wire, so that the signal would display Green any time a yellow was called for by the EC4.

The strap was installed and the wiring was corrected. The signal was tested and checked OK. The system was left working as intended.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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183	2/10/1998	BNSF	CTC			BN9669E	Signal 142.8	Electra, TX	N
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**Human Error - Improper Equipment Installed**

Engineer on BN9669E reported that Signal 142.8 was Green in approach to a Red signal at Signal 138.8 at 10:01 PM. The trick dispatcher held trains until the related signals could be turned to their most restrictive aspect (Red). We released the trains from the area, so that testing could be initiated. Signal Supervisor, Signal Inspector, and Signal Maintainer began testing at approximately 1:15 AM. After testing the signal at 142.8 it was discovered that following some wiring changes made by two Signal Inspectors on 12/8/98; a polar adapter module had been left on an Electrocode 2 unit. The adapter would not allow the SA mechanism to pole change to a Yellow signal. After the module was removed the signal system was tested and all OK'd. The signal system was returned to service and the dispatcher at 1:45 AM. Formal investigation is scheduled.

184	5/4/1998	BNSF	CTC			CNW8820	None	Logan, WY	N
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**Human Error - Field Wiring Error, Inadequate Service Testing**

At approximately 2115MDT Signal Maintainer was notified of a switch out of correspondence and a track indication on main track 2 at crossovers 72.5. On inspection maintainer found 3B moveable point frog and 3A switch had been trailed through and sustained bent throw, lock and point detector rods on both switch layouts. Dispatcher was notified to stop train movements and Signal Supervisor and Signal Manager were notified. Vital Harmon Logic Controller logs were obtained and it was determined that at 21:05:23 MDT the C&NW 8820 coal train CANN0478 with 107 loads and 0 empties 14980 tons, had received a Red over Yellow DIVERGING APPROACH on the 1E signal over crossover main track 1 to main track 2 and had trailed through the 3B moveable point frog and 3A switch in the reverse position. Train crew was unaware they had trailed through the reversed frog and switch. Crossover at 72.5 had been reconfigured same day, with preliminary changes made to have the new crossover from main track 1 to main track 2 used in hand throw only, and the existing crossover from main track 1 to main track 2 was removed from service to allow reconfiguration for addition of third main track and final cutover on May 6. In an effort to expedite traffic during the track changes, Signal Supervisor used existing control and indication circuits from the retired crossover to control and indicate the new main 1 to main 2 crossover using the existing VHLC program. External Indication Locking tests were performed on all switches and moveable point frogs and all showed correct normal and reverse correspondence with the VHLC. Supervisor assumed that since no VHLC software had been changed that it was not necessary to check switch indications against clear signals over affected routes. As a result of moving control and indication circuits from the retired crossover east of 3 crossover to the new crossover west of 3 crossover neither the 1EBHGR or the 2WBHGR checked the 3 crossover switch correspondence. A 1EB signal was requested over main track 1 to main track 2 crossover and the 3 crossover reverse and the eastbound CNW 8820 proceeded on a APPROACH DIVERGING splitting the 3B moveable point frog and the 3A switch.

CORRECTIVE ACTION: 3B moveable point frog and 3A throw, lock, and point detector rods repaired, adjusted and tested switches for indication correspondence and returned to service at 0300 MDT May 5th. Main track 1 to main track 2 crossover removed from service until May 6th, when new VHLC program was installed and signal cutover performed.

Investigation scheduled with Signal Supervisor.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			<b>Cause</b>							
			<b>Narrative</b>							
<b>185</b>	7/27/1998	BNSF	AB			MDENGAL3 - Engin	Pole Line Wire	Ottumwa, Iowa	N	
			<b>Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)</b>							
			Train MDENGAL3-26 reported signal S277.8 Green and signal S275.6 Red as he was following an eastbound train. Signal Supervisor, Signal Inspector and Signal Maintainer placed shunts to simulate the train position and discovered that the "D" upgrade circuits for the north and south tracks were crossed. Further investigation revealed that a tree limb had fallen into the pole line at MP 277 causing a wrap in the north and south track "D" wires. The line wrap was removed and circuits tested again with no further exceptions taken.							
<b>186</b>	7/30/1998	BNSF	CTC			ZNBYWSP829	Switch CP 7816	Vaughn, New Mexico	N	
			<b>Human Error - Signal Personnel Introduced False Energy into Signal System During Testing</b>							
			Train Z-NBYWSP8-29 was eastbound on the south track between Vaughn and Joffre, New Mexico. The train observed a CLEAR aspect for intermediate signal 7814. After passing the intermediate signal, approximately 1100 feet, the train encountered a reverse switch at a new control point CP7816 that was not in service. The train crossed over from the south track to the north track. The train stopped approximately .6 mile after crossing over to the north track. The dispatcher did have an opposing train lined on the north track approaching this location. The two trains got stopped approximately eight (8) miles apart.							
			Cause: Signal personnel were pretesting the new crossover location preparing for in service testing scheduled for August 4, 1998. Switch clamps were removed from the switches anticipating a track window to test the switch operation. Track and time was denied by the dispatcher until one train ran. While waiting for track and time the signal personnel inadvertently threw the switch reverse while testing modules and looking for a ground on the operating battery.							
<b>187</b>	8/25/1998	BNSF	AB			SCLOLCB-524 We	Pole Line	Adamana, AZ	N	
			<b>Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)</b>							
			The SCLOLCB-524 west was approaching intermediate signal 2391 which was displaying a Flashing Yellow aspect. The VMCLAC-122 was in advance of signal 2391 approximately 1/2 mile occupying the block controlled by signal 2391. The SCLOLCB-524 was able to stop without incident.							
			The cause of the failure was due to trees in the pole line crossed the PCR circuit with the HDR circuit falsely energizing the circuit.							
			Correction: The trees were removed from the pole line restoring the system.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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188	9/28/1998	BNSF	CTC			BN 9497	None	Logan, WY	N
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**Phantom Signal - Due to Sun Angle**

Approximately 0745 MDT, BN 9497 with 0 loads 116 empties, train symbol EMEANA252, was stopped in approach of absolute westbound Main Track 3 signal 3W displaying Red/Red, at a distance of approximately 12 car lengths for approximately one hour. Conductor on ground giving a roll-by to an eastbound train on Main Track 2 was notified by Engineer at approximately 0845MDT that they had a PROCEED indication for westbound movement at 3W signal. Conductor boarded train and agreed that they had what appeared to be a Red/Yellow signal. Train proceeded westbound to a distance of approximately 7 car lengths from 3W signal, and observed a Red/Red. Crew notified dispatcher, and Signal Supervisor, Maintainer and Inspector were called at 0855 MDT. Crew statements were obtained, and dispatcher held train traffic to allow for signal tests. Signal Supervisor observed 3W signal from BN 9497 at a distance of 7 car lengths and observed a Red/Yellow/Red aspect. VHLC logs from control point Crossovers 72.5 were downloaded. Logs show that 3W absolute control signal had not been requested by the dispatcher and that 3W signal displayed Red/Red while the BN 9497 westbound was in approach to 3W. Office logs at Fort Worth indicate that the 3W signal had not been requested by the Dispatcher. Operational tests performed on signal system with no exceptions taken. 3W signal is a two unit colorlight with green, yellow, red lens in the top unit and green, yellow, red lens in the bottom unit. No exceptions taken with condition of the top or lower unit internal and external lens assemblies. Both units were equipped with snow shields. Lamp voltages were tested with no exceptions. Signal Supervisor reenacted incident in the same position in which the crew observed signal 3W and could distinguish a Yellow aspect in the lower unit caused by sunlight reflection from approximately 0815 until 0835 MDT.

Corrective action: Individual visors were installed on green, yellow, and red light units on top and bottom colorlight units. Signal was observed at approximately 0834 MDT on September 29, 1998 with overcast sky conditions, and with sun in same position on subsequent days and no exceptions were noted. Phankill screens will be installed and evaluated to determine their effect as deterrent against external light sources and reflections.

189	10/19/1998	BNSF	CTC			BN 7908, HPASFT	GRS SA Mechanism	Spokane, WA	Y
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**Vandalism - Signal Damaged, Caused Unintended Signal Aspect**

At Parkwater Interlocking, the BN 3018 light power took a Flashing Yellow signal eastward at Parkwater. He went through the OS and onto the East track, 1E signal did not return to the Red position when de-energized. The GRS SA mechanism stuck in the Yellow position. This gave the BN 7908 a more favorable signal (Yellow) than intended. The 1E signal did drop off when the BN7908 entered the OS. The BN7908 proceeding on the Yellow aspect struck the BN 3018 which was stopped causing @ \$200 00 damage and no injuries. We were able to duplicate the stuck mechanism in our tests. The 1E signal had been vandalized and may have caused the mechanism to stick. The GRS SA mechanism was replaced and the new mechanism was tested, and system restored to service.

Incident called in to FRA and recorded as Case # 460535 by Rutherford.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			<b>Cause</b>							
			<b>Narrative</b>							
<a href="#">190</a>	11/17/1998	BNSF	CTC			UPSACD, Engine #	70 L Signal	Kansas City, MO	N	
			<b>Human Error - Field Wiring Error, Inadequate Service Testing</b>							
			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.							
<a href="#">191</a>	12/28/1998	BNSF	CTC			LSEOE8151-27	SA Signal 42RA	West Aurora, MO	N	
			<b>Human Error - Field Wiring Error, Inadequate Service Testing</b>							
			At approximately 0040 hours, December 28, 1998, westbound train LSEOE8151-27, 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.							
<a href="#">221</a>	1/3/2000	BNSF	CTC			Amtrak 1006	3E Signal, Congress Park Control Point	Brookfield, IL	N	
			<b>Human Error - Train Crew Took Wrong Signal</b>							
			Amtrak 1006 EB main 3 was lined main 3 to 2 at Congress Park (CP) control point through 1 switch reverse. Engineer alleges approach signal was CLEAR and controlled signal was G/R/R. Train took diverge route as intended. Tested all signal mechs (all signals were searchlight), switch correspondence relays, and signal control relays in route. All circuitry free of grounds. Indication locking tested. Signal system found to be working as intended. After the interview with the crew, it is felt the engineer and Road Foreman mistook the EB signal on the opposite end of the plant governing movement over a switch onto main 3 for his high green and missed the R/G/R at the West end of the plant.							
<a href="#">222</a>	1/25/2000	BNSF	CTC			Local	Signal 76L	Ft. Scott, KS	N	
			<b>Human Error - Signal Circuit Design Error, Inadequate Service-Testing</b>							
			Local train, while switching train at Ft. Scott yard, reported seeing Flashing Red on main one and a Flashing Yellow on main two southbound at absolute signals South Ft. Scott, KS. Upon arrival it was determined that if code 4 was received on both main tracks from the south and either southbound signal was lined, that both the Yellow signal that was requested and Red on the adjacent main track would flash. Investigation revealed that a yellow signal repeater contact break was not in the light energy circuit.							
			Yellow repeater check was added to the light energy circuits, operational tests were performed and all systems working as intended.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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223	1/30/2000	BNSF	AB			Amtrak #4-27	Signal 8552	Waldo, New Mexico	N
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**Vandalism - Signal Mechanism Shot - Stuck in Position**

Amtrak #4-27 reported passing approach signal to Waldo, Signal #8572 with CLEAR indication. Also reported passing 8552 signal at West End Waldo with CLEAR indication. Upon passing curve at MP 855.1, observed train H-DENBAR1-29 pulling into siding and still the OS section at East End Waldo. Amtrak 4-29 placed his train in emergency and was able to stop short of Red signal at East End Waldo. (8542 Signal).

Signal forces called to investigate. Upon arrival, Supervisor of Signals found the searchlight signal 8552 had been shot into by person/persons unknown. Signal relay was broken and bullet fragments had jammed H-5 signal relay in the Green position. Relay was replaced and signal system tested and found no further exceptions. Cross and Ground Test was made upon arrival as well and no exceptions found.

Special Agents were notified as well as County Sheriff's Office to make report of vandalism.

224	2/11/2000	BNSF	CTC			XSPMWLM110	Signal 144R	Kansas City, KS	N
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**Vandalism - Pole Line**

XSPMWLM110 was northbound on main track 2 and reported, while a train was still in the block between Rosdale and 30th Street, North Bound Signal at Bravo displayed Yellow then Red then Green then Red then Yellow. This was reported to repeat several times. Bravo is at MP 5.6, Rosdale is at MP 3.9 and 30th Street is at 2.2. There are no intermediate signals in between these control points.

Investigation revealed bailing wire in pole line at MP 3 was shorting Main 1's 22RHD1 circuit to Main 2's 6LR1 circuit. This allowed positive battery to bypass the breaks in the track circuits north of MP 2.85. The dispatcher had requested a signal north bound at Rosdale Main 2, when the rear of the first train passed north of MP 2.85 the signal at Rosdale would clear intermittently, allowing a Green aspect to be intermittently displayed at Bravo.

Bailing wire was removed from pole line. Operation tests were performed and the system operated as designed. Cause is due to vandalism, Special Agents and police notified.

Report #	Date	Reporting Carrier	Block System	Interlocking System	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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225	4/24/2000	BNSF	CTC			BNSF 4970, ZWSP	Line Wire and Inverter	Kernan, IL, Signal 811	N
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**Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)**

Train ZWSPNB9-24B, Engine BNSF 4970, operating westward on main track No. 1 approaching control point at Kernan went by the approach signal at MP 81.64 (Sig 811) displaying APPROACH MEDIUM. The home signal at Kernan was at STOP. The Signal Supervisor and two Maintainers responded and put all signals to STOP. Investigation revealed that a 480V AC wire had come untied from its insulator with the tie wire still attached to it. The high winds blew the 480V AC line wire off the crossarm and it dropped down to the area of the secondary arms below. The tie wire that was still attached to the 480V AC line wire allowed it to touch the "NMR" line wire. When this happened, the 480V AC fed back into the control point, burning up an inverter, causing a ground on the battery that feeds the "NMR" circuit. The ground allowed current to bypass the circuits at Kernan and energize the "NMR" relay at Signal 811, causing it to display APPROACH MEDIUM. The linewire was restored to its insulator, the inverter was replaced and signal system tested for proper operations and returned to service.

226	5/5/2000	BNSF		Remote		BN7269/MLAUNTW	None	West Fargo, ND	N
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**Phantom Signal - Due to Sun Angle**

Engine number BNSF 7269 was given permission and a signal from the West Fargo Interlocking up to JY Jct. The dispatcher said they would not get a signal at JY Jct. because there was a switch engine switching at Fargo Yard Office. The dispatcher would talk the train by the signal at JY Jct. When the train got there, they stated that they saw a Red signal. When they were about twenty car lengths from the signal the crew indicated that the signal appeared Yellow. At that point, they called the dispatcher to get permission to take the signal. The dispatcher said he had not called for a signal at JY Jct. and his computer showed JY Jct. at STOP. The dispatcher then talked the train past the signal at JY Jct.

The field HLC log and the Fort Worth office logs had the same information for JY Jct. (i.e. no signal was called and the signals were red). JY Jct. is equipped with searchlight signals and the HLC monitors the red repeater relay, which had not dropped.

The Signal Inspector and Signal Technician tested the relays, the signal mechanism, voltage at the bulb, which was 10.4 volts, and megged the cable to the signal. No exceptions were taken with any of the tests.

The Signal Supervisor rode an engine with the conductor and brakeman on the following day, May 6, at 14:45 hrs. to recreate the incident. It was a cloudy day and the signal displayed aspects as was intended. The supervisor dropped flags at the location where the crew saw the red signal and where the train stopped and the crew said the signal was yellow. The day the incident occurred it was a clear sunny day. In order to recreate the conditions the locations when the signal was seen to be Red and Yellow were marked for future testing.

On May 7, at 14:45 hrs. the Inspector and Maintainer again observed the signal. It was partly cloudy. It appeared to these employees that the signal was Red and may have appeared Yellow at the closer in point to the curve.

The corrective action taken will be to turn the searchlight head slightly to the west and install a phankill lens.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			<b>Cause</b>							
			<b>Narrative</b>							
<a href="#">227</a>	5/6/2000	BNSF	CTC			Z-WSPSBD-104	Westbound Signal Main Track Two	Barstow, CA	N	
			<b>Phantom Signal - Due to Sun Angle</b>							
			<p>At 0755 hours Pacific Time train crew reports that they were stopped on Red over Red signal at station Barstow. Train was approximately 500 feet to 1000 feet from the signal. Train crew said they saw signal go to Red over Yellow and they proceeded to take signal. When train was one engine length from signal train crew observed signal was Red over Red but could not stop train from entering OS. Field logs and Digicon logs do not show signal ever being cleared or requested to clear. Could not duplicate event in field. This signal is in direct line of rising sun but at 0845 hours I (Signal Supervisor) arrived on scene and looked at signal on main track two and noticed some sun glare on signals but not excessive. Terminal Superintendent and myself (Signal Supervisor) have arranged to ride train at same of morning on May 7th, 2000.</p> <p>On morning of May 7th, 2000, we reenacted event and observed that indeed at this time of morning sun was directly reflecting on the red lens. The glare was bad enough to make the signal appear to be Yellow.</p> <p>Correction: Added hood over red aspect to reduce the potential of sun interference.</p>							
<a href="#">228</a>	5/30/2000	BNSF	CTC			ZNBYWSP2-28A,	None	Courtney, MO	N	
			<b>Loss of Shunt - Possible Rust or Foreign Material on Rail</b>							
			<p>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.</p>							
<a href="#">229</a>	7/25/2000	BNSF	CTC			Train SLGBNYC6-2	None	Ormonde, IL (Chillicothe Sub)	N	
			<b>Scenario Reenacted, Unable to Duplicate, No Defects Found</b>							
			<p>Train SLGBNYC6-22, operating eastbound on Main track 2 reported that he had a CLEAR (Green) signal displayed at Signal 1942 and then had a DIVERGING CLEAR (Red over Green) at Ormonde control point. The Signal Supervisor, Signal Inspector and Signal Maintainer responded to interview the train crew, recreate the lineup and perform tests to verify the conditions of the signal system. When the lineup was made to simulate the conditions as reported by the train crew, the proper aspect (Flashing Yellow) was displayed at signal 1942. After performing cross and grounds, visual and operating characteristics of appropriate relays, megger tests of cables and visual inspections of the pole line and instrument cases, no exceptions were taken. Signal 1942 was observed for alignment and visibility with no exceptions taken. The Signal Supervisor interviewed the train crew prior to beginning testing. They stated that they could see signal 1942 without any problem. It was also noted that the train crew was not completing the Signal Awareness Form as required by BNSF System Special Instructions.</p>							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			<b>Cause</b>							
			<b>Narrative</b>							
<b>230</b>	8/2/2000	BNSF	CTC			GCCMTAC931	169.7	Culbertson, MT	N	
			<b>Human Error - Field Wiring Error, Inadequate Service Testing</b>							
			After a cutover a signal man called Supervisor and then a train crew member of the train reported to Signal Supervisor that at approximately 1500 MDT his westbound train had passed signal 169.7 (the approach to East Culbertson) displaying a Yellow over Yellow. The signal at East Culbertson was Red over Lunar. Signal crew had just installed new intermediate signals between Culbertson and Snowden. The approach signal was configured for a signaled siding that will be cut in later this month. During checkout there was missed communication between parties at approach signal and control point. The control point was modified to not allow a Code 3 to be transmitted. System checked and operating as intended. Decision reached by this group that all future cutovers will have aspect chart at EACH location. Counseling session will be held with this group to discuss aspects and the importance of diligently observing and relaying them during a cutover.							
<b>231</b>	8/25/2000	BNSF		ATC		BN2375	Track Ckt	Seattle, WA	N	
			On 8/25/2000 at about 1100, Light Engines BN2375, BN2723, and BN 2734 were sitting on the round house track at a Red signal at MP4. Work Train W TacPac-25, BN2871, was pulling off the main line at the hand throw switch just west of the plant at MP4. When the work train cleared the main track and was on the fouling track, a switchman normalled the hand throw switch for main line traffic. After a few seconds the signal cleared to Green for the light engines to come out of the yard while the work train still occupied the fouling track. Inspections found that both long fouling jumpers that connected outside rail to outside rail of the turnout were broken off the rail. With the fouling wires broken, the system did not detect the cars shunting the track. Both fouling jumpers were repaired and tested. An investigation is pending.							
<b>232</b>	10/3/2000	BNSF	CTC			BNSF 9819, C-BTM	EC II Unit	Humboldt, NE	N	
			<b>Failed Equipment or Device - Electrocode Module</b>							
			Signal cable had been damaged by a backhoe at E. Humboldt, NE, MP 135.65. In the process of repairing the cable the train crew reported that they observed the eastbound signal go from an APPROACH aspect to a CLEAR aspect at W. Humboldt, MP 137.3 for 5-10 seconds then drop back to the APPROACH signal. Signal personnel determined that a portable radio being used for the testing of E. Humboldt caused the codes being transmitted to W. Humboldt from the Electrocode II box to upgrade. The radio was a Motorola HT 600, 5 watt.							
			Corrective Action Pending: Harmon/GE Harris Corp. has been notified in regards to the failure.							

Report #	Date	Reporting Carrier	Block System	Interlocking System	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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<b>233</b>	10/25/2000	BNSF	CTC			BNSF 4594	Rail (Insulated)	Wellington, KS	N
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**Loss of Shunt - Possible Rust or Foreign Material on Rail**

MCILAC7-24A operating westbound on MT 1, CP 238.5 cut their power from the rest of the train and took a signal westward from MT 1 to MT 1. Then they were given a signal into the yard to pick-up 4 cars. After coupling onto the cars they were lined westward from the yard to MT 1. After traveling west of the eastbound absolute signal the dispatcher normalized the switch and then talked them back onto their train sitting east of the westbound absolute signal. The leading wheels of the BNSF 4594 remained in the OS of CP 238.5 while the power and the additional four cars were coupled onto the rest of the train. During this period of setting at this spot for @ 15 minutes the OS relay re-energized. The dispatcher then requested the 1 West signal clear. The 1 West signal cleared displaying an APPROACH MEDIUM. Upon arrival several meter readings were obtained; current on the relay was 165 milliamps, voltage on the relay was 0.73 volts voltage on the rail was 0.95 volts. A 0.06 ohm shunt was placed on the track and the track relay de-energized with 7mA of current on the relay. The shunt was removed and the relay re-energized. The resistance of the wheels was measured at 0.3 of an ohm. Samples of a light film of unknown origin covering the rail were then taken and the train was talked out of the OS. The OS track relay and a meter were observed while this occurred. The relay de-energized as soon as the wheels started to move with the current on the relay going to 3 mA with the third set of trucks and 0 with the next set of wheels. The thin layer of grease coupled with the sand from the locomotive and the moisture from the rain appeared to form an insulating material which prevented the axles from shunting the OS. The subsequent train moves through this location shunted the track without incident. A sample of this substance has been sent to the Topeka Labs for analysis.

Note on top of page: "This should not be charged as a false proceed. Rail Conamination (Rule 136.51)"

<b>234</b>	11/7/2000	BNSF	CTC			H MOD SEL 907	CL	West Seligman, AZ	N
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**Phantom Signal - Due to Sun Angle**

On 11-7-00 at 15:42 the HMODESEL907 eastbound on M2 approaching West Seligman (2E signal) reported a Yellow over Green aspect as they approached the signal for about 1 minute, the signal then appeared to go to Yellow over Red. The N.O.C. log showed the signals lined M2 to M2 West Seligman and M2 to M2 East Seligman. We were notified and ran VHLC logs at West Seligman, main and remote houses, and the approach signal 4324. The logs showed at no time did the 2EBG indicate true at West Seligman during this time. Signal 4324 was Flashing Yellow over Red. Grounds test was performed and was negative. I interviewed the crew at 21:30 over the phone and they indicated it may have been sun related (sun was setting into signal at that time). On 11-8-00 I had Signal Inspector in place to watch the signal from 14:00 to 17:00 and I rode an eastbound train from Kingman to Seligman trying to get to West Seligman at about 15:42. I arrived at Seligman about 17:00 and missed the sun but Signal Inspector Mitchell was able to watch the signal and did notice the sun washing the Red out and the Green was visible. Upon looking at the 2EB signal we found that some of the brackets for bolting the background to the signal head were broken and allowing the wind to blow the background away from the signal and sun could enter the lens area from the side. We replace the 2EB signal head and performed the proper tests. We also ran the VHLC log again and performed a gorunds test, alignment and voltage check on the 2EA and 2EB signals.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			<b>Cause</b>							
			<b>Narrative</b>							
<b>235</b>	11/9/2000	BNSF	AB			Train SCHCTAC2-0	S-Code Approach Lighting Module	Galena, Illinois	N	
			<b>Failed Equipment or Device - S-Code</b>							
			Train SCHCTAC2-09 @ 2016 hours on November 9, 2000 was westbound near Galena, Illinois on Track #1, Minnesota Division, Aurora Subdivision, when Engineer and Conductor reported an APPROACH MEDIUM signal at MP 169.7 into a Red signal at MP 171.4, Galena. Upon arrival by signal personnel, the reported signal aspect could not be duplicated after repeated attempts to simulate the events described by the train crew and the SOC Signal Call Desk in Ft. Worth, Texas. All affected signal equipment at 169.7 was tested with no exceptions immediately noted. A replay of the events leading up to the report did not lend any support to the reported signal aspect. After nearly completing all signal testing on the affected signal network, an intermittent failure was observed by signal personnel. An intermittent failure in the S-Code Approach Lighting Module #72718-20 at signal 169.70 allowed a "flickering" from Yellow to Dark. The "flickering" was not at any measurable code rate, but was displaying Yellow to Dark intermittently. The signal displaying this intermittent aspect is a GRS Searchlight signal. As a result of observing this failure, the S-Code cabinet was replaced and a new Approach Lighting Module was installed followed by complete operational tests.							
<b>236</b>	12/8/2000	BNSF	CTC			LAUPT1 06	Relay	West Stevenson	N	
			<b>Failed Equipment or Device - Relay</b>							
			At approximately 18:30 Pacific Time on 12/8/00, the LAUPT1 -6 was westbound at East Stevenson and viewed a Green over Red signal for westward movement. The dispatcher had West Stevenson lined for Eastward movement into the siding for the MPTLPAS2 08. At that time the MPTLPAS2 08 was having problems at Skamania, approximately 11 miles west of Stevenson. The train crew of LAUPT1 06 knew that they were going to meet an eastward train at Stevenson and stopped before they reached the westbound Red absolute signal at West Stevenson. Signal Supervisor and his testing team found while testing circuits at the West Stevenson that the WAYGP relay (yellow green repeater) remained energized approximately 90 seconds after energy was removed from the coil of the relay. This relay controls the reference chain for the Electrocode 4 unit that transmits Code 7 to the east. At East Stevenson with the power switch lined normal and Code 7 is received from the west, it is decoded and will display a Green over Red signal. The defective WAYGP relay was replaced with field testing complete at approximately 01:00 Pacific Time on 12/9/00. The relay with serial # 532459 is going to be evaluated and tested at our relay repair facility and sent to the manufacturer for further evaluation.							
			NOC trouble ticket 573620.							
<b>286</b>	2/24/2001	BNSF	CTC			P EPEKCK1 24A En	None	Camden, MO	N	
			<b>Human Error - Signal Circuit Design Error, Inadequate Service-Testing</b>							
			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.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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<b>287</b>	3/12/2001	BNSF	AB			C CAMRTR001, En	None	Elesberry, MO	
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<b>288</b>	3/30/2001	BNSF	CTC			R-SCA0111-29	Equation Error in VHLC	Commerce, CA	N
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**Human Error - Signal Circuit Design Error, Inadequate Service-Testing**

The R-SCA0111-29 was lined to follow the V-LACCHC4-29 (3 units of power) from the Vail Lead eastbound to Main Track #1 at MP 148.8 CP Vail. The crew on the R-SCA0111-29 observed that the eastbound signal at Vail, 10E, displayed a Red over Yellow aspect while the V-LACCHC4-29 was still in the block ahead. The R-SCA0111-29 did not proceed until the V train was east of the next Control Point at Bandini and reported the event to the dispatcher.

Field logs and re-enactment were able to recreate the situation.

Cause: The control point at Vail was placed in service on February 12, 2001. The 2E-HR, which is the block between Vail and Bandini on Main Track #1 was not in the logic equation for the 10EB signal and was not identified during in-service testing.

Corrective Action: The logic equation was modified and signal system tested.

<b>337</b>	4/7/2001	BNSF	CTC			ID # EMLMEBM001,	1WA Signal	Napier, MO	N
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**Maintenance - Wiring Chewed by Rodents**

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.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
<b>289</b>	4/8/2001	BNSF	CTC			ID# MLAULIN1-05A	Human Error	Yuma, CO	N
<p><b>Cause</b></p> <p><b>Human Error - Improper Equipment Installed</b></p> <p>The BNSF 8063 was an eastward train sitting in the siding at East Siding Switch Yuma. Eastward train ID# ZDENCHI9-08A, Engine # 4372 passed them on the main track. After the train had passed the dispatcher requested the switch reverse and an eastbound signal out of the siding. The train crew on the 8063 reported that their signal went from a STOP indication to a CLEAR indication. They communicated with the 4372 and determined that they were between the first and second intermediate signals to the east of Yuma. They realized that they should have had an APPROACH indication, stopped their train and reported this to the dispatcher. Signal personnel notified. The investigation revealed that the 40 BD relay should have been a biased relay (GRS A65-120) and was in fact a neutral relay (A65-345). The relay was replaced and the signal system tested with no other problems found. It could not be determined who or when this relay was installed.</p>									
<b>290</b>	4/11/2001	BNSF	CTC			Train YEMP2011-1	Phantom Aspect Signal	Emporia, Kansas	N
<p><b>Phantom Signal - Due to Sun Angle</b></p> <p>Train crew on 3-11-2001 stated that signal 20 RB was Yellow when they proceeded by it eastbound at NR Junction. All dispatcher and field logs show the signal to be Red, switches lined against move, no request ever received. No exceptions taken to all signal testing in field. The operational opinion is that a crew expecting a Yellow aspect might misconstrue the Red aspect to be Yellow at this time of day at this time of year. Signal voltage was at standard prescribed, but a outer lens was changed that did improve visual perception.</p>									
<b>291</b>	5/9/2001	BNSF	CTC			BNSF 8234, Train P	Improper Wiring - Human Error	Vernon, CA	N
<p><b>Human Error - Field Wiring Error, Inadequate Service Testing</b></p> <p>Signal gang was wiring in permanent circuits for a switch lock located at MP 145.3 to new vital house MP 145.1. They relocated temporary line protection thru NWBP circuit from the field side of arrestor to house side of the arrestor wire one wire at a time. They hooked up a new circuit that was intended for the next phase cutover on top of the existing NWBP circuit thus introducing foreign battery with straight polarity. When the 2W signal at East Hobart was cleared it went to Green over Red instead of the proper aspect Yellow over Red. Wiring was removed and all affected circuits tested.</p>									
<b>292</b>	7/25/2001	BNSF	AB			C ATMMAS1-03, E	Poleline	New London, Iowa	N
<p><b>Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)</b></p> <p>Train C ATMMAS1-03 stopped at Red Sig S220.6. There was a train in the block ahead, stopped at Sig S218.8. When the train ahead moved out of the block ahead, Sig S220.6 went to Green instead of Yellow. The Signal Supervisor and Maintainer were notified to perform tests and inspections at the location. The tests revealed foreign battery on the SD wire for Sig S220.6 caused by a cross between SD and ND on the poleline. A pole had fallen over and twisted, allowing the line wires to sag to the brush and weeds, causing the crossed battery. There had been rain and the weeds and brush were wet allowing current flow. The pole was repaired, the system tested for proper functioning and returned to service.</p>									

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
			<b>Cause</b>						
			<b>Narrative</b>						
<b>293</b>	7/29/2001	BNSF	CTC			SCWSLBP1 28	CL-5483	Amarillo, TX	N
			<b>Failed Equipment or Device - Electrocode Module</b>						
			WB train SCWSLBP1 28, on MT 1 reported westbound signal 5483 MT 2 Green with eastbound train, HBARKCK1 28, on the eastbound approach to signal 5484/5483 on MT2.						
			Upon arrival signal 5483 was observed to be dark. A shunt was placed on the eastbound approach to signal 5484/5483 on MT2 signal 5484 was Yellow and signal 5483 was dark/dark. 40 seconds later signal 5483 went Dark/Green for @ 3 seconds then went back to dark/dark. This scenario repeated itself every 40 seconds. The 213 module in the Electrocode 4 cabinet had been damaged by lightning storms that had been in the area was changed and required tests performed. The signal system was then returned to service working as intended.						
<b>294</b>	8/21/2001	BNSF	CTC			M KCKIHB1 19, Eng	None	Ransom, IL	Y
			<b>Scenario Reenacted, Unable to Duplicate, No Defects Found</b>						
			Train M KCKIHB1 19, Engine ATSF 663, alleges that while operating eastbound on Main Track 2 near Ransom, Illinois, they proceeded past block signal 812 displaying a Flashing Yellow aspect and then collided with the rear end of train Q LACNYC1 17, which was stopped just beyond signal 782. The train crew did not know the aspect displayed by signal 782. The signal instrument housings in the area were locked until the arrival of a FRA representative. The signal housings were jointly entered by the FRA representative and signal supervision of BNSF. The position of relays were noted with no exceptions taken. Testing of the signal system was initiated to simulate the train movements with no exceptions taken. Cross and grounds, megger and relay visual and electrical tests were performed on associated apparatus with no exceptions taken. The wiring in the signal mast at Signal 812 was removed for visual inspection with no exceptions taken.						
<b>295</b>	8/26/2001	BNSF	CTC			Z-KCKRIC1-26A M	Line Circuits were Wrapped	Kansas City, Kansas	N
			<b>Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)</b>						
			Crew of Z-KCKRIC1-26A westbound on Main 3 proceeding on Green/Red at Holiday MP 13.5 reported seeing a Yellow/Green at Int. MP 12.8 Main 1, and analyzed that the aspects display would be a conflicting route to their route at West Holiday MP 14.40. They reported situation to dispatcher and dispatcher had the westbound SCWSLBP1-25, who had not reached Morris MP 11.0, proceed prepared to stop at signals 12.8 and at West Holiday. This train crew saw the Yellow/Green at MP 12.8 and had a Red/Red at West Holiday Main 1. Signal forces were able to duplicate the Yellow/Green aspect at MP 12.8 and Red/Red at West Holiday. Line wraps in the 21 LGRN-NWBP1, 21 LGR-NWDP1 and 24 LMRN-NWBP circuits discovered and removed. ACG/DC to DC converter also added to isolate batteries on 21-LGR and 21-LGRN circuits. Line wraps due to storms in area and problem intermittent. All circuits tested and signal system returned to service.						

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			<b>Cause</b>							
			<b>Narrative</b>							
<b>296</b>	8/31/2001	BNSF	CTC			NS-112-28, Engine		Kansas City, Kansas	N	
			<b>Phantom Signal - Due to Object in Foreground or Background</b>							
			Crew of NS-112-28 westbound stated that they had a Yellow over Red at 12th Street main 2 and a Yellow over Red at AY (CP 39) on main 2. Signals were taken out of service. The dispatcher and field logs show that a signal was never requested or indicated at AY (CP 39). There were no exceptions taken in all field tests. Signal system was restored to service. On 09/01/2001 at the same time (1059 hours) as incident with the same engine the signals were observed on main 2. Signals were Red over Red until nearing the 2W signal. At that time an eastbound train loaded with double stack containers on main 3 went by 2W signal and the top head could be perceived as Yellow, Lunar, or Red account sun reflecting off the top of the aluminum containers causing a phantom aspect. The outer lens of the H-5 (2WA) signal were removed and signal head was re-aligned. The aspects were then observed with container train on main 3 and no phantom aspects were observed.							
<b>297</b>	10/22/2001	BNSF	CTC			MGALCNI1-22, Eng	None	Verona, Illinois	N	
			<b>Maintenance - Rodent Nest in Signal Apparatus</b>							
			At approximately 7:20 PM on October 22, 2001, the MGALCNI1-22 reported that eastbound main 2 Signal 732 was displaying a CLEAR aspect and that the home signal at Verona on main 2 was Red. A Signal Maintainer had been sent to the location on another issue (controlled signal would not clear), when this report was generated. Through follow up conversations with the Ft. Worth control office technicians, the Signal Maintainer investigated the original report as the signal slotting off in the field and not a false proceed aspect. Subsequently, another report was generated and the Signal Supervisor and Signal Inspectors were dispatched to the location to perform tests and investigate the cause. Their findings were that a mouse had built a nest containing steel wool in the junction box base of the 4R Signal (Eastbound Signal on Main 2) at Verona, causing a crossing between the 4RNP, 4RAHDP, and 4RBHDP terminals. The nest was removed and further testing of the signal system was performed to verify proper operations.							
<b>298</b>	11/5/2001	BNSF	CTC			CMCMJCC324A, B	2LA Signal	Defiance Wye Spur, MP .6, Defiance Sub.,Ga		
			<b>Insufficient Information in Report to Assign Cause</b>							
<b>299</b>	11/15/2001	BNSF	CTC			L TWI8101 15	SA-1 Signal Mechanism	Minneapolis, MN MP 16.3, Control Point		
			<b>Failed Equipment or Device - Relay</b>							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			<b>Cause</b>							
			<b>Narrative</b>							
<b>334</b>	1/22/2002	BNSF	CTC			Unknown	Signal	Phillipsburg, TX	N	
			<b>Human Error - Signal Circuit Design Error, Inadequate Service-Testing</b>							
			Engineering changes were to be made to convert Red over Flashing Yellow aspect to Red over Yellow aspect prior to January 20, 2002 when the new System Special Instructions and Division Timetables to be in effect. The new timetable removed the rule in item three of the type of operation section that had previously covered signals not conforming to the DIVERGING APPROACH rule. The changes were overlooked and never made resulting in a westbound train taking the siding at East Phillipsburg on a Red over Flashing Yellow aspect with the next signal at West Phillipsburg was displaying STOP indication. The proper aspect at East Phillipsburg should have been Red over Yellow.							
<b>335</b>	3/12/2002	BNSF	AB			RNCA 0023-12A	None	Maltby, CA	N	
			<b>Scenario Reenacted, Unable to Duplicate, No Defects Found</b>							
			Road Switcher RNCA 0023-12A reported seeing Signal 1166.1 go from Red to Green then back to Red while ETD of ZMEMRICH-109A was still in view.							
			Incident took place at 2020 PST. Crew reported incident at 2400 during job debriefing at end of shift. Signal was immediately taken out of service and Signal personnel were called to investigate. Cross and Ground tests, Relay tests, Cable Insulation tests and progressive shunt test of location were made with no exceptions found. Signal 1166.1 was put back in service at 0710 PST 03/13/02.							
			Interview with Train Crew was conducted and it was determined that they had followed two trains westbound out of Port Chicago MP 1164. The first was Local LNCA 2141-12A which cleared in the siding at Maltby. The second was ZMEMRICH 109A. RNCA 002312A witnessed normal signal operation in ABS. When LCNA lined the switch behind them after clearing in the siding Signal 1166.1 went Green for ZMEMRICH 109A then dropped Red as he entered the block and stayed Red until they left the block. RNCA 00213-2A witnessed the Green from 1 1/2 to 2 miles away while in approach to Signal 1165.1 and couldn't tell where the ETD ahead of them was in relation to Signal 1166.1.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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<b>336</b>	4/30/2002	BNSF	CTC			BNSF 4958	ECII-5K Module	Moorcroft, Wyoming	N
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**Failed Equipment or Device - Electrocode Module**

At approximately 0937 AM MDT eastbound VTACMEM827M-BNSF 1117 reported to dispatcher that intermediate signal 574.6 dropped from APPROACH MEDIUM Flashing Yellow to Red, while following a eastbound. BNSF 1117, after stopping and reporting to dispatcher, proceeded at restrictive speed to intermediate 572.8 which displayed Flashing Yellow, APPROACH MEDIUM and continued eastbound to Moorcroft.

At approximately 1000 AM MDT eastbound XVAWHON927A - BNSF 4958 with 3 units no loads 107 empties 3300 tons, no hardous cars, following the BNSF 1117 reported intermediate signal 574.6 at Flashing Yellow, APPROACH MEDIUM, and as they approached intermediate signal 572.8 which was Yellow, APPROACH, at a distance of approximately 1300 feet it began flashing Yellow at a rate of 25-27 flashes per minute. BNSF 4958 passed intermediate 572.8 at 27 mph and stopped at intermediate 570.8 which was Red, with the BNSF 1117 in advance at approximately 20 car lengths. Crew reported incident to dispatcher at 1005 AM. Dispatcher did not hold the BNSF 1117 nor the BNSF 4958.

Maintainer was called to investigate dropped signal at intermediate 574.6 at 943 AM, Supervisor Signal and Inspector were called at 1010 AM and arrived at approximately 1030 AM. Maintainer arrived at intermediate 574.6 at 1020 AM and Supervisor and Inspector arrived at intermediate 572.8 at 1030 AM.

Signal employees reenacted the train movements of the BNSF 1117 and the BNSF 4958 and determined at intermediate signal 572.8 the Electrocode IIC cabinet was outputting from 3 VDC to 13.4 VDC to the HER relay at a rate of 25-27 fluctuations per minute, while receiving a Code 2 from the intermediate at 570.8. Both the Supervisor and Inspector observed the HER relay releasing and picking, and observed signal 572.8 flashing in correspondence with the HER relay, at a rate of 25-27 flashes per minute. Signal displayed a normal Yellow with 9.0 VDC on the GEM bulb, then a dim Yellow with Approximately 3.9 VDC on the bulb during the release and pickup of the HER relay and did not display Red. 5K Code 2 decoder module was replaced and signal system tested for proper operation.

Suspected bad order 5K module will be sent to manufacturer for inspection and disposition.

Incident occurred on 4 aspect CTC territory with Electrocode IIC coded track circuits, Safetran colorlight signals, and WABCO PN150 relays.

<b>338</b>	5/14/2002	BNSF	CTC			KCKOKC 9-14	Flashing Yellow Aspect Control Not Remo	Lebo, Kansas	N
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**Human Error - Field Wiring Error, Inadequate Service Testing**

Train crew of KCKOKC 9-14 westbound reported Red over Flashing Yellow aspects while making a crossover move from main 2 to 1 at Ridgeton. The next westbound intermediate signal was Red. Supervisor Lefler reported that the control circuits that produce the Red over Flashing Yellow had not been removed as planned before timetable change. Due to Hours of Service law the crossovers were removed from service for night. May 15, 2002 the Red over Flashing Yellow aspect was removed at Ridgeton and the location was tested with no exceptions.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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339	5/20/2002	BNSF	CTC			Unknown	CPL	Stockton, CA	N
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**Vandalism - Instrument Case, Cable, or Junction Box Damaged**

WB train (ID unknown) reported 2W signal at MP 1120.7 displayed Red/Green indication for route through #1 crossover UP Diamond into Red 77LB signal MP 1122.2 at West Stockton. Signal Maintainer was notified at 14:05 and confirmed aspect at 15:44. Signal Construction Supervisor was notified immediately and Maintainer was instructed to protect the route by spiking and clamping the #1 crossover in the normal position, open battery to the switch motors and to notify the Dispatcher that the crossover was out of service until investigation could be completed. Investigation revealed cause to be failure of cable conductor insulation and shorting of B10 to 77LBHDP circuits in ground mounted junction box at West Stockton.

Previously Dwarf Signal 77LB had been run over and destroyed by loader replacing switch panel at West Stockton. Signal had been replaced by Construction Gang. Cross and Ground, Color tests and appropriate locking tests had been performed by Signal Inspector with assistance, and all tests completed with no exceptions noted.

Upon further investigation, it was determined that the ground mounted junction box had also been driven over by the loader and had broken at the connection to the riser box, below ground level. This damage was not visible under normal inspection. The cable conductors that shorted were stretched across the break and the stress on the conductors had gone undetected during re-installation and testing of the signal.

Corrective action: Junction box was replaced, B10 and 77LBHDP circuits were moved to spare conductors within the cable, appropriate tests were made to assure system was working as intended, crossover #1 at UP Diamond was put back in service at 11:30 AM 05/21/02.

340	6/2/2002	BNSF	CTC			ZKCKLAC1-01	None	Clovis, NM	N
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**Human Error - Track Relay Inverted**

On June 2, 2002 at approximately 12:05 MT the KCKLAC1-01A train reported to the Assistant Trainmaster and the Dispatcher that they had a DIVERGING CLEAR aspect at control point Clovis, MP 657.6 on Main Track 2 with seven cars from the eastbound QLACAUG1-31B in the fouling section of the turnout into the South Siding switch off of Main 2. The Signal Supervisor was called and arrived on the scene and observed a false proceed condition. Upon investigation the Signal Supervisor discovered that the 3BXTR track relay which is used to detect trains in the fouling section South Siding switch was in the inverse position. The relay was placed in the proper position and signal changed from DIVERGING CLEAR aspect to STOP aspect.

Trains were cleared from the area for signal testing per dispatcher instruction through the control point. When tracks were cleared, track and time was obtained from the dispatcher and all track circuits in the plant were tested and verified to be working as intended. In addition, all routes through the plant were also tested with no exceptions found. After tests were completed the track and time to the dispatcher was released and the control point at Clovis was returned to service.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			<b>Cause</b>							
			<b>Narrative</b>							
341	9/23/2002	BNSF	CTC			P-PHXCHII-21A	None	Ft. Madison, IA	N	
			<b>Human Error - Signal Circuit Design Error, Inadequate Service-Testing</b>							
			<p>Train P-PHXCHII-21A was following train Z-ALTWSP2-22B operating eastbound on Main Track 2 and crossing over to Main Track 1. Eastbound absolute signal at West Ft. Madison was lined to make a follow-up move from Main Track 2 to Main Track 1 behind the Z-ALTWSP2-22B. Crew reported that the eastbound absolute signal displayed a DIVERGING CLEAR aspect. The eastbound absolute signal should have displayed an APPROACH DIVERGING due to the Z-ALTWSP2-22B occupying the block east of the automatic signal at MP 235.</p> <p>Signal Department employees were dispatched to the locations. Data logs were retrieved and reviewed, operational tests were conducted, and eastbound absolute signal for this route was lined with no exception being taken. Battery grounds and cross battery test were performed. Signal system worked as intended.</p> <p>Follow-up testing continued on September 24, 2002. During this testing the report from the train crew was confirmed. The false proceed was caused by an engineering design error. Circuit modifications were made to correct the problem and the signal system tested with no further exceptions.</p>							
342	10/30/2002	BNSF	CTC			L-CHI0081-30A	None	Ethel, MO	N	
			<b>Human Error - Signal Circuit Design Error, Inadequate Service-Testing</b>							
			<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>							

Report #	Date	Reporting Carrier	Block System	Interlocking System	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			<b>Cause</b>							
			<b>Narrative</b>							
343	10/30/2002	BNSF	CTC			E-CDJJRM0-05A, B	Insulated Joints	MP 78.0 MT3, MP 77.8 MT3, Bill, WY	N	
			<b>Failed Equipment or Device - Insulated Joint(s)</b>							
			<p>E-IOGCDM0-71A BNSF 8833 with 0-118-2584 tons, westbound MT3 between intermediate 3-75.3 and CP 72.5 with a DIVERGING CLEAR aspect at 72.5 CP. Following train E-CDJJRM0-05A BNSF 8883 with 0-136-3406 tons, westbound MT3 West Bill CP received a Yellow/Red aspect on the 3WA West Bill at 18:31:15 for 27 seconds, dropped to a Red/Red for 9 seconds, changed to Green/Red for 8 seconds, changed to Red/Red for 17 seconds, and then to Flashing Yellow/Red for 4 min. 25 seconds with the BNSF 8883 taking the OS at West Bill at 18:37:46. The first train BNSF 8833 entered the OS at CP 72.5 at 18:36:49. A track indication came in behind the BNSF 8833 at 18:32:03 and picked up at 18:32:16. 3WA West Bill should not have upgraded to Green/Red, it should have displayed Flashing Yellow/Red. Track circuits are Electrocode 4+, with 1 Electrolock at MP 77.8 with VHLC controls at 72.5 and West Bill. During tests and re-enactment, both insulated joints at intermediate 78.1 joints were found to be fully shorted on main track 3, and 1 insulated joint was failing at Electrolock MP 77.8. From this find, the probable cause of the 3WA displaying Green/Red was due to intermixing of codes from the intermediate signal 78.1 combined with codes from the Electrolock at MP 77.8. Insulated joints were replaced October 31st, unable to duplicate the Green/Red with shunts around the new insulated joints. Grounds and megging tests revealed no exceptions. Track wires were cross megged to all 3 tracks at intermediate signal 78.1 and no exceptions were taken.</p>							
345	11/23/2002	BNSF	CTC			PRICBIRI20A, CSXT	195TR & 195XTR	Memphis, TN	N	
			<b>Vandalism - Instrument Case, Cable, or Junction Box Damaged</b>							
			<p>At 2235 hours the PRICBIRI20A reported that the southbound signal on Main 1 at South Yale was showing an APPROACH aspect while the CSXT 269 was still fouling the main track. The crew of the CSXT 269 while backing off Main 1 into the yard at South Yale reported seeing the switch throw back normal while they were still occupying the circuit. Signal Supervisor and two Signal Maintainers responded to investigate. The Signal Supervisor and Maintainers found that they could not open the left door to the instrument case that housed the relays for this location. Damage was discovered at the bottom front corner of the relay case. Upon opening the right door and looking down the shelves, they observed three relays lying on their backs. The 194 RTR, 195 TR, and the 195 XTR were turned on their back. The relays were placed in their normal position and tested for proper shunting. Further testing was performed to confirm the proper operation of the 195 switch and 194L signal with no exceptions taken. It is believed that whatever damaged the instrument case caused the relays to be knocked out of their normal position on the relay shelf.</p>							
344	11/26/2002	BNSF	AB			VMCISBD8-25	None	Coal City, Illinois	N	
			<b>Scenario Reenacted, Unable to Duplicate, No Defects Found</b>							
			<p>Train crew on westbound VMCISBD8-25 allege that they went by automatic signal 511 which displayed a Green aspect, then observed the next signal, 541, displaying a Red aspect, which then upgraded to Yellow and then Flashing Yellow. Signal 511 should have displayed a Yellow aspect due to a train ahead. Signal department employees responded and performed tests to simulate the position of the trains involved, with no exceptions taken to the aspects displayed by signal 511. Further testing was conducted including cross and grounds, electrical tests of all relays, shunting sensitivity tests of track circuits and megger tests of all cables. Visual inspections were performed of all junction boxes and the poleline with no exceptions. The internal wiring in the signal mast at signal 541 was removed for visual inspection with no exceptions taken. At the conclusion of all tests, inspections and shunting, no exception to the operation of the signal system was taken.</p>							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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<b>375</b>	2/5/2003	BNSF	CTC			UROOEV105A	None Found	East North Dalles, VA	N
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**Scenario Reenacted, Unable to Duplicate, No Defects Found**

The train crew of UROOEV105A reported that at around 14:30 Pacific Time on February 5, 2003, they observed a Flashing Yellow at the westbound intermediate signal 96.1 into a Red over Red at the East North Dalles control point. There was a train ZHCPTL903A on the siding at that time, and the switch was lined reverse. This was reported to the Signal Supervisor on 2/14/2003 at around 08:30. The dispatcher's log showed that a westbound signal was requested into the siding, but would not clear. There was also a train parked on the main at this time. The train crew reported it to the dispatcher, but when the Signal Maintainer heard the conversation, he told them he would take care of it. He told me he did not recognize the problem as an alleged false proceed, so he did not call for help.

Signal technician tested the signal at 96.1 on 2/14/2003, and took no exception to this location. Signal Supervisor, Signal Technician, and Signal Inspector tested East North Dalles control point, and could not duplicate the problem. There was a recorder at the intermediate signal, but too much time passed and the data had already been overwritten.

<b>376</b>	3/6/2003	BNSF	CTC			ZWSPKCK906	None	Gorin, MO	N
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**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.

<b>377</b>	4/5/2003	BNSF	CTC			Gateway Railroad	54 LB Signal	Kansas City, MO	N
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**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.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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<b>378</b>	4/8/2003	BNSF	CTC			B-RICWAT5-06A	None	Fullerton Jct., MP 45.0, Fullerton, CA	N
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**Cause**

**Narrative**

Phantom Signal - Due to Sun Angle

Train B-RICWAT5-06A, traveling westbound on Main Two MP 165 Fullerton Jct. on the San Bernardino Sub, signals on Main 2 at Atwood for the 4WA signal was Flashing Yellow over Red MP 40.3 and intermediate signal 433 was Yellow over Red on Main Two and at Fullerton Jct. 4WA signal on Main 2 was Red over Red. San Bernardino dispatcher reports ticket # 860065 Fullerton Jct., switch from Main 2 to Main 1 Metro-Link was run through by the B-RICWAT5-06A MP 165 Fullerton. All logs were captured at all three locations. Show signals were F/Y over Red Atwood MP 40.3 and Yellow over Red at the intermediate signal 433 and Red over Red at Fullerton Jct. Reenactment was conducted with Trainmaster and Road Foreman of Engines. After all tests were conducted, found signal system working as intended. Replace repairs were made to No#3 switch at Fullerton Jct., replace lock rods, throw rod, and point detector rod. Reenactment was also done the following morning at same time which revealed sun reflecting on signal from 1250 ft. approaching signal until about 950 ft. Long hoods were placed over all westbound signals which eliminated sun reflection.

<b>379</b>	4/24/2003	BNSF		Remote		G HURINB 1 19, B	2EA Signals (SA Mech)	River Street Control Point, Tacoma, WA	N
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**Human Error - Signal Equipment Improperly Installed**

At about 2:30 PST the train BTACTAC in the Tacoma, WA, yard observed an EB signal on Main 2 that they felt did not go Red when the OS was occupied by EB train GHURINB at the River Street Control Point. The BTACTAC made the next move in the same direction and the same signal and took the time to observe the signal and it did not go Red while they were still in the OS section. The signal did not slot off to Red until the train hit the first track circuit east of the control point. Signal personnel found a bent contact in the plugboard of the 2EA searchlight mechanism that caused an intermittent circuit path to the mech coil. This particular signal was hit by a hanging boxcar door in November of 2002. The signal was replaced at that time, and believe the contact was bent at that time.

2EA Signal SA Mech was changed and tests made to correct the problem.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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<b>389</b>	5/13/2003	BNSF	CTC			S-BPATAC1-10M	Phantom Aspect	East Wishram, WA	N
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**Cause**  
**Narrative**

**Phantom Signal - Due to Sun Angle**

The train crew of S-BPATAC1-10M was headed westbound on the Fallbridge Subdivision toward East Wishram and observed a Yellow/Red at the approach signal 110.1, and proceeded prepared to stop at East Wishram. At approximately 11:50 on 11/13/03 the train got out of the tunnel at M.P. 108.1, they could see the bottom head was Red, but the top head looked dark at East Wishram. Just before they got to the milepost sign at 108, both crew members said that it looked like the top head was Green. They kept looking at the signal, and at M.P. 107.9, they realized that the top head was Red and stopped about 500 feet before getting to the signal. The signal is a color light signal located at M.P. 107.7. Event recorder at the dispatcher's office showed no signal was called at this location, and the recorder in the field showed no signals lined at that time. The signal maintainer opened the circuits to the green and yellow bulbs until testing could be completed. The trainmaster rode the next train through, and said the signal looked dark, but it did have a green "hue."

Field testing showed no defects to signal equipment inside the bungalow, but the top head of the signal was not aligned the same as the bottom head, and the bulb voltage was about 0.5 volt low in both the top and bottom heads. The bulb voltage was raised to 9.4 volts and the top head was aligned the same as the bottom head. The next train crew said the signals looked good to them.

Signal trouble ticket #937845.

<b>380</b>	5/13/2003	BNSF	APB			H-BARVAW1-09	Switch Circuit Controller	West Deschutes, OR	N
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**Human Error - Field Wiring Error, Inadequate Service Testing**

At about 09:30 on 5/13/03, train H-BARVAW1-09 was headed eastbound on the Oregon Trunk when it stopped and the crew lined themselves into the siding at West Deschutes. The signal for movement over the switch should have dropped to Red when they threw the switch, but it stayed Green. The signal maintainer and signal technician went to the location and set the signals to STOP.

The signal maintainer installed new track wires at this location the previous week, from the track to the signal case. He inadvertently bypassed the switch circuit controller when he installed the new wires. He shunted both track circuits after connecting the new track wires, but he did not test the switch because he did not remember that the circuit controller was in the control circuit for the track relay.

The signal technician and maintainer found the old track wires and connected them and tested the system. The circuit was working correctly by 14:00, 5/13/03.

Reference signal trouble ticket number 872336.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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<b>381</b>	5/15/2003	BNSF	AB			U-INBROO115	0.5 Signal	Seattle, WA	N
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**Human Error - Field Wiring Error, Inadequate Service Testing**

Crew on U-INBROO reported at approx 2320 Hrs on May 15, 2003 that the 0.5 signal on the Seattle Subdivision was Red then went Green with a train in the next block.

Cutover of new Spokane Street CTC equipment and interface to old equipment was accomplished on May 14, 2003. During this process a N12 battery wire was inadvertently left in the wiring, and was not found during checkout. This allowed N12 and B12 to the SA mech of signal 0.5 when they should not have been causing the mech to poll to a Green aspect.

This N12 wire was removed and the signal system tested and then returned to service at 0350 Hrs PT on May 16, 2003.

<b>382</b>	6/11/2003	BNSF	CTC			ZWSPLAC408A	Cable	San Bernardino, CA	N
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**Human Error - Field Wiring Error, Inadequate Service Testing**

Signal gang replaced cable between the main control house and the westbound control signals at Verdemon. The conductors in the cable for the control circuit of bottom head on the #1 main track westbound signal were hooked up incorrectly, causing a false proceed signal.

<b>383</b>	7/13/2003	BNSF	CTC			X GATRED9 13	None	Somerville, TX	N
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**Phantom Signal - Due to Object in Foreground or Background**

As a northbound train was departing the yard at North Somerville Yard control point. A second northbound train, the X GATRED9-13 approached the control point on the mainline from the south. The northbound train on the mainline was to follow the northbound train departing the yard. The mainline train received a Yellow aspect at the approach signal and a Red aspect at the absolute NB mainline signal at North Somerville Yard control point. While stopped, and as the train departing the yard was occupying the OS track circuit, the engineer on the mainline train glanced up at the absolute NB mainline signal and noticed that it appeared to be displaying a Yellow aspect. The engineer reported the occurrence to the dispatching center, however, did not take the signal.

Signal and Operating Department personnel were dispatched to investigate and determined that the signal system was working as intended. It was found that light colored rock (white marble/limestone), recently spread on an access road adjacent to the absolute NB mainline signal, reflected sunlight into the H2 signal head causing the Red aspect to appear Yellow when viewed from the locomotive. The investigation team further verified the cause to be reflected sunlight when the aspect was observed Red with the sun behind the clouds and Yellow when the sun came out from behind the clouds.

The phantom signal was resolved by removing the white rock and replacing it with darker colored rock (absorbs, not reflects sunlight). In addition, ...

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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<b>384</b>	7/14/2003	BNSF	AB			Q-ALTRIC1-11A	Signal 11551	Pittsburg, CA	N
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**Human Error - Signal Circuit Design Error, Inadequate Service-Testing**

Signal 11551 at East Pittsburg displayed Green approach into Signal 11571 Red, against switch 1157.05 reverse at West Pittsburg.

Found that WBP (west block repeater) relay at West Pittsburg, which served as the pole changer for 11551 (1R) block circuit, was not checked by the WNP (switch normal repeater) and thus remained energized. With switch fully reversed, a reverse contact on the switch circuit controller allows for the 1R block to remain energized to permit an APPROACH aspect.

The last changes that created this situation were put in service on August 7, 1997.

A revised circuit change was furnished, implemented and tested on July 14, 2003. The 19BP (19 block repeater) now serves as the pole changer and is qualified by both the WBP and WNP energized.

<b>385</b>	8/26/2003	BNSF	AB	Remote		ZCHCSSE124	Hand Throw Switch MP 4.05, Main 1 SB	ARGO Interlocking, Seattle, WA	N
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**Human Error - Signal Circuit Design Error, Inadequate Service-Testing**

Train crew on the ZCHCSSE124 reports that they had a Yellow signal southbound Main 1 at ARGO Interlocking and then found the hand throw Airport Way Switch at MP 4.05X in the open position. This was reported at about 1950 hrs PT on August 26, 2003.

Main 1 south of the ARGO Interlocking was taken out of service with notification to the Signal Department at about 2015 hrs PT. Tests were conducted and the Yellow signal was confirmed with the New Airport Hand Throw Switch open, when the Main 1 southbound signal should have been at Red.

Switch was removed from service, tagged and clamped awaiting signal circuit changes. Changes to the 2-3 WD1 and the N2-3 WD1 were accomplished on August 28, 2003 and all required and necessary tests were made and switch was placed back in service.

<b>386</b>	9/29/2003	BNSF	CTC	Remote		ZALTSBD227	Design Error	Belen, NM	N
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**Human Error - Signal Circuit Design Error, Inadequate Service-Testing**

Westbound train Z-ALTSBD2-27 reported to Road Foreman they had a Red over Flashing Yellow at El Paso Jct. into a Red over Red at Belen Jct. on September 28, 2003. Road Foreman left voice mail for Signal Supervisor, who didn't receive voice mail until September 29, 2003. Signal Supervisor investigated and found when 6WA signal at Belen Jct. (coming off Main 6) cleared it picked the 4WBMR which allowed a R/FY on the 4WAB signal (lined main 2 to main 8) at El Paso Jct. into a Red at Belen Jct. (on main 8).

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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<b>387</b>	9/30/2003	BNSF	CTC			L-NWE823130	CL	Everett, Washington	N
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**Cause**

**Narrative**

Phantom Signal - Due to Sun Angle

At approximately 16:05 PDT on 10-30-03, train L-NWE823130 while traveling north on main 2 ran by a red signal displaying Red over Red at Everett Jct. The train was traveling in reverse with a caboose in the lead. The crew thought they saw a Yellow over Yellow signal and found the switch lined against them in the OS section of Everett Jct. The train stopped before they ran through the switch.

The signal team was notified and all logs were downloaded and revealed that the signal was Red over Red when the train entered the OS section at Everett Jct. Further investigation by the signal team revealed lamp voltage was lower than standard by about a 1/2 volt. They also found that the signal alignment was poor. The following day, 10/1/03, the signal team along with the operating team recreated the incident at the same time of day with the same conditions. Lamp voltage was reduced to the levels of the previous day and the train proceeded north. They viewed the signal as they proceeded north taking pictures along the way. Although the pictures clearly show the signals being Red, they thought they could see a phantom aspect of Yellow over Yellow. The weather conditions were bright afternoon sun.

The repairs were that the signal was re-aligned and lamp voltages raised to BNSF standard.

<b>388</b>	10/21/2003	BNSF	CTC			Q LACAUG 618	None Found	Estelline, TX	N
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**Scenario Reenacted, Unable to Duplicate, No Defects Found**

Dispatcher reported two EB trains at East Estelline. The 1st EB train had a Red signal at E. Estelline and was talked by the signal. The 2nd train also had a Red signal at E. Estelline and was being talked by the signal when the signal went Green. The 1st EB train advised the 2nd EB train that the signal at E. Estelline should not be Green because the rear of their train just passed the approach signal at MP 233.6. The signal at E. Estelline for the 2nd EB train should have been Yellow.

After extensive testing, the alleged false proceed could not be duplicated. After consultation with BNSF Signal Engineering and GE Global Signaling (coded track equipment manufacturer) it was decided to change out the coded track systems at both the intermediate signal 233.6 and E. Estelline. In addition, a recorder was installed at intermediate signal 233.6 and a 216DL recorder module inserted into the newly installed Electrocode 4H at E. Estelline. Operating Department personnel and the engineers on both trains are aware of our pending results and remedial actions.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			<b>Cause</b>							
			<b>Narrative</b>							
<b>390</b>	12/29/2003	BNSF	AB			Y-HUT-1011-29	Signal Circuit Design	Hutchinson, KS	N	
			<b>Human Error - Signal Circuit Design Error, Inadequate Service-Testing</b>							
			<p>The local, working between Dodge City KS &amp; Newton KS noticed intermediate signal 2221 displayed a CLEAR aspect while the track circuit was occupied. Upon report, the signal system between stations was removed from service and signal personnel were dispatched to the area. Signal personnel confirmed this aspect and proceeded to test circuitry. During testing it was noted that although the track relay de-energized with a .06 shunt the signal still displayed PROCEED. Tests were then made to determine why this did not show up during in-service testing in 1996. It was determined that this was a center feed track circuit with the relay on the west end of the circuit containing a line break but the relay on the east end did not. The track circuit was walked and several broken bonds were discovered between the east track relay and the battery feed point. A shunt placed between east track relay and the battery feed point would deenergize only the east track relay. After replacing the bonds a shunt anywhere in the circuit would de-energize both track relays in this circuit. After consulting the engineering office a break of the line circuits was installed in the west track relay at intermediate signal 2221 and test were made de-energizing either relay of this circuit would set the signals governing movement over this track circuit to STOP. Root cause was an improper design with the in-service testing procedure being inadequate to determine the design error.</p>							
<b>391</b>	12/29/2003	BNSF	CTC					East Victorville	N	
			<b>Human Error - Signal Circuit Design Error, Inadequate Service-Testing</b>							
			<p>General Order to remove signals not conforming to rule 9.1.11 was removed on the Cajon Subdivision. The East Victorville signals had been due to be converted in a cutover planned earlier in the year but has been re-scheduled several times due to train traffic volumes. When Signal Supervisor completed spreadsheets to a master list this location was shown as completed but had not yet been done. Red over Flashing Yellow aspects were converted to Red over Yellow and routes were tested and system returned to service.</p>							
<b>430</b>	1/24/2004	BNSF				P-LACCHF1-23C	2E Signal	Perea, NM		

No. of Reports Shown in this Listing: **126**